MAPPING, ANALYSIS AND STUDY OF SUBJECT MATTER TO HARMONIZE THE CURRICULUM OF THE TECHNICAL STREAM OF SCHOOL LEVEL (GRADE 9-12) AND PRE-DIPLOMA AND DIPLOMA LEVEL UNDER CTEVT

Study Report

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Counsel & Counsel Pvt Ltd

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Mapping, Analysis and Study of Subject Matter to Harmonize the Curriculum of the Technical Stream of School Level (Grade 9-12) and Pre-Diploma and Diploma Level Under CTEVT

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We express our heartfelt gratitude to the leadership, officials, and experts of the Curriculum Development Centre (CDC) for their continued guidance, collaboration, and support throughout the research process.

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We are also deeply grateful to all stakeholders, participants, and subject experts who generously shared their time, perspectives, and experiences. Your contributions have significantly enriched this report and illuminated critical aspects of the two curricula (technical stream 9-12 curriculum of CDC and Pre-diploma/Diploma curriculum of CTEVT).

We hope this study will serve as a valuable resource for policy development and curricular reform aimed at improving the technical education in schools across Nepal.

Thank you to everyone involved.

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Full Form
CAD	Computer Aided Design
CDC	Curriculum Development Centre
CEHRD	Center for Education and Human Resource Development
CTEVT	Council for Technical Education and Vocational Training
EDCU	Education Development and Coordination Unit
FGD	Focus Group Discussion
FSS	Farmer Field School
KII	Key Informant Interview
MoEST	Ministry of Education, Science and Technology
NEB	National Examination Board
NCF	National Curriculum Framework
NTFP	Non-Timber Forest Products
OJT	On-the-Job Training
SWOC	Strengths, Weaknesses, Opportunities and Challenges
TECS	Technical Education in Community School
TEVT	Technical and Vocational Education and Training
TOR	Terms of Reference

EXECUTIVE SUMMARY

In Nepal, technical education is delivered through two separate institutional arrangements: the Curriculum Development Centre (CDC) implements the technical stream for grades 9–12 in schools, while the Council for Technical Education and Vocational Training (CTEVT) offers pre-diploma and diploma programs. Given the overlapping objectives and target groups, harmonizing the curriculum content between these two streams is essential to ensure coherence, reduce redundancy, and facilitate smooth student progression. This study was conducted to examine the alignment of curriculum content between the CDC technical stream and CTEVT programs, with the aim of informing future policy and practice in Nepal's technical education sector.

The research employed a qualitative desk review of curricula from both streams, complemented by extensive stakeholder consultations across all seven provinces. A total of 26 schools representing diverse resource levels and programs were selected for field visits. Data were collected through interviews and focus group discussions with headteachers, teachers, students, parents, School Management Committees, and Local Education Officers. Key stakeholders from CDC, CEHRD, and CTEVT were also consulted to validate findings.

The study found that while the overall curriculum content between CDC and CTEVT is generally aligned in purpose and goals, differences exist in content sequencing, presentation, and coherence. Most schools expressed satisfaction with the curricula but highlighted challenges in effective implementation, largely due to inadequate monitoring, resource constraints, and high teacher turnover. Teachers generally viewed the curriculum positively but noted that some courses are too challenging for students with limited academic backgrounds, contributing to dropout rates and student shifts to the general education stream. Some specific findings are outlined below:

Gaps, overlaps and inconsistencies related findings

1. **Content Sequencing and Progression Issues**

- **Illogical Sequencing:** In some subjects, foundational contents are placed in higher grades while complex topics appear earlier (e.g., EMI in Grade 11 vs. Electrical Machines in

Grade 10 in Electrical Engineering; repetitive programming basics in Grades 9,11,12 in Computer Engineering).

- **Vertical Progression Lacking:** Similar foundational content repeated under different course titles without progressive depth (e.g., repeated topics in Plant Science across grades 9-12 like seed testing, climatic factors, farm mechanization, fruit cultivation).
- **Inconsistent Difficulty Curve:** Courses sometimes become disproportionately harder without adequate foundational preparation (e.g., concerns about student preparedness in EE, CE).

2. **Significant Content Overlaps and Repetition**

- **Within Streams:** Extensive duplication of topics and practicals across different subjects and grades, particularly in **Plant Science** (e.g., seed germination tests, effect of climate, farm mechanization, fruit/vegetable cultivation covered multiple times) and **Computer Engineering** (core programming concepts repeated across C, Java, Visual Programming courses).
- **Between Streams:** While overall alignment exists, differences in presentation, sequencing, and perceived depth create inconsistencies between CDC and CTEVT curricula.

3. **Gaps in Content**
   - **Relevance Gaps:** Content not aligned with likely career paths (e.g., Electrical Engineering focuses on large industrial machines vs. needed household appliance repair; lack of modern tech like drone surveying in Civil, industrial automation in EE).
   - **Practical Skills Gaps:** Insufficient emphasis on hands-on application compared to theory across most programs (electrical, Computer, Animal Science, Civil). OJT implementation is weak across programs, somewhat better in city areas.
   - **Modern Industry Gaps:** Missing contemporary topics crucial for employability (e.g., Industrial Automation in EE; modern surveying tech in Civil; actual application development in "Web and Mobile Application" in Computer Engineering).

4. **Inconsistencies in Structure and Presentation**
   - **Course Title vs. Content Mismatches:** Titles promise skills not covered (e.g., "Web and Mobile Application Development" lacking development tasks in Computer Engineering; misspelled titles like "Data Based").
   - **Combined vs. Separate Subjects:** Logically distinct topics bundled into single courses, hindering depth (e.g., Data Structures & OOP; Digital Design & Microprocessor – Computer Engineering).
   - **Inconsistent OJT Implementation:** Lack of standardized hours, scheduling, workplace coordination, and financial support across programs and schools (Civil, Animal Science).
   - **Arbitrary Subject Placement:** Topics like earthing repeated across grades unnecessarily (Electrical Engineering), while language subjects (Nepali/English) taught redundantly in both Grades 11 & 12.

Specific Areas of Improvement Related Findings

1. **Curriculum Content**
   - **Re-sequence Subjects:** Swap EMI to Grade 10 and Electrical Machines to Grade 11 for logical progression.
   - **Consolidate & Remove Redundancy:** Eliminate repeated topics/practicals (especially Plant Science, Computer Engineering programming basics). Merge overlapping subjects (e.g., math options in Animal Science).
   - **Update & Modernize:** Remove obsolete content (e.g., plane table surveying - Civil); add critical modern topics (Industrial Automation in grades 11 or 12 in Electrical Engineering; drone tech, modern frameworks - Computer/Civil).
   - **Align Content with Career Realities:** Shift focus to relevant skills (e.g., household appliance repair in Electrical Engineering (e.g. heaters, fans, LED TVs); actual application development in Computer Engineering).
   - **Separate Combined Courses:** Split bundled topics into distinct courses for focused learning (e.g., Data Structures & OOP – Computer Engineering).

- **Rationalize General Subjects:** Reduce overload of general subjects (esp. Animal Science) to prioritize technical skills. Optimize language instruction (e.g., teach Nepali/English in only one of Grade 11/12 - Civil).
- **Clarify Titles & Content:** Ensure titles accurately reflect content and learning outcomes (Web and Mobile Application Development in Computer Engineering). Consolidate earthing content in Grade 9 and reserve lighting arresters for grade 10 (Electrical Engineering). Refocus Electrical CAD to emphasize electrical drawings only.

2. **Balance of Theory and Practical**
   - **Enhance Practical Relevance:** Ensure practicals are feasible, accessible, and industry-relevant (e.g., replace impractical Plant Science practicals; add hands-on like distribution transformers handling, economic voltage calculations in Electrical Engineering).
   - **Strengthen OJT:** Standardize hours (e.g., Civil: 300hrs Grade 10, 300hrs Grade 11, 600hrs Grade 12); secure financial support; improve workplace coordination & policy; schedule effectively (avoiding exam times).
3. **Monitoring and Support**
   - Monitor the use of practical guidelines and proper implementation of the practical and project works, including OJT.
   - Provide intensive teacher support on implementing the practical components.

Based on these findings, the study makes the following recommendations to different stakeholders:

For CDC

- Address curriculum content and structure related issues identified in this study, some of these include:
  - Reorganize subject placement to ensure logical progression (e.g., EMI before Electrical Machines).
  - Eliminate repeated topics and practicals across grades and subjects (especially in Plant Science, Electrical engineering, and Computer Engineering).
  - Make the core academic subjects more applied relevant to the discipline in focus (e.g., Engineering math).

- Introduce modern, career-relevant topics (e.g., Industrial Automation, drone technology, application development frameworks)
- Ensure course titles reflect actual content and learning outcomes (e.g., revise "Web and Mobile Application Development")
- For OJT, standardize hours (e.g., 300hrs Grade 10, 300hrs Grade 11, 600hrs Grade 12) and tentative calendar months so as to facilitate having similar program structure across schools; ensure program completion within 3 months of Grade 12 examination. This may require some course adjustment in grade 10 and 11 to allow at least 6 months window for OJT within grade 12.

* Replace impractical exercises with accessible, industry-relevant alternatives or provide schools with guidelines on adapting the practical exercises to fit their context.
* Provide structured micro-syllabi to guide teaching and assessment.
* Regularly evaluate curriculum delivery and monitor practical implementation, including OJT.

For CTEVT

- While maintaining strong practical training, reinforce foundational scientific and theoretical concepts in a balanced way to support lifelong learning and adaptability.
- Expand partnerships with industries to improve internships, on-the-job training (OJT), and employment pathways for graduates.
- Integrate subjects like Social Studies to develop graduates who are not only technically skilled but also socially responsible.

For Both CDC and CTEVT

- Align curriculum content and learning outcomes to reduce redundancy and support smooth student transitions.
- Jointly conduct a thorough program mapping and consider program re-distribution based on changing market needs (feasibility).

For Ministry of Education, Science and Technology

- Establish unified governance for technical education programs, allocate sufficient resources to improve infrastructure and human capacity, and conduct research on streamlining technical education possibly through a single stream at the school level.

For Provincial Governments

- Promote coordination between CDC- and CTEVT-affiliated institutions in the province to ensure curricular coherence and relevance across technical stream and CTEVT programs.
- To assess and map the distribution of technical education programs in alignment with provincial labor market needs, and to coordinate with the CDC and CTEVT for the rational redistribution and alignment of programs within the provinces.

For Local Governments

- Facilitate industry collaboration with educational institutions, monitor program quality, and promote community awareness of the benefits of technical education.

For Schools

- Address teacher turnover through improved recruitment and training, and maximize practical learning opportunities.

कार्यकारी सारांश

नेपालमा प्राविधिक शिक्षा विशेषत दुई फरक संस्थागत व्यवस्थामार्फत प्रदान गरिँदै आएको छ। पाठ्यक्रम विकास केन्द्र (सीडीसी) ले विकास गरेको पाठ्यक्रम अनुसार विद्यालयस्तरमा कक्षा ९ देखि १२ सम्मका लागि प्राविधिक धार सञ्चालन भइरहेकोछ भने प्राविधिक शिक्षा तथा व्यावसायिक तालिम परिषद् (सीटीईभीटी) ले पूर्व-डिप्लोमा र डिप्लोमा स्तरका कार्यक्रमहरू सञ्चालन गर्दै आएको छ। यी दुई कार्यक्रम बिच उद्देश्य र लक्षित समूहहरू समान हुने भएकाले पाठ्यक्रमका विषयबस्तुमा समन्वय गर्न आवश्यक छ। यसबाट विषयवस्तुमा स्पष्टता कायम गर्न, दोहोरिने सामग्री घटाउन र विद्यार्थीको सहज प्रगति सुनिश्चित गर्न सकिन्छ। यस अध्ययनको उद्देश्य नेपालको प्राविधिक शिक्षा क्षेत्रमा भावी नीतिगत तथा व्यावहारिक सुधारमा सहयोग पुगोस् भनी सामुदायिक विद्यालयमा सञ्चालित प्राविधिक धार र सिटिइभिटीका कार्यक्रमबिचको पाठ्यक्रमभित्रको विषयवस्तुको सामान्जस्यताको विश्लेषण गर्नु थियो।

यस अनुसन्धानमा दुवै कार्यक्रमका पाठ्यक्रमहरूको गुणात्मक डेस्क रिभ्यु गरिएको थियो भने सातै प्रदेशमा विविध सरोकारवालासँग परामर्शसमेत गरिएको थियो। स्रोतको उपलब्धता र कार्यक्रमको विविधतालाई समेट्ने गरी २६ ओटा विद्यालयहरू छनोट गरी क्षेत्रगत भ्रमण समेत गरिएको थियो। प्रधानाध्यापक, शिक्षक, विद्यार्थी, अभिभावक, विद्यालय व्यवस्थापन समिति र स्थानीय शिक्षा अधिकारीहरूसँग अन्तर्वार्ता र लक्षित समूह छलफलमार्फत तथ्याङ्क सङ्कलन गरिएको थियो। साथै पाठ्यक्रम विकास केन्द्र, शिक्षा तथा मानव स्रोत विकास केन्द्र र प्राविधिक शिक्षा तथा व्यवसायिक तालिम परिषद्का प्रमुख सरोकारवालासँग समेत परामर्श गरिएको थियो।

यस अध्ययनले के देखाएको छ भने पाठ्यक्रम विकास केन्द्र र सिटिइभिटीको पाठ्यक्रम उद्देश्य र लक्ष्यका हिसाबले सामान्य रूपमा मिल्दोजुल्दो भए तापनि सामग्रीको क्रमबद्धता, प्रस्तुति शैली र अन्तरसम्बन्धमा केहि भिन्नता छ। अधिकांश विद्यालयका सरोकारवालाहरूले पाठ्यक्रमप्रति सन्तुष्टि व्यक्त गरे तापनि प्रभावकारी कार्यान्वयनमा चुनौतीहरू रहेको उल्लेख गरे। यसको प्रमुख कारणमा पर्याप्त अनुगमनको अभाव, स्रोतको कमी र शिक्षकहरूको उच्च स्थानान्तरण दर रहेका छन्। शिक्षकहरूले पाठ्यक्रमलाई सकारात्मक रूपमा लिएका भए पनि केही पाठ्यक्रमहरू कमजोर शैक्षिक पृष्ठभूमि भएका विद्यार्थीहरूका लागि अत्याधिक चुनौतीपूर्ण रहेका छन्। त्यसले गर्दा विद्यार्थीहरू विद्यालय छोड्ने वा साधारण शिक्षातर्फ फर्कने अवस्था सिर्जना भएको समेत पाइएको छ।

यस अध्ययनका केही विशेष निष्कर्षहरू निम्नअनुसार छन् :

अन्तर, दोहोरोपना र असङ्गतिसँग सम्बन्धित निष्कर्षहरू

१. विषयवस्तुको अनुक्रम र प्रगति सम्वन्धि समस्याहरू

- **अतार्किक क्रमबद्धता:** केही विषयहरूमा आधारभूत विषयहरूबस्तु माथिल्लो कक्षामा राखिएका छन् भने जटिल विषयहरूबस्तु तल्लो कक्षामा राखिएका छन् (जस्तैः इलेक्ट्रिकल इन्जिनियरिङमा कक्षा ११ मा EMI र कक्षा १० मा Electrical Machines; कम्प्युटर इन्जिनियरिङमा कक्षा ९, ११ र १२ मा programming basics बारम्बार दोहोरिएको)।

- **क्रमिक प्रगतिको अभाव: केहि विषयहरुमा** उही आधारभूत विषयवस्तुहरू विभिन्न शीर्षकमा दोहोरिने तर क्रमिक गहिराइ नदेखिने (जस्तैः बाली विज्ञानमा कक्षा ९–१२ सम्म एउटै विषयवस्तुहरू जस्तै बिउ परीक्षण, मौसमीय प्रभाव, कृषि यान्त्रिकीकरण, फलफूल खेती निरन्तर तार्किक गहिराइ विनै दोहोरिएको)।
- **असङ्गत कठिनाइ स्तर:** विशेष गरि कक्षा ९ का इलेक्ट्रिकल इन्जिनियरिङ र कम्प्युटर इन्जिनियरिङमा तल्ला कक्षाहरूमा दिइनुपर्ने आधारभूत ज्ञान तथा सिप विनै जटिल विषयवस्तुहरू समावेश भएका छन्।
- **विषयवस्तुको दोहोरोपना:** विभिन्न विषय र कक्षाहरूमा विषयहरू र प्रयोगात्मक अभ्यासहरू व्यापक दोहोरिने, विशेष गरी वनस्पति विज्ञानमा (जस्तैः बिउ अङ्कुरण परीक्षण, जलवायुको प्रभाव, कृषि यान्त्रिकीकरण, फलफूल र तरकारी खेती धैरै पटक समेटिएको) र कम्प्युटर इन्जिनियरिङमा कोर प्रोग्रामिङ अवधारणाहरू (सी, जाभा तथा भिजुअल प्रोग्रामिङ जस्ता विषयवस्तुहरू) दोहोरिएको अवस्था रहेको पाइयो।

२. पाठ्यक्रम सामग्रीमा फरकपना

- **प्रासङ्गिकताको कमी:** पाठ्यक्रमका कतिपय विषयबस्तुहरू सम्भावित रोजगारीसँग मेल नखाने (जस्तैः इलेक्ट्रिकल इञ्जिनियरिङमा ठुला औद्योगिक मेसिनहरूमा बढी ध्यान दिइएको तर घरायसी उपकरण मर्मत आवश्यकतालाई सम्बोधन नगर्ने; सिभिल इन्जिनियरिङमा ड्रोन सर्भेइङ, इलेक्ट्रिकल इञ्जिनियरिङमा औद्योगिक अटोमेसन नसमेटिएको)।
- **व्यावहारिक सिपको कमी:** अधिकांश कार्यक्रममा सैद्धान्तिक पक्षमा बढी बल दिइएकोतर व्यावहारिक अभ्यासमा कमजोर (जस्तैः इलेक्ट्रिकल, कम्प्युटर, पशु विज्ञान, सिभिल); OJT कार्यान्वयन सबै कार्यक्रममा कमजोर रहेको तर सहरी क्षेत्रमा भने केही राम्रो अवस्था रहेको।
- **आधुनिक उद्योगसँग सामञ्जस्यताको अभाव:** आधुनिक रोजगारीका लागि आवश्यक समसामयिक विषयहरू छुटेका छन् (जस्तैः इलेक्ट्रिकल इञ्जिनियरिङमा औद्योगिक अटोमेसन, सिभिलमा आधुनिक सर्भेइङ प्रविधि, कम्प्युटर इन्जिनियरिङको “Web and Mobile Application” मा वास्तविक एप विकासको अभ्यासको अभाव) ।

३. संरचना र प्रस्तुतीकरणमा असङ्गतिहरू

- **विषय शीर्षक र विषयवस्तुबिच बेमेल:** शीर्षकले दिने आशय र सामग्री नमिल्ने (जस्तैः कम्प्युटर इन्जिनियरिङमा “Web and Mobile Application Development” मा Application Development को कार्य नभएको; "Data Based" जस्तो शीर्षकमा गलत हिज्जे)।
- **सम्बद्ध/असम्बद्ध विषयको एकीकरण:**पृथक् विषयहरू एउटै कोर्समा राख्दा गहिराइ अभाव (जस्तैः Data Structures र OOP; Digital Design र Microprocessor – कम्प्युटर इन्जिनियरिङ)।
- **OJT कार्यान्वयनमा असमानता:** समय (कार्यघण्टा) निर्धारण, कार्यतालिका मिलान, कार्यस्थल समन्वय र आर्थिक सहयोगमा एकरूपता छैन। जसले गर्दा कार्यान्वयनमा असमानता देखिन्छ।

सुधारका विशिष्ट क्षेत्रहरूसँग सम्बन्धित निष्कर्षहरू

१. पाठ्यक्रम सामग्री र संरचना

- **विषयहरूको पुनःअनुक्रमण गर्ने**: इलेक्ट्रिकल इन्जिनियरिङ कार्यक्रममा सामान्य देखि जटिलको तार्किक क्रम मिलाउनका लागि कक्षा १० को Electrical Machine लाई कक्षा ११ मा तथा कक्षा ११ मा भएको Electrical Measurement and Instruments लाइ कक्षा १० मा राख्दा उपयुक्त हुने ।
- **दोहोरिएको सामग्री हटाउने र मिलाउने**: दोहोरिएका विषय र प्रयोगहरू हटाउने (विशेष गरी बाली विज्ञान, कम्प्युटर इन्जिनियरिङमा प्रोग्रामिङका आधारभूत अवधारणाहरू) । मिल्दाजुल्दा विषयहरूलाई गाभ्ने (जस्तैः पशुविज्ञानमा अनिवार्य र ऐच्छिक गणितका विषयहरू, कम्प्युटर विज्ञान कार्यक्रममा, प्रोग्रामिङका तीन विषयलाई दुईमा गाभ्न सकिन्छ) ।
- **विषयवस्तु अद्यावधिकगर्ने :** पुराना विषयवस्तु हटाउने (जसस्तैः सिभिलमा प्लेन टेबल सर्वेक्षण) र महत्त्वपूर्ण आधुनिक विषयहरू समावेश गर्ने (जस्तैः इलेक्ट्रिकल इन्जिनियरिङको कक्षा ११ वा १२ मा औद्योगिक स्वचालन, ड्रोन प्रविधि, आधुनिक सफ्टवेयर फ्रेमवर्क कम्प्युटर/सिभिल) ।
- **वास्तविक करियरसँग मेल हुने सामग्री समावेश:** रोजगारसम्बन्धी सिपहरूमा जोड दिने (जस्तैः इलेक्ट्रिकल इन्जिनियरिङमा घरायसी उपकरण मर्मत – हिटर, पङ्खा, लेड टिभी आदि; कम्प्युटर इन्जिनियरिङमा वास्तविक एप विकास) ।
- **संयुक्त विषयहरू अलग गर्ने** : केहि विषयहरुमा गाभिएका विषयबस्तुहरुलाई अलग्गै विषयहरुमा विभाजन गर्नुपर्ने आवश्यकता छ **(**जस्तैः कम्प्युटर इन्जिनियरिङमा डेटा संरचना र ओओपी **)** ।
- **सामान्य विषयहरूको युक्तीकरण:** प्राविधिक सिपलाई प्राथमिकता दिन प्राविधिक धारमा सामान्य अनिवार्य शैक्षिक विषयहरू घटाउनुपर्ने । त्यस्तै भाषा शिक्षणलाई अनुकूल बनाउने (जस्तैः नेपाली/अङ्ग्रेजी कक्षा ११ वा १२ मध्ये एउटामा मात्र राख्ने) ।
- **शीर्षक र सामग्री स्पष्ट पार्ने:** कोर्सको शीर्षकले यसको वास्तविक सामग्री र सिकाइको परिणाम स्पष्ट झल्काउने सुनिश्चित गर्ने (जस्तैः कम्प्युटर इन्जिनियरिङको *Web and Mobile Application Development*)। इलेक्ट्रिकल इन्जिनियरिङमा Earthing कक्षा ९ मा समेट्ने र lightning arrester कक्षा १० मा राख्ने । *Electrical CAD* लाई केवल इलेक्ट्रिकल ड्रइङमा केन्द्रित गर्ने ।

२. सैद्धान्तिक र व्यावहारिक पक्षको सन्तुलन

- **व्यावहारिक क्रियाकलापहरूको सान्दर्भिकता बढाउने:** व्यावहारिक अभ्यासहरू यथार्थपरक, सहज र उद्योगसँग मेल खाने बनाउने (जस्तैः बाली विज्ञानमा अव्यावहारिक प्रयोगहरू हटाउने; इलेक्ट्रिकल इन्जिनियरिङमा वितरण ट्रान्सफर्मर ह्यान्डलिङ, आर्थिक भोल्टेज गणना जस्ता व्यावहारिक अभ्यास थप्ने ।
- **OJT बलियो बनाउने:** कार्यघण्टाको मापदण्ड तय गर्ने (जस्तैः सिभिल: कक्षा १० मा ३०० घण्टा, कक्षा ११ मा ३०० घण्टा, कक्षा १२ मा ६०० घण्टा), आर्थिक सहायता सुनिश्चित गर्ने, कार्यस्थल समन्वय तथा नीति सुधार गर्ने, परीक्षा समय नपर्ने गरी तालिका मिलाउने ।

३. अनुगमन र सहयोग

- व्यावहारिक अभ्यास तथा परियोजना कार्य (OJT समेत) को मापदण्डअनुसार कार्यान्वयन भइरहेको छ कि छैन भन्ने निगरानीर अनुगमन गर्न
- व्यावहारिक पक्ष कार्यान्वयन गर्न शिक्षकहरूलाई सघन सहयोग प्रदान गर्ने ।

यी निष्कर्षहरूका आधारमा, अध्ययनले विभिन्न सरोकारवालाहरूका लागि निम्न सिफारिसहरू प्रस्तुत गरेको छ:

पाठ्यक्रम विकास केन्द्र (CDC) का लागि

- **विषय रखाइको पुनःसंरचना गर्नुपर्ने** : विषयवस्तुहरूको तार्किक प्रगति सुनिश्चित गर्न विषयहरू पुनःक्रमबद्ध गर्ने (जस्तैः Electrical Machines भन्दा पहिले EMI राख्ने) ।
- **दोहोरिएका विषयवस्तु र प्रयोगहरू हटाउनुपर्ने** : कक्षाहरू र विषयहरूमा दोहोरिने सामग्रीहरू हटाउने (विशेष गरी बाली विज्ञान, इलेक्ट्रिकल इन्जिनियरिङ र कम्प्युटर इन्जिनियरिङ) ।
- **सैद्धान्तिक विषयहरूलाई व्यावहारिक र सान्दर्भिक बनाउने** : मुख्य शैक्षिक विषयहरूलाई लक्षित प्राविधिक अनुशासनसँग प्रत्यक्ष रूपमा सम्बन्धित बनाउने (जस्तैः गणितलाई इन्जिनियरिङ गणित बनाउने) ।
- **आधुनिक र करियरसँग सम्बन्धित विषयहरू समावेश गर्ने** : औद्योगिक स्वचालन, ड्रोन प्रविधि, एप विकास फ्रेमवर्कहरूजस्ता विषयहरू पाठ्यक्रममा समावेश **गर्ने** ।
- **विषय शीर्षक स्पष्ट र प्रासङ्गिक बनाउने**: शीर्षकले वास्तविक सामग्री र सिकाइ परिणाम प्रतिबिम्बित गर्ने सुनिश्चित गर्नुपर्ने (जस्तैः "Web and Mobile Application Development" लाई संशोधन गर्नुपर्ने)।
- **OJT का लागि घण्टा र क्यालेन्डर मापदण्ड बनाउने**: कक्षा १०-३०० घण्टा, कक्षा ११-३०० घण्टा, कक्षा १२-६०० घण्टाको मापदण्ड बनाउन
  सकिने । कक्षा १२ को परीक्षा सकिएको ३ महिनाभित्र कार्यक्रम सम्पन्न हुने गरी तालिका बनाउन सकिने । यसका लागि कक्षा १० र ११ मा केही विषयहरूलाई मिलाएर कक्षा १२ मा OJT का लागि कम्तीमा ६ महिनाको अवधि छुट्याउनुपर्ने हुन सक्छ ।
- **कम व्यावहारिक प्रयोगहरू हटाउनु वा अनुकूल बनाउनुपर्ने** : उद्योगसापेक्ष, सुलभ विकल्पहरू समावेश **गर्ने** वा विद्यालयको सन्दर्भअनुसार प्रयोगहरू अनुकूल बनाउन स्पष्ट मार्गनिर्देशन प्रदान गर्नुपर्ने ।
- **सूक्ष्म पाठ्यविवरण (micro-syllabi) तयार गरी सिकाइ र मूल्याङ्कनमा सहयोग गर्ने**
  : शिक्षण र मूल्याङ्कनको मार्गदर्शनका लागि विषयअनुसार सूक्ष्म पाठ्यविवरण उपलब्ध गराउनुपर्ने ।
- **पाठ्यक्रम कार्यान्वयनको नियमित मूल्याङ्कन र अनुगमन गर्ने** : सिकाइ कार्यान्वयन तथा व्यावहारिक अभ्यास र OJT को कार्यान्वयन अनुगमन गर्न प्रणाली तयार गर्नुपर्ने ।

प्राविधिक शिक्षा तथा व्यवसायिक तालिम परिषद्का लागि

- **सुदृढ व्यावहारिक तालिमसँगै सैद्धान्तिक पक्ष सन्तुलित बनाउने** : व्यावहारिक तालिमलाई मजबुत बनाउने कामलाई कायम राख्दै, आधारभूत वैज्ञानिक र सैद्धान्तिक अवधारणाहरूलाई समेत सन्तुलित ढङ्गले समावेश गर्नुपर्ने, जसले जीवनपर्यन्त सिकाइ र वातावरणअनुकूलता (adaptability) मा सहयोग पुर्‍याउँछ ।

- **उद्योगसँगको साझेदारी विस्तार गर्ने** : उद्योगहरूका साथ सहकार्य बढाउने, जसबाट विद्यार्थीको इन्टर्नसिप, कार्यस्थल तालिम (OJT) र स्नातकहरूका लागि रोजगारीको अवसरमा सुधार ल्याउन सकिन्छ ।
- **सामाजिक विषयहरूको समावेशीकरण गर्ने** : प्राविधिक सिपयुक्त मात्र नभई सामाजिक रूपमा जिम्मेवार र सुसंस्कृत नागरिक उत्पादन गर्न सामाजिक अध्ययन वा नागरिक शिक्षा जस्ता विषयहरूलाई पाठ्यक्रममा समावेश गर्ने ।

CDC र CTEVT दुवैका लागि

- **पाठ्यक्रम सामग्री र सिकाइ परिणामहरूलाई एकरूप बनाउने** : दोहोरिने विषयवस्तु हटाउन र विद्यार्थीहरूको सहज स्थानान्तरण (transition) सुनिश्चित गर्न CDC र CTEVT दुबैका पाठ्यक्रम का विषयबस्तु र सिकाइ परिणामहरूलाई मिलाउने ।
- **संयुक्त रूपमा कार्यक्रम नक्साङ्कन (program mapping) गर्ने** : दुवै संस्थाले मिलेर विस्तृत कार्यक्रम नक्साङ्कन गर्ने र श्रम बजारको बदलिँदो आवश्यकतालाई ध्यानमा राखी कार्यक्रमहरूको पुनःवितरण (re-distribution) गर्ने ।

शिक्षा, विज्ञान तथा प्रविधि मन्त्रालयका लागि

- **प्राविधिक** शिक्षा कार्यक्रमहरूका लागि एकीकृत प्रशासन स्थापना गर्ने, पूर्वाधार र मानव क्षमता सुधार गर्न पर्याप्त स्रोतहरू विनियोजन गर्ने र विद्यालय स्तरमा सम्भवतः एउटै धारमार्फत प्राविधिक शिक्षालाई सुव्यवस्थित गर्नेबारे अनुसन्धान गर्ने ।

प्रदेश सरकारका लागि

- **प्राविधिक धार र सीटीईभीटीअन्तर्गतका कार्यक्रमहरूबीच पाठ्यक्रमको एकरूपता र सान्दर्भिकता सुनिश्चित गर्न प्रदेश स्तरका सीडीसी र सीटीईभीटीसँग सम्बद्ध संस्थाहरूबीच समन्वय बढाउने ।**
- **प्रादेशिक श्रम बजारका आवश्यकतासँग मिल्ने गरी प्राविधिक शिक्षाका कार्यक्रमहरूको वितरणको मूल्याङ्कन र नक्साङ्कन गर्ने, साथै प्रदेशभित्रका कार्यक्रमहरूको तार्किक पुनःवितरण र मिलानका लागि सीडीसी र सीटीईभीटीसँग समन्वय गर्ने ।**

स्थानीय सरकारका लागि

- **शैक्षिक संस्थाहरूको उद्योगसँगको सहकार्यलाई** सहज बनाउने, कार्यक्रमको गुणस्तर अनुगमन गर्ने र प्राविधिक शिक्षाका फाइदाहरूका बारेमा समुदायको जागरूकता प्रवर्धन गर्ने ।

विद्यालयहरूका लागि

- प्रभावकारी नियुक्ति प्रणाली र नियमित तालिम कार्यक्रमहरूमार्फत शिक्षकको स्थायित्व कायम गर्ने र व्यावहारिक सिकाइ अवसरहरूलाई बढावा दिने ।

CHAPTER I
INTRODUCTION

Background

Technical and Vocational Education and Training (TVET) occupies a central role in Nepal's educational and economic development agenda, serving as a strategic mechanism to prepare youth with the practical skills and competencies required for national progress and participation in the global workforce. The country's commitment to advancing technical education is firmly established within its constitutional and legislative frameworks. Article 51 (h) of the Constitution of Nepal underscores education as a fundamental right, directing the state to ensure that education is scientific, technical, vocational, skill-oriented, employment-focused, and responsive to the needs of society. This constitutional mandate is further articulated in the Education Act, 2028 (1971), which designates secondary education as a pivotal stage for delivering technical and vocational skills. Complementing this, the Compulsory and Free Education Act, 2075 (2018) guarantees every citizen who completes basic education the right to pursue secondary or equivalent technical education, reinforcing the state's obligation to expand access to skill-based learning opportunities. Moreover, the constitutional foundation is operationalized by the National Education Policy (NEP) 2019, which represents a transformative shift by making TVE compulsory within secondary education (Grades 9-12) and establishing a distinct "Technical Stream" alongside Academic and Sanskrit streams in Grades 11-12 (Ministry of Education, Science and Technology, 2019). The NEP emphasizes developing market-relevant, competency-based curricula, life skills, entrepreneurship, specialized infrastructure (Technical Schools), and dedicated TVE teachers, alongside industry linkages and practical assessment, aiming to overcome societal stigma towards vocational paths.

The National Curriculum Framework, 2076, provides a dynamic blueprint for curriculum development, emphasizing ongoing evaluation and adaptation to meet the demands of a knowledge-driven society and a rapidly evolving global context. The Curriculum Development Centre (CDC) is entrusted with the responsibility of ensuring that curricula remain contemporary, contextually relevant, and practically oriented, incorporating advancements in information technology and responding to academic, social, cultural, political, and economic shifts. In parallel, the Council for Technical Education and Vocational Training (CTEVT) develops competency-based curricula for its pre-diploma and diploma programs, ensuring alignment with occupational standards and labor market requirements.

At the secondary education level, Nepal operates two parallel streams of technical education:

- **Pre-Diploma and Diploma Level (CTEVT):** Established in 1989, CTEVT serves as Nepal's apex institution for technical and vocational education. It administers pre-diploma (Technical School Leaving Certificate, TSLC) and diploma programs through a nationwide network of affiliated institutions. These programs are designed to produce skilled professionals for sectors such as engineering, health, agriculture, and hospitality, and are closely aligned with current labor market needs.
- **Technical Stream in Grades 9–12 (CDC):** Managed by the CDC, this stream integrates technical and vocational education into the secondary school curriculum, beginning at grade 9. The National Curriculum Framework, 2076, delineates secondary education as encompassing grades 9–12, with three distinct pathways: general, traditional, and technical/vocational. The Technical and Vocational Education in Schools Directive, 2069, mandates the initiation of technical and vocational education from grade 9, with the CDC responsible for continuous research, evaluation, and curriculum updates to ensure quality and relevance. As of recent data, 537 technical and vocational secondary education programs are in operation, spanning disciplines such as agricultural science, civil engineering, computer engineering, animal science, and electrical engineering, and are supported by government grants.

The expansion of technical education within schools was propelled by the imperative to broaden access for target groups that CTEVT alone could not accommodate, thereby promoting social justice and equitable opportunities. This objective is reflected in the School Sector Reform Plan (SSRP) and the School Sector Development Plan (SSDP). In 2070 BS, the Ministry of Education initiated pilot technical and vocational streams in 100 secondary schools, each offering a distinct stream. This initiative has since grown, with 537 schools now authorized to deliver technical and vocational programs, underpinned by government support and policy reforms.

Building upon this mandate, the School Education Sector Plan (SESP) 2022/23-2031/32 provides a concrete, ambitious 10-year implementation blueprint. Its central goal is to enroll 30% of secondary students in the Technical Stream by 2032, a significant increase from current levels (Ministry of Education, Science and Technology, 2022). To realize this, the SESP outlines key strategies such as pragmatic school zoning to cluster technical schools, extensive curriculum reform for Grades 9–12, large-scale recruitment and training of specialized TVE teachers, and substantial investment in equipping schools with workshops and laboratories. The plan also emphasizes diversified financing models, equitable access, multi-level governance coordination, and clear pathways for students to transition into further education and employment. However, the SESP acknowledges that achieving these transformative goals requires overcoming significant challenges. These include addressing severe deficits in infrastructure and teacher capacity, accelerating the development of relevant and practical curricula, fostering genuine engagement with industry partners, and strengthening monitoring systems. Moreover, shifting societal perceptions about technical education remains a critical hurdle. The plan commits to reviewing and modifying the form, structure, standards, and curriculum of the technical stream to ensure it is aligned with labor market needs and international best practices. By 2030, it aims to assess and strengthen the capacity to deliver qualitative, relevant, and demand-driven technical education at the secondary level, harmonizing these programs with those run by CTEVT. Overall, the SESP underscores the urgent need for comprehensive curriculum and program reforms to make technical education more practical, inclusive, and effective in preparing Nepalese youth for meaningful careers in a changing economic landscape.

The Sixteenth Periodic Plan (2024/25–2028/29) underscores the urgent need to reform Nepal's technical education curriculum and programs to better align with evolving market demands. Recognizing that skill development must begin early, the plan advocates for integrating technical education from the school level, tailored to students' individual abilities and interests. It stresses that technical education should be practical, life-relevant, and responsive to both national and international employment opportunities. To achieve this, the plan calls for transformative strategies including strengthening institutional capacity, promoting entrepreneurship and self-employment, and delivering job- and technology-oriented training in close collaboration with the private sector. Central to these efforts is the revision of curricula to ensure they are dynamic, skill-focused, and industry-relevant. Furthermore, the plan envisions a significant shift in educational priorities by gradually increasing the number of students pursuing technical streams compared to general education, aiming for a 70:30 ratio at the higher education level within five years. This ambitious target reflects the growing recognition of technical education as a key driver of economic growth and employment. To support these changes, the plan also proposes restructuring the Technical and Vocational Education Council to better fit Nepal's federal system, ensuring more effective governance and oversight. Overall, the Sixteenth Plan highlights that curriculum reform is not just necessary but foundational to producing skilled, employable graduates who can meet the challenges of a rapidly changing economic landscape.

Despite these advances, challenges remain in harmonizing the content and quality of technical education between the CDC and CTEVT streams. Key issues include:

- Achieving consistency and equivalence in curriculum standards
- Addressing resource limitations, such as funding, infrastructure, and qualified personnel
- Enhancing coordination to facilitate student mobility and mutual recognition of qualifications
- Bridging the gap between educational offerings and labor market demands to improve graduate employability

The need for a comprehensive comparison between the curricula of the CDC technical stream (grades 9–12) and the pre-diploma and diploma programs of the CTEVT arises from Nepal's dual-pathway approach to technical education. While both streams aim to develop skilled human resources aligned with labor market demands, they operate under different institutional frameworks, curriculum development processes, and pedagogical modalities. Given CTEVT's systematic, competency-based curriculum design that integrates industry input and continuous review to maintain relevance and employability (Adhikari, 2023; Baral & Paudel, 2025), and CDC's role in embedding technical education within the school system with its own curriculum framework and evaluation mechanisms, it is essential to map and analyze their curricular contents for alignment. Such alignment ensures coherence, avoids duplication or gaps, and facilitates smoother student transitions between educational streams, thereby strengthening the overall TVET system. Moreover, harmonizing these curricula supports national strategic goals to consolidate and integrate TVET delivery, optimize resource use, and enhance the quality and relevance of technical education for Nepal's socio-economic development (TVET Sector Strategic Plan 2023-2032). Without this comparative analysis, disparities in course content, sequencing, and learning outcomes may persist, limiting the effectiveness of TVET in meeting both learners' needs and labor market expectations.

The National Curriculum Framework, 2076, incorporates robust provisions for research and curriculum evaluation. The CDC conducts regular research and evaluation activities to inform curriculum development, implementation, and revision, ensuring that educational content remains relevant to the evolving needs of society and the global environment.

Within this context, the present study was conducted to examine the alignment of curriculum content between the technical stream at the school level (grades 9–12) and the pre-diploma/diploma level under CTEVT, with a view to informing future policy and practice in technical education in Nepal.

Objectives

The primary objective of this study was to map and analyze the curricular content to ensure alignment between the technical stream at the school level (grades 9–12) and the pre-diploma level programs offered by CTEVT. The specific objectives of the assignments were as following:

- To evaluate and analyze the existing curriculum of both the technical stream at the school level (grades 9-12) and the pre-diploma and Diploma levels of CTEVT to identify any gaps, overlaps, or inconsistencies in the content.
- To identify specific areas for improvement in the contents of the curriculum of both the technical stream at the school level (grades 9-12) and the pre-diploma and Diploma levels of CTEVT.
- To make evidence-based recommendations for enhancing the alignment in the curriculum between the technical stream at the school level (grades 9-12) and the pre-diploma and Diploma levels of CTEVT.

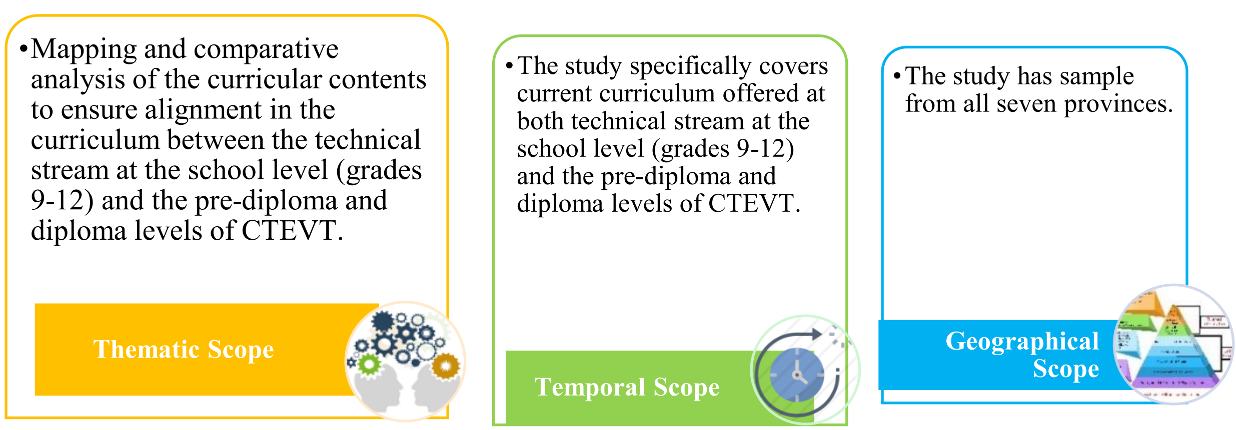
Guiding Research Questions

- What are the key content areas covered in the technical stream curriculum at the school level (Grades 9-12) and in the pre-diploma and diploma curricula of CTEVT?
- Where do gaps, overlaps, or inconsistencies exist between the content of the school-level technical stream and CTEVT programs?
- Which specific subjects or topics show misalignment or redundancy across the two curricula?
- What are the stakeholders' perceptions (teachers, curriculum developers, students) regarding content relevance and continuity between the two educational levels?
- What improvements can be made to the content sequencing, depth, or scope to enhance coherence and progression?
- What evidence-based strategies or best practices can be recommended to harmonize the content and improve alignment between the two curricula?
- How can the alignment of the curriculum between the school-level technical stream and the pre-diploma and Diploma levels of CTEVT support better student progression and preparedness for further education or employment?

Scope of Work

Based on the TOR, we conceptualized the scope of this research at three levels – thematic, temporal and geographical – as outlined below.

Figure 1: Scope of Work



As such, thematically, this study focused on the mapping and comparative analysis of curricular content to assess and ensure alignment between the technical stream at the school level (grades 9–12) and the pre-diploma and diploma programs offered by CTEVT. Methodologically, the research was primarily desk-based, involving comprehensive review and analysis of existing curricula documents. This was supplemented by qualitative insights gathered through interviews with key stakeholders involved in curriculum development and implementation. The study encompassed a detailed examination of the current curricula delivered in both the technical stream at the school level and the pre-diploma and diploma levels of CTEVT, aiming to identify areas of convergence and divergence to inform recommendations for harmonization.

Although this research primarily focuses on content alignment between the CDC and CTEVT curricula, it also explores stakeholder experiences and insights regarding the overall effectiveness of the programs. This broader perspective aims to inform and support ongoing reforms within Nepal's technical education system, ensuring that curriculum improvements translate into enhanced learning outcomes and better alignment with labor market needs.

Content Harmonization in Curriculum

Curriculum harmonization involves aligning the content, learning objectives, and assessments across different educational programs to ensure coherence and continuity in student learning experiences. Curriculum mapping is a key tool in this process, providing a systematic way to compare and analyze the content coverage, skills development, and learning outcomes of two or more curricula (Jacobs & Johnson, 2009). It helps identify gaps, redundancies, and overlaps, facilitating the adjustment of curricula to improve progression and reduce learning discontinuities (Kapucu, 2016). Effective curriculum alignment ensures that the intended curriculum (what is planned), the enacted curriculum (what is taught), and the learned curriculum (what students actually learn) are consistent and mutually reinforcing.

Research shows that curriculum alignment positively correlates with student achievement by reducing gaps in knowledge and skills and improving resource utilization (Insuasti & Zapata-Jaramillo, 2024; Kusmawan et al., 2025; Okojie et al., 2022). Challenges in curriculum alignment include achieving teacher buy-in, addressing differences in teaching practices, resistance to change among various stakeholders, and managing institutional constraints

(Sharma, 2025; Tomlinson, 2023; Twining et al., 2021). Whatever be the challenges, curriculum mapping plays a dual role: it supports curriculum developers in designing coherent pathways and assists educators in delivering consistent instruction.

Importantly, since the focus of this research is on content harmonization, we delve more into it. According to Wijngaards-de Meij and Merx (2018), content harmonization refers specifically to the process of aligning and integrating the subject matter, topics, and learning content across two or more curricula to ensure consistency, coherence, and progression in student learning. It involves detailed curriculum mapping to compare content coverage, depth, and sequencing, identifying overlaps, gaps, and redundancies (Insuasti & Zapata-Jaramillo, 2024; Jin et al., 2019). Successful content harmonization requires collaboration among subject matter experts, curriculum developers, and instructors to ensure that the content is relevant, rigorous, and aligned with both academic and industry standards (Martone & Sireci, 2009). Importantly, continuous review and adaptation are essential to respond to evolving educational and labor market needs.

In this research, the scope was deliberately delimited to content alignment rather than overall curriculum harmonization. While curriculum harmonization encompasses broader aspects such as learning outcomes, subject matter, pedagogy (instructional methods), and assessment, this study was focused specifically on aligning the subject matter and content coverage between the technical stream of school-level education (Grades 9-12) and the pre-diploma and diploma programs under CTEVT. This narrower focus aimed to ensure that the knowledge and skills taught in these two related educational levels are coherently sequenced and mutually reinforcing, facilitating smooth student transitions and reducing learning gaps without addressing other dimensions of curriculum integration. We believe the curriculum mapping and alignment between the technical stream of secondary education and CTEVT's pre-diploma and diploma programs are crucial to ensure educational coherence, improve student outcomes, and meet the evolving needs of the workforce and society.

Limitations of the Study

A key limitation of this research was the extensive time required for the desk review process, which involved thorough analysis by the research team followed by detailed evaluation from subject matter experts. This sequential review extended the overall timeline of the study and consequently caused delays in the subsequent fieldwork phase. The prolonged review period, while essential for ensuring the rigor and accuracy of curriculum analysis, constrained the research schedule and limited the time available for in-depth stakeholder engagement and data collection.

The research has relied primarily on inputs from certain groups (e.g., teachers and curriculum experts, and students) while underrepresenting other stakeholders such as parents, employers, and industry partners, which might have limited the comprehensiveness of insights into curriculum effectiveness.

Structure of the Report

This research is structured into four chapters. The first chapter introduces the study by presenting the background, objectives, and scope. The second chapter outlines the methodology, detailing the research design, data collection methods—including desk review and stakeholder interviews—and the ethical protocols. The third chapter provides a comparative analysis of the curricula, combining findings from the desk review with insights and perceptions gathered from key stakeholders to offer a comprehensive understanding of curriculum alignment and challenges. Finally, the fourth chapter summarizes the key findings, draws conclusions, and presents evidence-based recommendations aimed at enhancing the alignment and effectiveness of technical education programs in Nepal.

CHAPTER II
METHODOLOGY

Study Design

Given the exploratory nature of the objectives—which focus on analyzing the existing curriculum of both the technical stream at the school level (grades 9-12) and the pre-diploma and Diploma levels of CTEVT to identify any gaps, overlaps, or inconsistencies in the content—a qualitative method was deemed most suitable. Qualitative research enables an in-depth examination of complex phenomena within their natural settings, allowing for rich, detailed data collection and analysis (Creswell, 2018; Tisdell et al., 2025). Therefore, desk review, focus group discussion (FGD) and key-informants' interviews (KII) were the primary research strategies for getting qualitative information so as to understand the status, strengths and areas for improvement in the existing technical stream curricula. We conducted a qualitative study, adopting tools and methods commonly used in comparative analysis (esp. curriculum mapping) research. The tools and methods used were designed to the study's requirements, and also complied with the scope of the work.

Desk Review

The study included desk review of the curriculum of both the technical stream at the school level (grades 9-12) and the pre-diploma and Diploma levels of CTEVT. A thorough comparative study followed by stakeholder workshop at CDC further validated the study. The study focused on the review of the content areas of the curriculum, rather than other components.

The desk review employed a comparative content analysis (Chen et al., 2023; Kuckartz, 2014; Malekipour et al., 2017; Sturing et al., 2011) approach, with a particular focus on curriculum mapping. This methodology involved a systematic review and examination of the curricula from the technical stream (grades 9-12) and the pre-diploma and diploma programs under CTEVT. The primary objective was to identify gaps, overlaps, and alignments in curricular content to facilitate harmonization across these educational streams.

For this study, the scope of the review was delimited to the following subject areas: Plant Science, Animal Science, Civil Engineering, Computer Engineering, and Electrical Engineering. By mapping and analyzing these specific domains, the review provided insights into the coherence and progression of subject matter, ensuring a clear alignment of curricular contents. The curriculum mapping matrix (tool) and subsequent filled in matrix are presented in Annex.

Stakeholder Consultation

After the initial desk-review of the two curricula, we also held stakeholder consultations at all seven provinces. In accordance with the TOR, we included the seven schools (one from each province) initially proposed. Additionally, we selected two more schools from each province, ensuring representation from both educational streams, schools with varied resources (e.g., highly resourceful, average and under-resourced – as agreed with the EDCU officials) and different programs, thereby covering three distinct subject areas per province. Moreover, two more schools were selected to represent a balanced coverage of subject areas. As a result, the final sample comprised 26 schools (See Annex for the list).

This way, a total of 26 schools were the school-based samples. One school in each province had already been given and the other two schools were selected based on the discussion with CDC, CEHRD and the representation of the schools with low, medium, and high student populations in each province was ensured. Equally importantly, representation of the CTEVTschool types (affiliate, TECS, private, etc.), schools with resource classes were also represented.

In the selected sample sites, we interviewed headteachers, teachers, and have focus group discussions with parents/SMC and students. Moreover, Local Education Officers of the corresponding LGs (where the sample schools were based) were also interviewed. Importantly, CDC, CEHRD and CTEVT stakeholders were also consulted. The tools for interview and FGD are also put in Annex.

Following table summarizes the participants of the qualitative consultations:

SN	Category of Participants	Interview or FGD	Number of Participants or FGDs	Remarks
1	Headteachers	Interview	23	3 headteachers not available during fieldwork
2	Teachers	FGD	26	13 CTEVT programs (Plant_Animal _Civil _Computer _Electrical),

				11 CDC programs (Plant_Animal _Civil_Computer_Electrical and 2 schools have both CTEVT / CDC program conducting
3	Students	FGD	24	13 CTEVT programs (Plant_Animal _Civil _Computer _Electrical), 11 CDC programs (Plant_Animal _Civil_Computer_Electrical and 2 schools have both CTEVT / CDC program conducting
4	Parents	FGD	22	Parents not available in 4 schools
5	Local Education Officers	KII	23	3 respondents from local government not present
6	CTEVT	KII	2	Officer level representatives from CTEVT
7	CDC	KII	1	Consultations with CDC stakeholders were also held for 3 rounds.

Data Analysis Procedure

The data analysis procedure for this study involved a multi-method approach integrating curriculum mapping review, comparative content analysis, and thematic analysis to comprehensively identify gaps, overlaps, and stakeholder perspectives across educational curricula.

First, a review of the curriculum mapping matrix was conducted to systematically compare the curricula of the CDC and the CTEVT. This review aimed to identify areas of alignment, gaps, and redundancies between the two curricula by examining course outcomes, content coverage, and instructional strategies across programs. The curriculum mapping data were analyzed at both course and program levels, using guiding questions to assess clarity of outcomes, congruence with program goals, and consistency of assessment and teaching methods, following established frameworks for curriculum review (Dyjur et al., 2019).

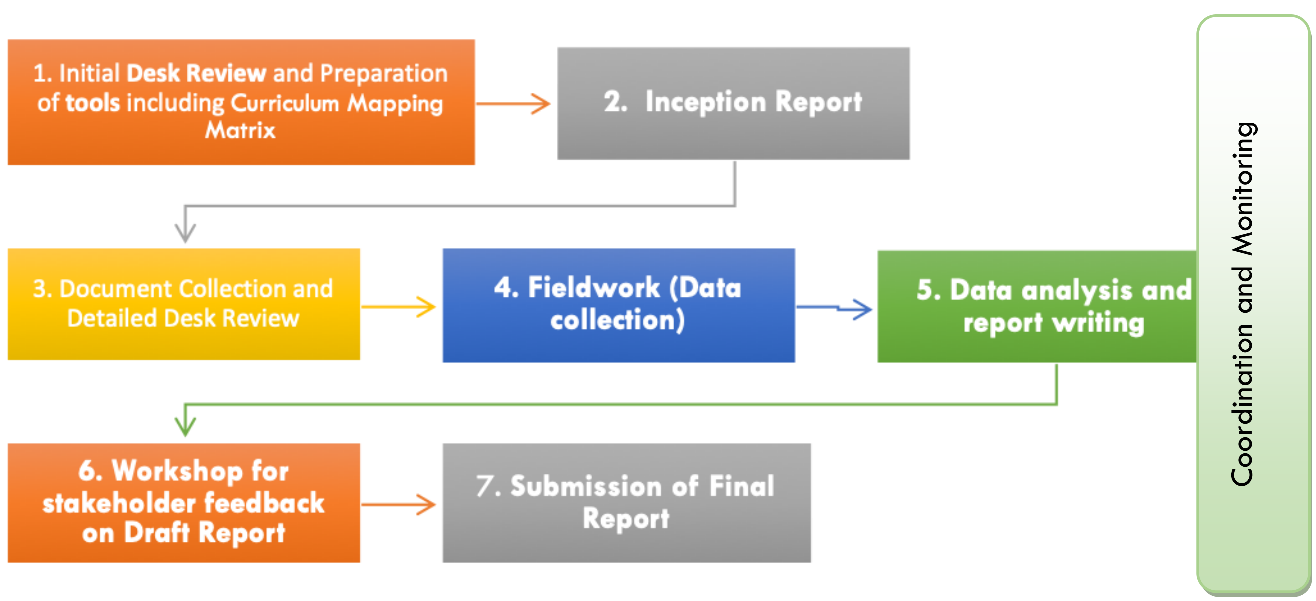
Next, a comparative content analysis was applied to the curricular documents and related policy texts to quantify and compare thematic emphases and content categories between CDC and CTEVT curricula. This approach, grounded in methodologies described by Chen et al. (2023) and Kuckartz (2014), involved coding textual data into predefined categories and assessing convergence and divergence patterns to reveal the extent of curricular integration or differentiation. This method allowed for a systematic, replicable comparison minimizing subjective bias in document interpretation.

Finally, a thematic analysis was performed on qualitative insights gathered from stakeholders at multiple administrative levels—schools, local governments, district, provincial, and federal authorities. This analysis followed the step-by-step procedures outlined by Patton (2002) and further elaborated in qualitative research guides, involving coding interview transcripts and documents to identify recurrent themes, patterns, and stakeholder concerns regarding curriculum implementation and alignment. Thematic analysis facilitated an in-depth understanding of contextual factors influencing curriculum coherence and stakeholder perceptions. Moreover, the desk review data was triangulated with the field-based data from different stakeholders.

Overall Methodology

The flowchart illustrates the major steps/tasks to be undertaken to accomplish this research.

Figure 2: Methodological Steps of the Study



- Procedurally, we worked closely in coordination and collaboration with the Research Unit of the CDC in all phases of the study. More specifically, we collaborated with the CDC's nominated contact person to ensure the quality and integrity of the research at various stages. (#Coordination & Monitoring)
- We developed curriculum mapping tools, and other qualitative data collection tools.
- We developed an inception report incorporating the tools, detailed methodological processes and updated the field mobilization plan. It was be presented to CDC experts and finalized by incorporating feedback. (Step#2)
- Engaging research team members, we first filled in the curriculum mapping matrix and then the comparison matrix was quickly reviewed by relevant subject teachers. Based on the matrix, we presented a clear visual representation of curriculum mapping that identified gaps, redundancies, and misalignments across the curricula. (Content review matrix is put in Annex. (Step#3)
- We then conducted fieldwork in 21 sample schools, corresponding LG and also at CDC, CEHRD and CTEVT. (Step#4)
- We deduced data and key insights from the both curriculum mapping and participatory consultations with stakeholders and explored gaps, alignments and ways of improvement. (Step#5)
- We analyzed the data from multiple sources including desk review, KIIs, workshop and prepared a draft report. (Steps#5)
- We presented the findings and recommendations of the study in a report-sharing workshop, as per the time, venue, and participants collectively decided by CDC and C&C. (Step#6)
- We incorporated all the relevant feedback received from the feedback consultation event and finalized the report accordingly. (Step#7)

Ethical Protocols

Maintaining confidentiality and ethical norms during the entire research process was one of the prime concerns of this activity. We were aware of ethical guidelines and considerations while conducting research with adult human beings (esp. experts). We adhered to the basic ethical principles of research, including informed consent, anonymity, no harm, autonomy of the participant, parental consent in case of student participation, and fair presentation of empirical data. Moreover, we also followed the guidance of the 'Research Integrity and quality assurance panel' of the Consulting Firm that focused on research ethics and quality commitment (attention to detail and accuracy, delivering the highest quality of research insights, quality for long-standing relationships with our clients, and the highest level of quality throughout all our engagements).

We acknowledged that there are individuals and groups who experience disadvantages in our society. This could be because of age, sexual orientation, marital status, race, colour, gender, disability, religion, class or beliefs. We respected and valued each other's differences and protect individuals and groups from discrimination based on their "protected characteristics". We were committed to promoting positive non-stereotypical images in displays and activities. We neither used or engaged in, nor allowed our researchers/enumerators or other persons engaged by us to use or engage in, any threats of violence, verbal or psychological harassment or abuse, and/or sexual exploitation and abuse. The team ensured that the research was conducted in an ethical and sensitive manner. Through reflective practice and self-evaluation, we implemented monitoring systems to highlight shortcomings and review our procedures and practices accordingly on a regular basis.

Finally, all raw data, including datasheets or any other documentation, information were submitted to the CDC upon completion of the assigned task. While publishing further knowledge products (e.g., journal article, OpEd articles, policy brief), proper acknowledgment will be made to CDC for its support in conducting the study.

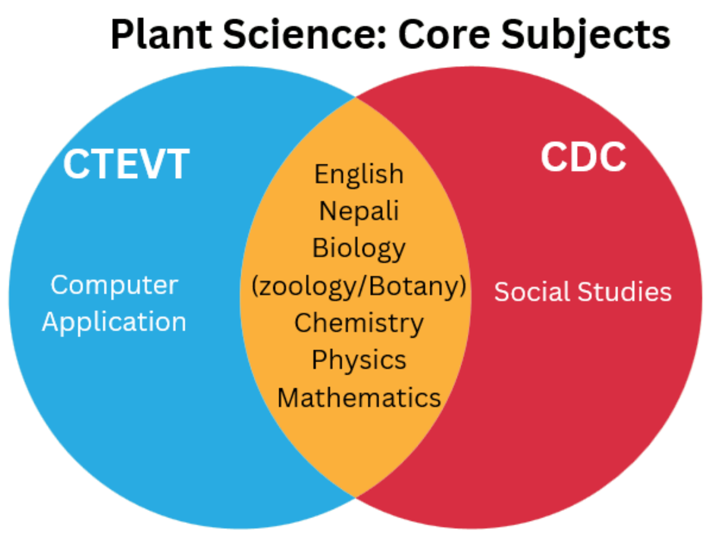
CHAPTER III

COMPARATIVE ANALYSIS OF THE CURRICULA

This section presents a comparative review of the two curricula developed by the CDC for the technical stream at the school level (grades 9-12) and by CTEVT for pre-diploma and diploma programs. While a brief overview of the core curricula has also been provided to set the context, the primary focus is on examining the disciplinary ideas and subject matter within five technical fields (subject areas) including Plant Science, Animal Science, Computer Engineering, Civil Engineering and Electrical Engineering. This approach allowed for a detailed analysis of content alignment and coherence across the two educational levels, highlighting areas of convergence and divergence.

Comparison of Core Subjects

Here, we make a focused analysis of the core courses within the curricula of CDC's technical stream (Grades 9-12) and CTEVT's pre-diploma and diploma programs, although core subjects are not the focus of this study. The review reveals that most core subjects, such as English, Mathematics, Physics, and Chemistry, are common to both curricula, ensuring a shared academic foundation. However, CDC's curriculum uniquely includes Social Studies as a compulsory subject in Grade 12, emphasizing civic awareness and life skills, which is notably absent in both pre-diploma and diploma programs of CTEVT. This omission suggests a gap in CTEVT's curriculum regarding the development of social and democratic values that are integral to the school-level curriculum. Conversely, CTEVT incorporates Computer Application as a core course at the diploma level, reflecting the growing importance of digital skills in technical education; this subject is not included as a core course in



CDC's technical stream but is offered as a specialization under the Computer Engineering discipline and an integrated course with other disciplines.

Comparison of Disciplinary Areas

Plant Science

CTEVT Specific Courses	Common Courses	CDC Specific Courses
Community Development Social mobilization Communication Grain, Legumes and Oilseed Crops Integrated Pest Management (IPM) Farmer Field School (FFS) Spice crop Lac Culture Entrepreneurship Agro-metrology and Environmental Science Non-timber Forest Products (NTFPs) Agriculture Statistics Animal Husbandry	Agriculture Extension Agronomy Horticulture Floriculture and Nursery Plant Protection Fish Culture (Aquaculture) Sericulture Apiculture (beekeeping) Food Crop (Cultivation, harvesting, post-harvesting/ crop/commercial crop/industrial crop/crop seed/vegetable/fruit/cereal) Mushroom Agricultural Entomology (insect pest control) Seed Technology Farm Machinery, Farm Mechanization Irrigation Soil Fertility Plant Pathology Agri-Economics Medicinal Plants OJT/Internship	Computer Science Industrial Entomology Nutrient Management

The comparison of the CDC and CTEVT curricula in the discipline of Plant Science reveals both shared content areas and distinct emphases reflecting their different educational levels and objectives. Both curricula cover foundational and core agricultural subjects such as Agronomy, Horticulture, Plant Protection, Soil Fertility, Plant Pathology, and Seed Technology, indicating a common base of disciplinary knowledge essential for plant science education. However, CTEVT's curriculum integrates a broader range of applied and community-oriented courses like Community Development, Social Mobilization, Farmer Field School (FFS), Entrepreneurship, reflecting its focus on preparing mid-level technical personnel with practical skills and extension services for direct engagement with farming communities. In contrast, CDC's curriculum concentrates more on conceptual and theoretical aspects of horticulture and plant protection, including detailed study of climate impact, organic farming, orchard management, and pesticide application, designed to build foundational scientific understanding in students at the secondary level.

Moreover, CTEVT includes specialized topics such as Lac Culture, Non-Timber Forest Products (NTFPs), Animal husbandry, and Agricultural Statistics, which are not explicitly covered in CDC's curriculum, highlighting CTEVT's emphasis on diversified agricultural enterprises and data-driven decision-making. Conversely, CDC offers Computer Science as a subject under specialization, while CTEVT integrates computer applications related to agriculture more explicitly at the diploma level, aligning with the need for technical proficiency in modern agricultural practices. The presence of courses like Agricultural Economics and Nutrient Management in both curricula further underscores their shared goal of equipping learners with knowledge for sustainable and economically viable agriculture.

However, some of the courses not fully falling with the scope of plant science (e.g., aquaculture, apiculture, lac culture, animal husbandry) are also mixed in plant science curriculum in both CDC and CTEVT curriculum. According to a subject teacher, *"Although scientifically these [Aquaculture, apiculture,* sericulture*, lac culture and animal husbandry] are part of Animal Science, Nepal's technical curriculum mixes them in Plant Science due to practical, institutional, and curriculum structuring reasons. It reflects an integrated farming approach, workforce alignment, and the scope of technical education aimed at equipping students with diverse* *agricultural livelihoods, not strict disciplinary specialization."* However, other experts refuted this idea and found these to be cross-cutting ideas in both plant and animal science programs.

Animal Science

CTEVT Specific Courses	Common Courses (Both CDC and CTEVT curriculum have)	CDC Specific Courses
Communication Social Mobilization and Community Development Agri-Economics and Farm Management Elementary Animal Reproduction Animal Husbandry and Entrepreneurship Theriogenology Animal Welfare and Jurisprudence One Health, Zoonosis and Food Safety Farm Housing and Biosecurity	Veterinary/Agriculture Extension Livestock Production and system/management Fodder Production Animal Nutrition Veterinary Anatomy and Physiology Introductory Animal Health (management)/ Veterinary Laboratory Technology Veterinary Pharmacology Aquaculture and Fisheries Ruminants Production and Management Non-Ruminants Production and Management Commercial Poultry Farming Genetics and Animal Breeding Basic Surgery	Dairy Product Technology Meat Science and Technology Radiology

The comparison of the CDC and CTEVT curricula in the discipline of Animal Science reveals both shared foundational courses and distinct emphases reflecting their respective educational levels and objectives. Both curricula include common core subjects such as Animal Nutrition, Animal Husbandry, Agri-Economics, and Veterinary Extension, which provide essential knowledge for understanding livestock production and management. Moreover, both curricula extend further into specialized and applied areas such as Veterinary Pharmacology, Veterinary Laboratory Technology, Basic Surgery, Commercial Poultry Farming, and Dairy Product Technology, emphasizing practical veterinary skills and mid-level technical competencies required for fieldwork and para-veterinary services.

CDC’s curriculum uniquely focuses value addition and diagnostic tools (radiology), supporting agribusiness and technician-level services in food production and animal health (Dairy product and meat science technology). On the other hand, CTEVT integrates community development, social mobilization, and entrepreneurship courses, highlighting its role in preparing graduates for extension work and livestock enterprise management. Moreover, CTEVT curriculum also covers animal rights, ethical treatment, and legal frameworks governing veterinary practices (Animal Welfare and Jurisprudence). Importantly, it trains students in the design and maintenance of hygienic animal housing and implementation of disease prevention protocols - reducing disease outbreaks—critical for both commercial farms and community-based livestock systems (Farm Housing and Biosecurity).

Overall, CTEVT seems to prepare students for immediate employment, entrepreneurship, field-level veterinary services, animal welfare and biosecurity; whereas CDC's courses might be better suited for those aiming to pursue higher education, supervisory roles, or specialized industries like meat and dairy processing. Blending the value chain-focused content of CDC with the community/ entrepreneurship focus of CTEVT would create a more balanced and responsive curriculum.

Computer Engineering

CTEVT Specific Courses	Common Courses	CDC Specific Courses
Fundamental of Information Technology Basic Electrical and Electronics Engineering Web-Technology Internet of Things System Analysis & Design	Programming principal & C Programming Computer Application Fundamentals of electro-system Computer Organization and Architecture Website Design Data Structure Object Oriented Programming in java Computer Hardware, Electronics Repair and Maintenance Database Management System Digital Design and Microprocessor Operating System Computer programming / Visual or graphics programming Computer Network Software engineering	Mobile Application Development Contemporary technology

The Computer Engineering curricula of CDC and CTEVT share several fundamental topics, including computer organization, programming principles, website design, and computer networks, forming a common technical foundation. However, the CTEVT curriculum places greater emphasis on practical and emerging technologies such as Web Technology, Internet of Things, and System Analysis & Design, reflecting its focus on equipping students with skills directly applicable to current industry needs. In contrast, CDC's curriculum leans more towards developing a strong theoretical base, covering programming languages like C and Java, data structures, digital design, microprocessors, and software engineering concepts.

Additionally, CDC includes specialized subjects such as computer hardware repair and mobile application development, which complement the more hands-on, technology-driven courses offered by CTEVT. This distinction highlights CDC's role in building foundational knowledge at the secondary school level, while CTEVT aims to prepare students for immediate technical roles through applied learning and up-to-date technological content. Aligning these curricula could enhance continuity and better prepare students transitioning from school-level education to diploma-level technical training.

Civil Engineering

CTEVT Specific Courses	Common Courses	CDC Specific Courses
Computer Aided Drafting Engineering Drawing Irrigation Engineering Construction material Construction Drawing and CAD Road and Trail Bridge Soil Mechanics and Foundation Engineering Hydraulics	Computer and Drawing Water supply and sanitary engineering Construction Technology and workshop Building Construction and Drawing Engineering Surveying Estimating, Costing and Supervision Applied Mechanics Mechanics of Structure Fluids Mechanics RCC Structure Construction Management	Water Resource Engineering Highway Engineering Geo-Technical Engineering

The comparison of the CDC and CTEVT curricula in Civil Engineering reveals both cover essential topics such as Engineering Drawing, Construction Materials, Soil Mechanics, Hydraulics, Water Supply and Sanitary Engineering, and Surveying, establishing a common technical base. CDC's curriculum places particular emphasis on theoretical principles and foundational knowledge, including Applied Mechanics, Mechanics of Structures, Fluid Mechanics, and RCC Structures, which provide students at the secondary level with a strong conceptual understanding of civil engineering fundamentals.

In contrast, CTEVT's curriculum integrates more application-oriented and specialized courses such as Computer Aided Drafting (CAD), Irrigation Engineering, Road and Trail Bridge construction, and Construction Management, reflecting its focus on producing job-ready technicians capable of supervising and executing civil engineering projects. CTEVT also includes practical subjects like Estimating and Costing, which are critical for project planning and resource management. Additionally, CDC offers workshop-based courses on construction technology and hands-on skills in masonry, carpentry, and timber preservation, blending theoretical knowledge with practical exposure at the school level.

The inclusion of advanced topics like Highway Engineering and Geotechnical Engineering in CDC's curriculum further highlights its role in preparing students for specialized civil engineering roles beyond the foundational stage. Overall, while CDC aims to build a solid theoretical foundation and basic practical skills, CTEVT extends this foundation by emphasizing applied knowledge, technical proficiency, and project management skills. Aligning these curricula through content harmonization can enhance vertical articulation, ensuring students transitioning from secondary technical education to diploma-level training experience a coherent and comprehensive learning progression.

Electrical Engineering

CTEVT Specific Courses	Common Courses	CDC Specific Courses
Civil Construction and Survey Electro Technology Logic Circuit Bench work Electrical design and estimation	Computer Application Engineering Drawing Fundamental of Electrical Engineering Electrical Installation Electrical Machine Basic Electronics	Workshop Technology

Fundamentals of Control system Entrepreneurship Development Power System operation and maintenance Micro hydropower Electrical installation	Industrial Installation and Maintenance Utilization of Electrical Energy Electrical Measurement and Instruments Repair and maintenance Electrical Installation, Estimation and Circuit Design Power Transmission and Distribution Switchgear and protection Renewable Energy System Electrical CAD (Computer Aided Design)	

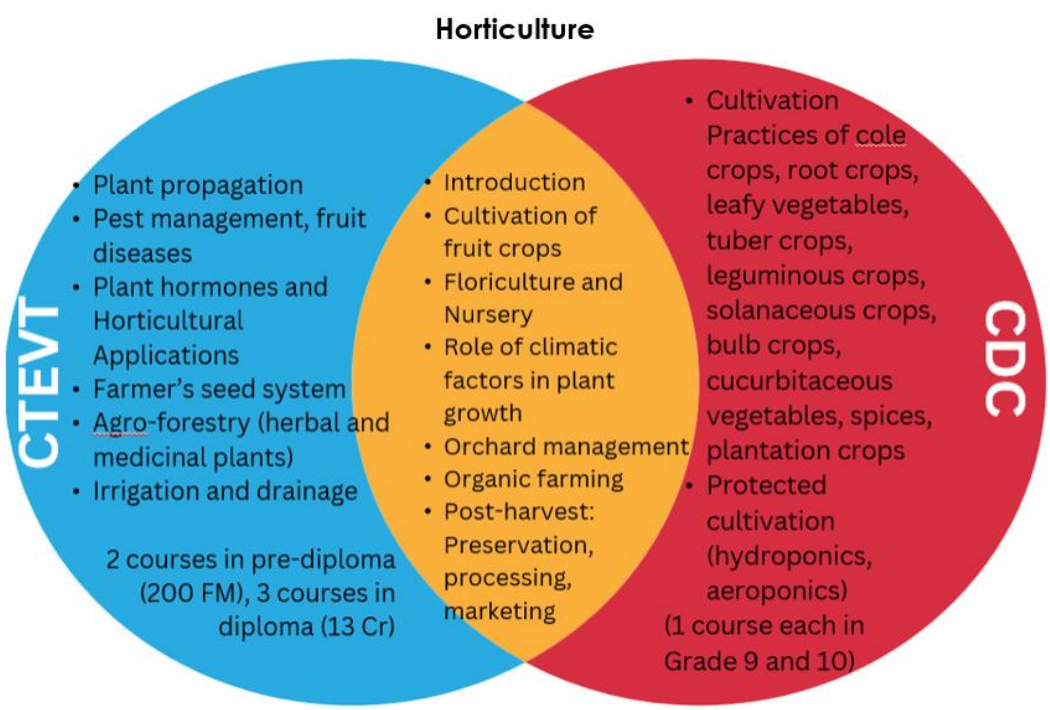
The comparison of the CDC and CTEVT curricula in Electrical Engineering reveals a distinct but complementary focus in subject integration, reflecting their respective educational levels and aims. Both curricula cover fundamental topics such as Electrical Installation, Basic Electronics, Electrical Machines, Computer Aided Design (CAD), and Electrical Measurement and Instruments, ensuring students acquire essential electrical engineering knowledge. CDC emphasizes foundational theory and workshop-based skills, including Engineering Drawing, Workshop Technology, and Computer Application, designed to build a solid base at the secondary school level.

CTEVT's curriculum, meanwhile, extends into more specialized and applied areas such as Power System Operation and Maintenance, Micro Hydropower, Electrical Design and Estimation, and Fundamentals of Control Systems, preparing students for technical roles in industry and power sectors. The inclusion of subjects like Entrepreneurship Development and Electrical Repair and Maintenance highlights CTEVT's focus on practical skills and employability. Additionally, CTEVT integrates logic circuits and bench work, which provide hands-on experience essential for diploma-level competence.

Overall, the CDC curriculum provides a strong theoretical and conceptual foundation suitable for school-level learners, while the CTEVT curriculum extends this foundation with practical, community-focused, and enterprise-oriented content aimed at producing job-ready technicians. This complementary relationship suggests that aligning the curricula through careful content harmonization could facilitate smoother student transitions and enhance the relevance and continuity of disciplinary focus across the two educational systems.

Comparison of Individual Courses

Individual course comparison also shows that there are a lot of content similarity across courses yet some slight variation in the two curricula. Moreover, since the CTEVT programs (pre-diploma and diploma) encompass more varied courses and semester breakdown in Diploma level; CTEVT offers more courses and therefore more than one course from CTEVT curriculum can directly align with a course from CDC. This way, CTEVT programs have relatively wider and deeper content coverage of most of the subject areas. One example is presented from a course in Plant Science program here;



The above figure shows that both the CTEVT and CDC curricula cover foundational topics in horticulture such as fruit crop cultivation, floriculture, nursery management, climatic factors affecting plant growth, orchard management, organic farming, and post-harvest practices including preservation, processing, and marketing. This common ground reflects a shared understanding of essential horticultural knowledge required at various education levels.

However, distinct differences in scope, depth, and focus reveal contrasting educational philosophies and target outcomes between the two curricula. **CDC's curriculum** emphasizes a broad spectrum of vegetable cultivation practices, including cole crops, root crops, leafy vegetables, tuber crops, leguminous crops, solanaceous crops, bulb crops, cucurbitaceous vegetables, spices, and plantation crops. It also introduces protected cultivation techniques such as hydroponics and aeroponics, spread across two courses in Grades 9 and 10. This approach suggests a focus on foundational agricultural knowledge for school-level students, with an emphasis on crop diversity and modern cultivation methods. The inclusion of protected cultivation demonstrates CDC's attempt to introduce innovative farming technologies early in the education process.

In contrast, **CTEVT's curriculum** is more specialized and advanced, designed for pre-diploma and diploma levels, with a heavier course load (2 pre-diploma and 3 diploma courses). It covers plant propagation, pest management, fruit diseases, plant hormones and horticultural applications, farmer's seed systems, agroforestry (including herbal and medicinal plants), and irrigation and drainage. This reflects a vocational and technical training orientation aimed at producing skilled graduates ready for employment or entrepreneurship in horticulture. The focus on pest and disease management, plant physiology, and agroforestry indicates a curriculum tailored to address practical challenges faced by farmers and horticulturists, and to support sustainable agricultural practices.

Based on the above chart, following key observations and implications are made:

- **Breadth vs. Depth:** CDC offers broad exposure to various vegetable crops and modern cultivation technologies, suitable for foundational education. CTEVT provides greater depth in technical and applied aspects, aligned with workforce readiness and specialized skills development.

- **Theoretical vs. Practical Orientation:** CDC's curriculum leans towards foundational theory and general agricultural knowledge appropriate for school students, whereas CTEVT emphasizes applied skills, problem-solving, and practical knowledge critical for diploma-level students entering the labor market.
- **Curriculum Progression:** The CDC curriculum's placement of protected cultivation in early grades contrasts with CTEVT's focus on advanced topics like plant hormones and agroforestry at higher levels, indicating a potential gap in vertical articulation between the two systems that could affect student transition and knowledge continuity.
- **Relevance to Market Needs:** CTEVT's inclusion of pest management, seed systems, and irrigation addresses immediate industry and farmer needs, aligning with its mandate to produce employable graduates. CDC's curriculum, while comprehensive, may benefit from integrating more applied and market-relevant components to enhance student preparedness for vocational pathways.
- **Integration Opportunities:** There is potential for harmonizing the curricula by integrating CDC's broad-based foundational content with CTEVT's specialized applied knowledge, facilitating smoother academic and career progression for students.

Other course comparison matrix is put in the Annex.

Curriculum Assessment: Programmatic Perspective

This section presents a detailed analysis of curriculum alignment, redundancy, and stakeholder perceptions across five key programs—Plant Science, Animal Science, Computer Engineering, Electrical Engineering, and Civil Engineering. The analysis draws on rich qualitative data from teachers, headteachers, students, parents, and local education officers, highlighting both strengths and persistent challenges in both systems of technical education (CDC and CTEVT).

Content Relevance and Continuity

Teachers, students, and headteachers expressed concerns about the relevance and coherence of the curriculum. A recurring theme was the lack of practical, market-oriented skills and insufficient industry collaboration. One teacher summarized:

"The CTEVT curriculum's effectiveness is moderate but faces challenges due to outdated content and insufficient alignment with market needs. Some subjects are overly complex, while others lack depth, impacting comprehension and relevance. Greater industry collaboration and periodic updates could enhance its market suitability and overall impact."

Students in the Animal Science program (CDC) echoed the value of practical learning and employment prospects, but also highlighted gaps:

"The curriculum prioritizes scientific, evidence-based learning, which encourages innovation and research... This program is not limited to classroom learning alone—it also offers opportunities for laboratory and field-based learning, which I believe effectively prepares students for the job market." She adds, *"...however, in reality, limited practical opportunities are provided for field-based activities, which hampers effective learning."*

Overall, challenges such as lack of skilled human resources, insufficient practical skills, outdated technologies, and weak coordination with industry and government were frequently cited.

Redundancy in Subject Areas

Stakeholders consistently identified overlaps and gaps between the school-level technical stream (grades 9–12) and the pre-diploma/diploma programs under CTEVT. A teacher from Tehrathum noted:

"Some CTEVT curriculum subjects, like overly theoretical topics especially chemistry, physics and biology contribute minimally to practical skills and may hinder student progress. Redundant or outdated content can confuse learners and reduce program relevance. Streamlining the curriculum to focus on market-driven skills would enhance learning outcomes."

"Alignment between the technical stream (9-12) and CTEVT's pre-diploma/diploma is weak due to differing focuses. The technical stream emphasizes foundational theory, while CTEVT

prioritizes practical skills. Better curriculum integration and shared learning outcomes could improve coherence." – Teacher, Rupandehi

This redundancy is particularly evident in foundational science subjects, which appear in both plant and animal science programs, sometimes without clear differentiation. As a teacher from Dadeldhura clarified:

"Subjects like beekeeping, sericulture, aquaculture, lac culture, and animal husbandry fall under crop science due to their integration in agricultural systems... They also appear in animal science because they involve animal rearing and management, creating overlap. Clearer delineation and interdisciplinary approaches could reduce redundancy in both fields.

Specific topics such as beekeeping, sericulture, aquaculture, and animal husbandry appear in both plant science and animal science streams, leading to overlap and confusion. Stakeholders, especially teachers teaching plant science program (from Dadeldhura, Humla, Kaski, Sarlahi) suggested clearer delineation and interdisciplinary approaches to reduce redundancy.

Program-Specific Observations

Animal Science: Students appreciated the balance of theory and practice but noted that outdated content and lack of practical resources limited program effectiveness. The program's contribution to rural employment and entrepreneurship was widely recognized.

Plant Science: Similar concerns about content overlap and need for updated, market-driven skills were raised.

Engineering Programs: Similar themes of outdated content, insufficient practical exposure, and the need for better industry linkages were observed across Computer, Electrical, and Civil Engineering streams.

Broader Systemic Challenges: Barriers to effective program delivery included high tuition fees, limited public awareness, migration, and inadequate transportation/hostel, all of which contributed to low enrollment and high dropout rates, especially in rural and remote areas.

Suggestion: *"A single stream is to be launched (merging the two streams) through the TVET act."* – Headteacher, Koshi Province (CTEVT-Animal/plant)

The data reveal a consistent call for greater coherence, relevance, and responsiveness in technical and vocational curricula. Stakeholders valued the practical orientation and employment focus of TEVT programs but were concerned about outdated content, redundancy, and insufficient industry engagement. There is a strong consensus that regular curriculum updates, better alignment between educational levels, and enhanced practical training are essential for preparing students for the job market and supporting national development goals.

Strengths of the CDC Technical Stream Curriculum (Grades 9–12)

Foundational Academic Emphasis: The CDC technical stream provides a strong theoretical foundation, particularly in core science subjects, which supports students' academic growth and prepares them for further study.

Increased Accessibility and Awareness: The technical stream at the school level has garnered gradual awareness and accessibility, enabling more students to pursue technical education early in their academic journey. However, public perception of technical stream as not academic persists and a general tendency to be lenient on general education is high.

Skill-Based and Livelihood-Oriented Approach: Stakeholders recognize the value of the technical stream in promoting skill-based, livelihood-oriented education, which helps students become self-reliant and better prepared for employment.

Community and Student Interest: Programs are seen as attractive due to their potential for employment and alignment with students' chosen areas of interest, making learning more effective and relevant to local needs.

Weaknesses and Challenges

Academic Overload and Practical Gaps: The CDC curriculum is perceived as academically heavy, with an emphasis on theoretical knowledge at the expense of practical, hands-on skills. This creates a gap in entrepreneurial and job-ready competencies compared to CTEVT programs. A paradox was created – foundational academic emphasis (strengths) has embraced theoretical overload and practical gaps (weakness).

All stakeholders found it really difficult to manage adequate field visits (as recommended by the curriculum). A teacher shared: "*Students can relate the theoretical practice to actual field when they visit the different fields like substation, different power plant like hydropower, solar power plant, diesel power plant etc., industries. But we have neither budget for all these nor do we have time – since we have more courses than general stream and take more days even for trimester exams and we have more practical as well as theory to complete and thus have little time for field visits*."

Another teacher of Animal Science program also related that "*They have to make a field visit to Pokhara (as mentioned in the curriculum) for semen collection and processing, but the office in Pokhara (National Livestock Breeding Center) does not allow us to visit in and observe semen collection, evaluation and processing activities. There is no coordination with the office from CDC or NEB; this came to the curriculum without thinking whether it is feasible*."

Many participants (teachers and students) highlight that practical sessions, OJT (On-the-Job Training), and internships are either too short, poorly implemented, or not prioritized over theoretical content. This is a well-documented issue in TVET systems globally, where practical exposure is critical for employability (ILO, 2019).

Redundancy and Misalignment: There are notable overlaps in subjects (e.g., basic sciences) between the CDC technical stream and CTEVT curricula. The courses, such as chemistry, physics, and biology, are presented as core science subjects, rather than making them applied (contextualizing with relevant technical disciplines).

Participants across provinces reported declining student interest and enrollment, attributed to migration, lack of job opportunities, and perceived ineffectiveness of the education programs in offer. The sixteenth plan has also identified that the enrolment of students in subjects related to technical education and training is falling short of meeting target (NPC, 2025, p. 86). This aligns with studies showing that TVET attractiveness is closely linked to employment outcomes and social recognition (UNESCO-UNEVOC, 2017; TVET sector strategic plan, 2023-2032).

Limited Industry Collaboration: The implementation part of the curriculum lacks strong industry ties, which limits opportunities for practical training, internships, and exposure to current market needs.

Resource Constraints: Insufficient teaching-learning materials, lack of skilled teachers, and inadequate (use of) laboratory facilities—especially in remote regions—hamper effective implementation. Teacher retention, lack of permanent staff, inadequate training, and insufficient materials are persistent challenges. These resource gaps are consistently cited in the literature as undermining program quality and sustainability (Baral & Parajuli, 2024; Koirala, 2025; Kunwar et al., 2025).

Outdated Content: Some curriculum content is outdated and not aligned with current technological or industry trends, reducing its relevance for students seeking immediate employment. For example, the computer science part (which covers more than 50% of this course) in "Agriculture Extension and Computer Science" (CDC) is not really relevant to animal science. Some students commented, "*What do we do by learning about the types of computers, its history and operating systems, CD, VCD, DVD, floppy disks, etc.? There is no course on how digital tools and technologies can be used in plant science*." Similar was echoed by animal science students.

"CDC's curriculum is academically heavy, while CTEVT focuses on practical skills, creating gaps in entrepreneurial training. Overlaps exist in basic science topics, causing redundancy, and inconsistencies arise in practical application depth." – Teacher, Tehrathum

A comparative chart on different dimensions of program implementation

Aspect	**CDC Technical Stream (Grades 9–12)**	**CTEVT Pre-Diploma/Diploma Programs**
Academic Focus	Strong theoretical foundation; relatively easy transition to higher education	Emphasis on practical, job-oriented skills; somewhat difficult for transition to higher education
Practical Exposure	Limited, mostly classroom-based (curriculum assures	Extensive, with internships/OJT

	50% practical; but teacher/students indicate that it is not being fully implemented)	
Industry Collaboration	Weak	Weak (relatively better with more networks/projects (EVENT; ENSSURE; QualiTY) supporting industry collaboration)
Content Relevance	Largely okay; some contents are outdated, less market-driven	More aligned with market needs; still some outdated topics
Student Preparation	Prepares for further study	Prepares for immediate employment

The SWOC analysis of CDC's technical stream programs at grades 9-12 (see Annex) reveals a complex interplay of strengths and limitations that shape the effectiveness and relevance of these curricula in Nepal's context. Across disciplines such as Plant Science, Animal Science, Computer Engineering, Civil Engineering, and Electrical Engineering, **strengths consistently include the availability of key technical subjects across the country, provision of practical learning environments, and alignment with employment opportunities**. For instance, Plant Science benefits from easy accessibility and well-equipped agri-farms, while Computer Engineering boasts a balanced theory-practice ratio and functional laboratories. These strengths support the broader goals of Nepal's TVET system to equip students with market-relevant skills and facilitate smooth transitions to further education or employment, as emphasized in recent curriculum reform literature.

However, weaknesses and challenges highlight systemic issues that undermine curriculum delivery and student outcomes. Common weaknesses include inadequate management of practical versus theoretical learning protocols, irregular assessment and curriculum revision, and limited industry linkage for work-based learning, particularly in rural or less industrialized areas.

For example, Plant Science faces challenges due to the scarcity of nearby agri-businesses, and Electrical Engineering struggles with low student enrollment and frequent teacher turnover. These findings align with recent studies emphasizing the need for stronger industry collaboration, timely curriculum updates, and improved practical training to enhance TVET effectiveness in Nepal. Furthermore, challenges such as declining student populations, heavy course loads, and mismatched course sequencing point to the urgency of curriculum simplification and contextual adaptation to learner needs and local realities. Overall, the analysis underscores that while CDC's technical stream has foundational strengths, addressing weaknesses through continuous curriculum management, stakeholder engagement, and resource optimization is critical to sustaining and enhancing the quality and relevance of TVET programs in Nepal.

Courses and Contents to be Removed or Added

Teachers and students have different understanding about the course they have been teaching and learning and based on the primary data that are generated from the focused group discussion of teachers and students in the schools. Mostly teachers are the ones who have been better engaging with the course directly however the students no matter have focused with their study course primarily they too have experience for the syllabus and course content. So, following is the table that are developed based on their understanding about the course as taken out subject matters and the add in subject matter as per their common experience in different focused group discussion.

Teachers	Students
1. Move AutoCAD from Grade 9 to Grades 11 & 12; adjust course weight by adding some courses in Civil; increase practical over theoretical content.	1. Add more courses or modules on vegetable farming and fruit production.
2. Add a subject on sugarcane in Plant Science; improve management of practical sessions.	2. Remove computer, maths, and other general subjects; add more agriculture-related courses instead.
3. Remove Industrial Entomology and Fish Culture from Plant Science; add Entrepreneurship; Industrial Entomology is not job-relevant.	3. Remove Physics, Chemistry, and Maths; add Social Studies.

4. Remove or contextualize science/math subjects – making them more applied; allow SEE graduates to enroll in Plant Science for Grades 11 & 12; reduce math and social content in Plant Science for Grades 11 & 12; offer OJT after Grades 11 & 12 with student incentives; lower content in Grades 9 & 10; add extension subjects in Grades 11 & 12.	4. Reduce course load; increase practical content for easier skill and knowledge acquisition.
5. Remove Applied Mechanics (somehow covered in other courses); move C Programming to 2nd semester; require computer workshop; shift Software Engineering from 3rd to 7th semester.	
6. Remove Physics, Chemistry, and Maths; add bone and muscle anatomy, surgery and anesthesia, Agro-Economics, market promotion, consumer behavior, and entrepreneurship in Animal Science.	
7. Add Safety and Health Hazard with practical education.	

The divergent perspectives of teachers and students on the TVET curriculum in Nepal, as revealed through focused group discussions, underscore critical challenges in curriculum relevance, content balance, and pedagogical approaches. Teachers tend to emphasize restructuring the curriculum to enhance practical engagement and contextualize theoretical content, such as moving AutoCAD to higher grades and increasing practical components in Civil Engineering, or removing less job-relevant subjects like Industrial Entomology in favor of Entrepreneurship. They also advocate for contextualizing science and math subjects to make them more applied and relevant to agricultural and technical fields, reflecting a desire to align curriculum content with industry needs and student capabilities. This aligns with recent literature on TVET curriculum reform in Nepal, which stresses the importance of practical learning, industry linkage, and contextualization of theoretical knowledge to improve employability and skill acquisition (Baral, 2025; Kunwar et al., 2025; Thapa, 2024).

Conversely, students prioritize curriculum simplification and increased focus on agriculture-related content, proposing the removal of general subjects such as Physics, Chemistry, Maths, and Computer Science in favor of more specialized agricultural modules like vegetable farming, fruit production, and social studies. They also emphasize reducing course load and increasing practical content to facilitate easier skill acquisition and knowledge retention. This student perspective reflects a pragmatic approach to learning, where immediate applicability and manageable workload are critical. However, the removal of foundational subjects like science and math may risk undermining the development of critical analytical skills necessary for advanced technical competencies, a concern echoed in expert interviews. The tension between these perspectives highlights the need for a balanced curriculum design that integrates applied theoretical knowledge with hands-on skills, tailored to the diverse needs of learners while maintaining academic rigor. Recent TVET curriculum reviews in Nepal advocate for such integrative approaches, recommending stakeholder-inclusive curriculum development processes (Giri, 2025; Pradhan, 2025) to reconcile these differing views and enhance the overall quality and relevance of technical education.

Gap Analysis

Based on the desk review matrix (Detailed matrix with gaps and suggestions are submitted as a separate Excel file) and school based data collection, including the views of students and teachers, we developed a program wise gap analysis reports. The reports were further reviewed and verified by the subject experts. The finalized gap analysis reports of the five programs are presented below.

Electrical Engineering (Grade 9-12)

The stakeholders have identified several key areas where the program could be improved to better serve students and align with industry needs.

1. Repair and Maintenance (Grade 11)

- **Current Focus:** The curriculum emphasizes repair and maintenance procedures for AC machines (alternators, transformers, induction motors) and DC machines (DC generators), as well as overhead transmission lines (oH TL) and underground cables.

- **Instructor's Reflection:** Many students, upon completing 10+2, find themselves working with household appliances rather than large industrial machines. The instructor suggests a shift in focus toward the repair and maintenance of common household devices such as heaters, fans, induction cookers, and LED TVs. This adjustment would better equip students with practical skills relevant to their likely career paths.

2. Swapping Subjects (EMI and Electrical Machine)

- **Current Structure:** The EMI (Electrical Measurement and Instruments) subject is a foundational course, but has been put in grade 11. Likewise, 'Electrical Machine' subject is somewhat a complex course put in Grade 10.
- **Instructor's Concern:** The EMI content is more appropriate for grade 10, as it does not match the complexity required for grade 11. Conversely, the 'Electrical Machine' subject is quite challenging and may be better suited for grade 11. Swapping these subjects could provide a more logical progression and enhance student comprehension.

3. Installation (Grade 9)

- **Current Content:** Basic wiring practices are covered.
- **Suggested Enhancement:** Better to incorporate advanced practical, such as wiring for electrical door openers and tunnel lighting. Since students in CTEVT programs already engage in these advanced practices, integrating them into the 9–12 curriculum would help standardize skill levels and better prepare students for technical roles.

4. Transmission and Distribution (Grade 12)

- **Current Content:** Theoretical concepts are predominant.
- **Recommendations:**
    - Include practical numerical problems related to economic voltage levels and sag calculations.
    - Add hands-on experience with distribution transformers.

- Introduce concepts of linear and non-linear loads, as well as corona disruptive voltage calculations, to bridge the gap between theory and application.

5. Electrical Power System (Grade 11)

- **Instructor's Suggestion:** Incorporate simple numerical exercises on the economics of power generation and power factor calculations. These topics are crucial for understanding the operational and financial aspects of power systems.

6. Electrical CAD Based Design (Grade 12)

- **Current Issue:** The curriculum often conflates civil and electrical drawing topics, leading to confusion.
- **Proposed Change:** Refocus the content to emphasize electrical drawings, including relevant projects and planning exercises. This would provide clarity and practical skills directly applicable to electrical engineering.

7. Earthing and Lightning Arresters

- **Observation:** The topic of earthing appears in both grades 9 and 10 (also in grades 11-12).
- **Instructor's Recommendation:** Consolidate earthing content in grade 9, and reserve grade 10 for topics such as lightning arresters (LAs). This would streamline the curriculum and avoid unnecessary repetition.

8. Balance of Theory and Practical

- **Current Challenge:** Theoretical instruction has historically outweighed practical training.
- **Reflection:** To cultivate skilled human resources, it is better to reduce the weight of theory to 30–40 marks and increasing the emphasis on practical work. This shift would foster hands-on abilities and better prepare students for the workforce. However, clear guidelines and monitoring of the practical works are to be provided/done by CDC or relevant authority.

9. Industrial Automation

- **Gap Identified:** The curriculum lacks content on industrial automation.
- **Recommendation:** Introduce topics on industrial automation in grades 11 or 12 to ensure graduates are familiar with modern industry practices and technologies, thereby enhancing their employability as better technicians.

Conclusion

The above gap analysis has highlighted the need for a curriculum that is responsive to students' practical realities and the evolving demands of the electrical engineering field. Moreover, it suggests integrating more hands-on training, updating subject placements, and introducing contemporary topics like industrial automation. By making these adjustments, the curriculum would better prepare students for real-world challenges and help them build meaningful careers in electrical engineering.

Computer Engineering (Grades 9-12)

Some of the key observation and remarks obtained through multiple sources, including desk review and stakeholder feedback, also verified by the subject expert have been outlined below.

1. **Complex course title**: The following course titles seem to be more complex rather than content.

Grade	Course Title
9	Programming principal & concept in C Language
10	Data structure & OOP concept using C++
10	Computer Hardware, Electronics Repair and Maintenance
11	Web and Mobile Application Development

2. The course title (in the table of content) is misspelled and is misleading:

Grade 10	Current Course Title	Correct Title
10	Data Based Management System	Database Management System (The detailed course syllabus has correctly spelled it)

3. Similar content structure:

Grade	Course Title
9	Programming principal & concept in C Language
11	Programming in Java
12	Visual Programming

All of above courses share a similar content structure, including topics such as control statements, arrays, and strings. Instead of repeating these foundational concepts across different courses, it would be more effective if the **Programming in Java** and **Visual Programming** courses focused on application development. This approach would allow students to apply the concepts they have already learned in earlier grades, thereby deepening their understanding and enhancing practical skills.

4. Deviation in course title and content:

Grade	Current Course Title
11	Web and Mobile Application Development

The current course title suggests that students will engage in both the **development of web and mobile applications**, implying hands-on experience in designing, coding, and deploying applications. But there is a noticeable **mismatch between the title and the content**. The course **lacks practical elements** of application development, such as programming, interface design, user experience, and deployment. The learning outcomes do not reflect actual **development**

skills, which the title suggests. It would have been more effective for students if there were contents that would teach them to connect the frontend with backend to implement the real-world application.

To align the content with the title, it was suggested that the curriculum include **hands-on application development tasks** using tools such as Android Studio, Xcode, or basic web development frameworks (e.g., HTML, CSS, JavaScript). Alternatively, the course title can be revised to better reflect the theoretical nature of the course (e.g., *Introduction to Mobile and Web Application Concepts*).

5. Separate courses combined into one course:

Grade	Course Title
10	Data structure & OOP concept using C++
10	Digital Design & Microprocessor
11	Web and Mobile Application Development

It would be more effective to separate these subjects into distinct courses to allow focused learning and deeper understanding of each specialized area, ensuring students gain strong programming skills, hardware knowledge, and application development experience respectively.

6. Micro Syllabus as a Plus Point

Incorporating a micro syllabus into the curriculum would be a valuable enhancement. A micro syllabus provides a concise and organized breakdown of each unit, clearly outlining the key topics, learning activities, and expected outcomes. This helps both students and instructors understand the flow of the course and plan their teaching and learning strategies accordingly. It also improves transparency, aligns classroom activities with learning goals, and supports effective time management. Including a micro syllabus can bridge the gap between course objectives and student expectations, making the learning experience more structured and goal-oriented. **A micro syllabus helps ensure consistency among teachers nationwide in both teaching-learning processes and the preparation of assessment questions**.

7. On-the-Job Training

a. Schedule: To ensure better coordination and minimal disruption to academic activities, it is recommended (if possible) that On-the-Job Training (OJT) be conducted during regular working hours and begin prior to the start of final examinations by minimizing the some working hours in theoretical part which may need some changes in course allocation too.

b. Workplace: There should be a clear policy to ensure coordination with local government bodies, as well as private and public organizations, for identifying appropriate workplaces and effectively implementing On-the-Job Training (OJT) programs.

Animal Science

Some of the key observations on Animal Science Programs are outlined below:

Observations and Experiences

1. Course Sequencing and Curriculum Structure

The sequencing of courses in Grade 9 is not as effective as it could be. The current curriculum includes Mathematics, Science, English, Social, Nepali, Extension and Computer, Anatomy, Animal Health, and LPM. However, the distinction between compulsory and optional mathematics is confusing for students, and participants believed that these could be merged into a single subject. Similarly, combining the science curriculum for Grades 9 and 10 would reduce redundancy and make learning more coherent.

The curriculum is overloaded, and students are often overwhelmed by the number of subjects. If we could streamline the curriculum—perhaps by integrating Rural Sociology, Extension and Computer, English, Anatomy, LPM, and Animal Nutrition into a total of 700 marks—it would make the program more manageable and student-friendly.

2. Monitoring and Human Resource Management

In most of the instructors' experiences, the monitoring of the technical stream from Grades 9 to 12 has been loose and ineffective. The human resource management across the five technical subjects lacks coordination and productivity.

3. Coordination with CTEVT

A major challenge has been the lack of coordination between the 9-12 Technical Stream and CTEVT. Students often feel unsupported, and there have been instances where CTEVT-affiliated programs have actively hindered the smooth running of the technical stream. Improved collaboration is essential for student success and program sustainability.

4. Overload of General Subjects

There is an excessive load of general subjects in the technical stream, which detracts from the focus on specialized technical education. I strongly feel that some general subjects should be removed or reduced to allow students to concentrate on their chosen technical field.

5. Implementation of OJT Guidelines

Although On-the-Job Training (OJT) manuals and guidelines exist, they are not being effectively implemented. Many stakeholders do not take responsibility for ensuring that students receive proper practical exposure, which undermines the value of the program.

6. Laboratory and Practical Challenges

Laboratory management has not kept pace with curriculum changes. The facilities were set up based on the old curriculum, and as new subjects have been introduced, it has become increasingly difficult to conduct practical classes. Administrative and leadership inefficiencies at both the school and higher authority levels have further compounded these issues.

7. Budget and Leadership Concerns

Instructors have shared their experience that funds allocated for technical and vocational education are often diverted to administrative expenses or unrelated activities. Additionally, "school principals have not always demonstrated the leadership required to drive the program forward" – reflected an Instructor from Bagmati province.

Suggestions for Improvement

- **Curriculum Redesign:** Replace chapters such as Animal Health I & II, Veterinary Laboratory Technology, and Compulsory Mathematics with more relevant subjects like Statistics, Aquaculture and Fisheries, and English Grammar.
- **Marks Distribution:** For Grade 11, combine Chemistry, Physics, and Biology into single subjects spanning both Grades 11 and 12, and streamline other subjects to total 700 marks. Grade 12 should focus on Animal Breeding, Meat Science, Pharmacology, Animal Health III, General Surgery and Radiology, and OJT practical exercises, also totaling 700 marks.
- **OJT Scheduling:** Schedule OJT right before the Grade 12 exams (Magh, Falgun, Chaitra) and immediately after (Jestha, Aashadh, Shrawan) in two shifts to maximize practical exposure.
- **Community Awareness:** Increase awareness in the community to boost student enrollment and involvement in the technical stream.

Conclusion

With better curriculum re-design, improved monitoring, stronger coordination with CTEVT, and more effective use of resources, the animal science technical stream can fulfill its promise. These changes would not only make the program more accessible and relevant to students but also ensure that it genuinely prepares them for future careers in animal science and related fields.

Plant Science

Overall, the curriculum designed by the Curriculum Development Centre (CDC) for Grades 9 and 10 is well-structured and aligns closely with the CTEVT syllabus, especially in subjects like Agricultural Extension and Computer Science, Industrial Entomology, and Food Crops. The practical components are generally feasible and relevant, which supports effective learning. However, stakeholders have identified several areas where the curriculum could be improved to avoid redundancy, enhance practicality, and better serve students' learning needs.

Repetition and Overlap in Subject Content

A significant concern is the frequent repetition of subject matter and practical exercises across different grades and subjects, often under different course titles. For example:

- The effect of climatic factors on crop production is covered both in the Principle of Agronomy (Grade 9) and again in Basic Horticulture.
- Farm mechanization content appears in Grade 9's Principle of Agronomy but is also thoroughly covered in Farm Machinery and Seed Technology in Grade 11.
- Practical exercises such as seed sampling and germination tests are repeated across multiple subjects, including Principle of Agronomy, Farm Machinery and Seed Technology, and Vegetable and Medicinal Plant Production.

Hereunder, we have compiled and presented a more specific instances where topics and practical are repeated unnecessarily:

Class	Subject	Subunit/Practical	Remark
9	Principle of Agronomy	2.4 Effect of climatic factors	Repeated in Unit 2 of Basic Horticulture
		Unit 8 Farm Mechanization	Repeated in Farm Machinery and Seed Technology of Grade 11
	Practical	1.3 Seed sampling and germination	Common across multiple subjects (practical no 7 of subject principle of agronomy and practical no 7 of farm machinery and seed technology, practical no. 2 of vegetable and medicinal plant production)
	Basic Horticulture	Unit 6 Plant growth and development	Repeated in unit 8 propagation of seed from Floriculture and Nursery Management of class 10, unit 7 seed dormancy from farm machinery and seed

Class	Subject	Subunit/Practical	Remark
			technology of class 11.
		Unit 8 Harvesting and post-harvest handling of fruits	Covered in Commercial Fruit Production and Post-Harvest (Grade 11)
	Practical	Visit to nearest organic farm (Practical no 3)	Not feasible for all schools
		Practical no. 6,7 and 8	It is covered by the fruit production and post harvest
	Plant Protection		Mostly covered by Agriculture Entomology (Grade 11) and Plant Pathology & Mushroom Production (Grade 12)
10	Industrial Entomology & Fish Culture		Syllabus is well-aligned with CTEVT
	Practical	Practical no. 2 Mulberry cultivation and Practical no. 5 drag net preparation	Not feasible in many schools
	Horticultural Crop Production	Units 3-11	Content overlaps with Commercial Fruit Production (Grade 11) and Vegetable & Medicinal Plant Production (Grade 12)
	Practical	Cultivation of sub-tropical fruit crops	May not be appropriate for all schools

Class	Subject	Subunit/Practical	Remark
	Floriculture and nursery production	Practical no. 2 prepare landscape design for residential	May not be possible
11	Farm Machinery and Seed Technology	Unit 7 Seed Dormancy	Repeated from Basic Horticulture (Grade 9)
	Practical	Practical no 7 Germination test	Common practical repeated
	Commercial Fruit Crop Production	Unit 3 Cultivation of fruit crops	Overlaps with Horticultural Crop Production (Grade 10)
	Practical	Practical no 4 and 5	Common practical n basic horticulture
12	Industrial Crop Production	Unit 6 Cultivation of turmeric and ginger	Content overlaps with Vegetable Production (Grade 10)
	Vegetable and Medicinal Plant Production	Unit 3 Climatic factor	Repeated content
		Unit 4 cultivation practice of vegetables	Common to unit 8,9,10and 11 of food crop production of class 10
	Plant Pathology and Mushroom Production		Mostly repeats content from Food Crop Production

This overlap can lead to student fatigue and inefficient use of instructional time. I believe a thorough curriculum revision is needed to consolidate overlapping content and practicals, ensuring each subject offers unique and progressive learning experiences.

Practical Limitations

Some practical activities outlined in the syllabus are difficult to implement in many community schools due to resource constraints. For instance, visits to organic farms, mulberry cultivation, drag net preparation, and landscape design may not be feasible for all schools. These practicals should be reconsidered or replaced with more accessible alternatives that still provide meaningful hands-on experience.

Curriculum Alignment and Progression

While the Agricultural Extension and Computer Science subject is well-aligned with CTEVT and requires no changes, other subjects such as Basic Horticulture, Plant Protection, and Horticultural Crop Production show content overlap with higher-grade courses like Commercial Fruit Production, Plant Pathology, and Agricultural Entomology. This indicates a need to better differentiate the curriculum across grades to avoid repetition and to ensure a logical progression of complexity and depth.

Suggestions

- **Curriculum Streamlining:** Review and revise the curriculum to eliminate redundant topics and practicals across grades 9 to 12, focusing on unique, grade-appropriate content.
- **Practical Feasibility:** Adapt practical exercises to the realities of community schools, ensuring all students have equitable opportunities for hands-on learning.
- **Progressive Learning:** Design the curriculum to build progressively from foundational concepts in lower grades to advanced topics in higher grades, avoiding overlap.
- **Resource Support:** Provide schools with guidelines and support to implement practicals effectively, considering local contexts and available facilities.

Conclusion

Overall, the participants appreciated the solid foundation the program provided but recognized the need for thoughtful revision to enhance its coherence, practicality, and relevance. By addressing content repetition, adapting practical activities, and ensuring a clear progression of learning, we can improve the educational experience for students and better prepare them for careers in agriculture and related fields.

Civil Engineering

The participants have shared several critical areas that require improvement to enhance the quality and effectiveness of the Civil Engineering Program.

Uniformity and Structure of OJT

One of the most pressing issues is the lack of uniformity in On-the-Job Training (OJT) across institutions. From my experience, OJT should be standardized with clear hour requirements: 300 hours in Grade 10, 300 hours in Grade 11, and 600 hours in Grade 12. This consistency would ensure that all students receive adequate practical exposure and skill development throughout their studies.

Financial Support for OJT

Currently, the financial burden of OJT often falls on students or schools, which limits the quality and accessibility of practical training. I strongly believe the Ministry of Education should collaborate with local governments to provide financial support for OJT, backed by a clear rationale. This would motivate institutions and students alike, ensuring better implementation of practical training components.

Curriculum Modernization

The surveying course, a core part of civil engineering education, still includes outdated topics such as plane table surveying. It is essential to update the curriculum by removing obsolete subjects and incorporating modern technologies like drone engineering. This would better prepare students for current industry demands and technological advancements.

Language Instruction Optimization

An instructor shared, *"In my observation, teaching Nepali and English in both Grades 11 and 12 creates redundancy and overload. It would be more efficient to offer these language subjects in only one of the two grades, allowing students to focus more on technical subjects without compromising language proficiency."*

School Affiliation and Governance

Many schools currently hold affiliation only from municipal authorities (a school in Bhaktapur was operating this program with approval from the municipality, whereas it has already been running a parallel CTEVT program), which restricts their recognition and access to resources. The process for obtaining affiliation from federal and provincial governments should be actively resumed and streamlined to ensure these schools can fully participate in and benefit from the national technical education framework.

Unified Technical Education System

Finally, the existence of two separate technical education systems in Nepal creates confusion and inefficiency. Headteachers and instructors strongly supported merging these parallel systems into a single, unified technical stream. This integration would streamline administration, standardize quality, and provide clearer pathways for students and educators alike.

Conclusion

Reflecting on the concerns raised above, it appeared that addressing these areas will significantly improve the Civil Engineering program's relevance, quality, and impact within the Grades 9–12 Technical Stream. By standardizing OJT, modernizing curricula, optimizing language instruction, enhancing governance, and unifying technical education systems, we can better equip students for successful careers in civil engineering and contribute to Nepal's broader development goals.

Areas for Improvement in Both Curricula

Based on the comparison of the CDC and CTEVT curricula, several areas for improvement emerge to enhance the relevance, coherence, and effectiveness of both educational programs.

First, there is a need to address gaps in content coverage, particularly in subjects that build broader competencies. For example, the absence of Social Studies in CTEVT curricula, which is present in CDC's Grade 12 technical stream, represents a missed opportunity to develop civic awareness and democratic values among TVET students. Integrating such subjects in CTEVT programs could foster more socially conscious graduates who are better prepared to contribute to community development alongside their technical skills.

Second, both curricula could benefit from better vertical alignment and content sequencing. While CDC focuses on foundational theoretical knowledge and CTEVT emphasizes applied skills and specialization, clearer articulation of prerequisite knowledge and progressive skill development would facilitate smoother student transitions. For instance, subjects like Computer Application are treated differently—offered as a specialization in CDC but as a core course in CTEVT—indicating potential for harmonizing content to avoid redundancy or gaps.

Third, expanding the practical and contemporary components in CDC curricula, such as introducing more applied technology courses or entrepreneurial skills, would better prepare students for the demands of diploma-level training and the labor market. Conversely, CTEVT curricula could strengthen foundational scientific concepts to ensure students have a solid theoretical base, which supports lifelong learning and adaptability.

Fourth, both curricula would benefit from periodic review and stakeholder engagement—including industry, educators, and students—to ensure content remains relevant to evolving economic and technological contexts. Incorporating competency-based approaches and integrating emerging topics such as digital literacy, sustainable practices, and innovation could further enhance the curricula's responsiveness and impact. Moreover, adopting a feedback-driven and iterative curriculum development process that actively collects and integrates input from industry, students, and educators fosters a dynamic and responsive educational environment.

Fifth, to enhance the relevance of both CDC and CTEVT curricula, systematic integration of industry feedback is essential. Regular consultations with professionals from key sectors would allow curriculum developers to identify skill gaps, incorporate new technologies, and adjust course content to reflect real-world practices and expectations. Inviting industry experts to participate in curriculum review panels or deliver guest lectures can further enrich the academic programs with practical perspectives.

Sixth, incorporating experiential learning opportunities such as internships, apprenticeships, and real-world project collaborations with industry partners can bridge the gap between theory and practice, this is especially relevant to CDC curriculum. These engagements enable students to apply their knowledge in authentic settings, develop transferable skills, and build professional networks that facilitate workforce entry. Faculty collaboration with industry on research and development projects can also inform curriculum updates, ensuring content remains aligned with technological advances and market demands. Emphasizing interdisciplinary and project-based learning, inspired by industry challenges, can cultivate critical thinking, problem-solving, and teamwork skills highly valued by employers.

Across provinces and programs, participants advocated for:

- More industry-relevant topics and digital integration
- Increased practical training and internships
- Regular curriculum revisions with stakeholder input
- Clearer alignment of learning outcomes between CDC and CTEVT programs

A headteacher from Koshi Province emphasized the need for harmonization, *"Harmonizing CDC and CTEVT curricula is crucial to avoid redundancy and ensure smooth transitions. This can be achieved by aligning learning outcomes, integrating shared modules, and involving industry experts. Joint curriculum reviews would ensure consistency and relevance*."

There is a strong call for better alignment and possible integration of CDC and CTEVT programs, with suggestions for a unified policy, common standards, and coordinated management. Fragmented governance is a known barrier to effective TVET reform (Bhatta, 2021; Renold et al., 2021, 2024).

A teacher from Dadeldhura reported that "*Some programs are distributed in locations where there are overlap between CTEVT and CDC; and some schools are offering programs which do not have immediate market relevance – which has hampered practical and field-exposure.* This idea was also supported by earlier NEB report (2022).

Both CDC and CTEVT programs report that course content is often too advanced for the grade level, across all programs. For example, a Civil Engineering program (CDC) teacher from Achham shared, "*Some course contents are very tough for the 9th grader as the chapter of drawing is rather tough for them*." Likewise, a teacher from Baitadi (Civil/Computer program of CTEVT) shared, "*Since the students come with low academic profile, the contents are a way too difficult for them."* This is echoed in the literature, where curriculum overload and misalignment with student capacity are recognized barriers to effective vocational education in developing contexts (Motsatsi, 2024; OECD, 2020; Peng et al., 2023).

Teachers suggested moving specialized courses like AutoCAD to higher grades, adding entrepreneurship, and contextualizing or removing less job-relevant subjects such as Industrial Entomology and Fish Culture. They also suggest increasing practical content and integrating safety and health hazard education. Likewise, students expressed the need for more agriculture-related courses (e.g., vegetable farming, fruit production), reducing general subjects like computer science, mathematics, physics, and chemistry, and incorporating social studies and applied mathematics to better suit their interests and perceived job market relevance.

Both curricula require better vertical alignment and consistent sequencing to avoid redundancy and gaps. Harmonizing core subjects like computer applications and mathematics will facilitate smoother student transitions and skill progression.

Based on the stakeholder feedback, we can say that improving content integration, ensuring social and civic education, aligning theoretical and practical learning, and fostering continuous curriculum development are key areas to enhance the quality and coherence of both CDC and CTEVT curricula. These improvements will support the development of skilled, adaptable, and socially responsible graduates ready to meet Nepal's current job market challenges.

CHAPTER IV
FINDINGS, CONCLUSION AND RECOMMENDATIONS

Summary of Findings

The findings of this study have been organized aligning with the objectives of the study. Moreover, some other findings related to overall program effectiveness (as extended scope of this study) have also been put hereunder:

Objectives	Findings
To evaluate and analyze the existing curriculum of both the technical stream at the school level (grades 9-12) and the pre-diploma and Diploma levels of CTEVT to identify any gaps, overlaps, or inconsistencies in the content	**1. Content Sequencing and Progression Issues** • **Illogical Sequencing:** In some subjects, foundational contents are placed in higher grades while complex topics appear earlier (e.g., EMI in Grade 11 vs. Electrical Machines in Grade 10 in Electrical Engineering; repetitive programming basics in Grades 9,11,12 in Computer Engineering). • **Vertical Progression Lacking:** Similar foundational content repeated under different course titles without progressive depth (e.g., repeated topics in Plant Science across grades 9-12 like seed testing, climatic factors, farm mechanization, fruit cultivation). • **Inconsistent Difficulty Curve:** Courses sometimes become disproportionately harder without adequate foundational preparation (e.g., concerns about student preparedness in EE, CE). **2. Significant Content Overlaps and Repetition** • **Within Streams:** Extensive duplication of topics and practicals across different subjects and grades, particularly in **Plant Science** (e.g., seed germination tests, effect of climate, farm mechanization, fruit/vegetable cultivation covered multiple times) and **Computer Engineering** (core programming concepts repeated across C, Java, Visual Programming courses). • **Between Streams:** While overall alignment exists, differences in

	presentation, sequencing, and perceived depth create inconsistencies between CDC and CTEVT curricula. **3. Gaps in Curriculum Content** • **Relevance Gaps:** Content not aligned with likely career paths (e.g., Electrical Engineering focuses on large industrial machines vs. needed household appliance repair; lack of modern tech like drone surveying in Civil, industrial automation in EE). • **Practical Skills Gaps:** Insufficient emphasis on hands-on application compared to theory across most programs (electrical, Computer, Animal Science, Civil). OJT implementation is weak across programs, somewhat better in city areas. • **Modern Industry Gaps:** Missing contemporary topics crucial for employability (e.g., Industrial Automation in EE; modern surveying tech in Civil; actual application development in "Web and Mobile Application" in Computer Engineering). **4. Inconsistencies in Structure and Presentation** • **Course Title vs. Content Mismatches:** Titles promise skills not covered (e.g., "Web and Mobile Application Development" lacking development tasks in Computer Engineering; misspelled titles like "Data Based"). • **Combined vs. Separate Subjects:** Logically distinct topics bundled into single courses, hindering depth (e.g., Data Structures & OOP; Digital Design & Microprocessor – Computer Engineering). • **Inconsistent OJT Implementation:** Lack of standardized hours, scheduling, workplace coordination, and financial support across programs and schools (Civil, Animal Science). • **Arbitrary Subject Placement:** Topics like earthing repeated across grades unnecessarily (Electrical Engineering), while language subjects (Nepali/English) taught redundantly in both Grades 11 & 12.

To identify specific areas for improvement in the contents of the curriculum of both the technical stream at the school level (grades 9-12) and the pre-diploma and Diploma levels of CTEVT	1. **Curriculum Content** • **Re-sequence Subjects:** Swap EMI to Grade 10 and Electrical Machines to Grade 11 for logical progression. • **Consolidate & Remove Redundancy:** Eliminate repeated topics/practicals (especially Plant Science, Computer Engineering programming basics). Merge overlapping subjects (e.g., math options in Animal Science). • **Update & Modernize:** Remove obsolete content (e.g., plane table surveying - Civil); add critical modern topics (Industrial Automation in grades 11 or 12 in Electrical Engineering; drone tech, modern frameworks - Computer/Civil). • **Align Content with Career Realities:** Shift focus to relevant skills (e.g., household appliance repair in Electrical Engineering (e.g. heaters, fans, LED TVs); actual application development in Computer Engineering). • **Separate Combined Courses:** Split bundled topics into distinct courses for focused learning (e.g., Data Structures & OOP – Computer Engineering). • **Rationalize General Subjects:** Reduce overload of general subjects (esp. Animal Science) to prioritize technical skills. Optimize language instruction (e.g., teach Nepali/English in only one of Grade 11/12 - Civil). • **Clarify Titles & Content:** Ensure titles accurately reflect content and learning outcomes (Web and Mobile Application Development in Computer Engineering). Consolidate earthing content in Grade 9 and reserve lighting arresters for grade 10 (Electrical Engineering). Refocus Electrical CAD to emphasize electrical drawings only. 2. **Balance of Theory and Practical** • **Enhance Practical Relevance:** Ensure practicals are feasible, accessible, and industry-relevant (e.g., replace impractical Plant

	Science practicals; add hands-on like distribution transformers handling, economic voltage calculations in Electrical Engineering). • **Strengthen OJT:** Standardize hours (e.g., Civil: 300hrs Grade 10, 300hrs Grade 11, 600hrs Grade 12); secure financial support; improve workplace coordination & policy; schedule effectively (avoiding exam times). **3. Monitoring and Support** • Monitor the use of practical guidelines and proper implementation of the practical and project works, including OJT. • Provide intensive teacher support on implementing the practical components.
Program effectiveness related findings	1. Curriculum Satisfaction and Implementation • The majority of schools expressed satisfaction with the current curriculum, identifying implementation as the main area needing improvement. Effective curriculum delivery is seen as dependent on regular monitoring and evaluation by relevant authorities. 2. Teacher Perspectives and Student Preparedness • Most teachers responded positively to the curriculum; however, some expressed concerns that the courses may be too challenging for students with lower academic backgrounds who are unfamiliar with technical subjects or that they do not have adequate foundational knowledge required for the courses. • Despite these challenges, the curriculum is viewed as beneficial for student learning. However, student dropouts are observed – which are often attributed to content overload, complexity of the core academic subjects. 3. Coherence and Consistency in Course Content • There are no major mismatches in course topics, but differences in sequencing and coherence between CDC and CTEVT curricula were noted. Subject experts reported a need for resequencing/re-

	organizing some contents within the courses or across grades (as indicated above). 4. Operational and Structural Challenges • Challenges include high teacher turnover, declining enrollment rates, limited coordination with employers and industries, and issues with work-based learning components such as on-the-job training (OJT) and internships. • While the curriculum provides a structured framework for stakeholders, its implementation has not been as effective as intended. 5. Policy and Administrative Issues • A few schools run both the 9–12 technical stream and pre-diploma/diploma programs in the same classrooms, contrary to policy. This raises questions about affiliation and accreditation processes. This also indicates a need for streamlining the two programs. • Proper separation of administrative spaces is needed to maintain discipline and quality. 6. Views on Curriculum Alignment • Regardless of modality, both streams aim to develop skilled individuals for the labor market. Some respondents expressed concerns about introducing a common curriculum. • There is a strong call for better alignment and possible integration of CDC and CTEVT programs.

Conclusion

Nepal's technical education landscape—anchored by the CDC technical stream (Grades 9–12) and CTEVT's pre-diploma and diploma programs—holds significant promise for workforce development, youth empowerment, and rural prosperity. While the CDC stream provides a strong academic foundation and increasing accessibility, it faces persistent challenges in practical skill development, content relevance, and alignment with CTEVT's more practice-oriented curriculum.

The comparative analysis reveals that while curricular contents across both systems are broadly aligned in theme and intent, direct course-to-course alignment remains inconsistent. CTEVT programs generally offer greater breadth and depth, with stronger emphasis on hands-on learning and industry readiness. In contrast, CDC curricula tend to be more academically focused, often lacking sufficient practical integration and vertical progression.

Implementation challenges—such as teacher shortages and turnover, inadequate materials, weak industry collaboration, and underutilized laboratories—are common across both systems and hinder the full realization of curriculum goals. Moreover, structural issues like overlapping affiliations, inconsistent OJT delivery, and disparities in administrative practices further complicate program coherence.

To enhance the effectiveness and impact of technical education in Nepal, the study recommends a multi-pronged reform strategy, including a) **Curriculum Harmonization**: Align CDC and CTEVT programs more closely in content, sequencing, and learning outcomes, b) **Practical Integration**: Increase the weight and feasibility of practical components, including standardized and well-supported OJT, c) **Content Modernization**: Update curricula to reflect evolving industry demands, including emerging technologies and career-relevant skills and d) **Structural and Policy Reforms**: Streamline governance, ensure proper affiliations, and address disparities in the implementation of the practical components. These reforms are essential to build a coherent, responsive, and inclusive technical education system that prepares graduates not only for employment but also for meaningful contributions to national development. With sustained investment, strategic alignment, and collaborative implementation, Nepal can unlock the full potential of its technical education programs.

Recommendations

Based on the findings of the study following recommendations are made for different stakeholders:

For Curriculum Development Centre

- Carefully check the major areas for improvement (findings 2) and address curriculum content and structure related issues, some of these include:
  - Reorganize subject placement to ensure logical progression (e.g., EMI before Electrical Machines).
  - Eliminate repeated topics and practicals across grades and subjects (especially in Plant Science, Electrical engineering, and Computer Engineering).
  - Make the core academic subjects more applied relevant to the discipline in focus (e.g., Engineering math).
  - Introduce modern, career-relevant topics (e.g., Industrial Automation, drone technology, application development frameworks)
  - Ensure course titles reflect actual content and learning outcomes (e.g., revise “Web and Mobile Application Development”)
  - For OJT, standardize hours (e.g., 300hrs Grade 10, 300hrs Grade 11, 600hrs Grade 12) and tentative calendar months so as to facilitate having similar program structure across schools; ensure program completion within 3 months of Grade 12 examination. This may require some course adjustment in grade 10 and 11 to allow at least 6 months window for OJT within grade 12.
- Replace impractical exercises with accessible, industry-relevant alternatives or provide schools with guidelines on adapting the practical exercises to fit their context.
- Provide structured micro-syllabi to guide teaching and assessment.
- Regularly evaluate curriculum delivery and monitor practical implementation, including OJT.

For CTEVT

- While maintaining strong practical training, reinforce foundational scientific and theoretical concepts in a balanced way to support lifelong learning and adaptability.

- Expand partnerships with industries to improve internships, on-the-job training (OJT), and employment pathways for graduates.
- Integrate subjects like Social Studies to develop graduates who are not only technically skilled but also socially responsible.

For CDC and CTEVT (Both)

- Align curriculum content and learning outcomes of both programs to ensure consistency, reduce redundancy, and facilitate smooth student progression between the two streams.
- Jointly conduct a thorough program mapping and consider program re-distribution based on changing market needs (feasibility).

For MoEST/CEHRD

- Establish a unified governance and monitoring framework that coordinates CDC and CTEVT programs to avoid duplication, streamline resource use, and ensure coherent policy implementation.
- Allocate adequate funding and resources to improve infrastructure, teaching materials, and qualified human resources, particularly in remote and underserved areas.
- Conduct a re-assessment of the CDC and CTEVT programs (not just content harmonization) for possible integration of them and the approach of operating a single stream technical and vocational education at the school level.

For Provincial Governments

- Promote coordination between CDC- and CTEVT-affiliated institutions in the province to ensure curricular coherence and relevance across technical stream and CTEVT programs.
- To assess and map the distribution of technical education programs in alignment with provincial labor market needs, and to coordinate with the CDC and CTEVT for the rational redistribution and alignment of programs within the provinces.

For Local Governments

- Encourage and support local businesses and industries to collaborate with schools and CTEVT institutions for practical training, apprenticeships, and employment opportunities.

- Actively participate in monitoring and supporting the quality and relevance of technical education programs within their jurisdictions.
- Work with schools and education authorities to raise awareness about the benefits of technical and vocational education in local communities, fostering positive attitudes and support.

For Schools

- Address frequent teacher turnover by improving recruitment, training, and retention strategies to ensure continuity and quality in technical education delivery.
- Maximize use of available facilities for hands-on training and seek partnerships with local industries for internships and practical exposure.

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ANNEXES

Annex I: Desk Review Matrix

Subject area 1	**(e.g. Plant Science)**			
Key Contents	**Technical Stream Curriculum**	**TECS Curriculum**	**Alignment/Gap Analysis**	**Recommendations for Harmonization**
This column lists key subject areas or topics to be analyzed from both curricula.	Use this column to indicate whether the specific content is present in the curriculum for grades 9–12 (e.g., ✔ for present, ✖ for absent, or brief description of coverage).	Use this column to indicate whether the specific content is present in the TECS curriculum (e.g., ✔ for present, ✖ for absent, or brief description of coverage).	Evaluate how well the content aligns across the two curricula: are there gaps (missing content), overlaps (redundant content), or differences in depth/approach?	Propose evidence-based recommendations to address gaps, avoid redundancies, and improve alignment for smoother transitions between programs.

(Detailed filled in matrix is submitted separately as an Excel file)

Annex II: Participatory Consultation Guidelines

FGD With Teachers

1. Based on your experience and observation, how do you evaluate the overall curriculum effectiveness of your respective program? (content overload, content insufficiency, outdated contents, etc.)
2. How do you perceive the alignment between the two curricula (CDC grades 9–12) and CTEVT pre-diploma and diploma-level curricula)?
3. If you've observed both curricula, can you indicate some gaps, overlaps, or inconsistencies in the curriculum (in terms of focus – academic, entrepreneurship, career, etc., weightage, practicality, content coverage, etc.)?
4. **To Plant/Animal Science teachers only**: Could you clarify whether and how some contents like apiculture, sericulture, lac culture, aqua-culture, animal husbandry, and beekeeping) fall within the scope of plant science?
5. In your opinion, what areas of your program curriculum require improvement? (theory/practice weightage, internship and OJT, collaboration with industries, incorporation of soft skills, updates on contents to better address changing market needs, difficulty level of contents, etc.) Why is it necessary?
6. Do you think it is necessary to align (the contents of) these two curricula? If yes, how?
7. Do you have any suggestions to improve the current curriculum, esp. in terms of breadth and depth of contents?

FGD With Students

1. Can you tell us something about the technical program you're studying? Why did you choose this program?
2. How familiar are you with the contents covered by your program curriculum? Are they sufficient to equip you to become a good graduate – ready for job market or for higher studies (might also be overloaded or scarce)?
3. Have you also observed the curriculum of the technical stream or CTEVT's pre-diploma and diploma programs? If yes, what is your assessment (esp. in terms of scope and content coverage) between these two curricula?
4. Which subject areas do you find the most or least useful for career readiness or for higher studies?
5. Is there any content area (subjects) you think might not be necessary for your program? Why?
6. What additional content areas do you think should be incorporated to make the current curriculum more competitive?
7. How do you assess the theory/practical as well as internship/OJT components of the courses? Why do you think they are okay or not okay? What do you suggest for improvement?

KII with Headteachers

1. How do you evaluate the overall curriculum effectiveness of your respective program? (content overload, content insufficiency, outdated contents, etc.)?
2. If you've observed both curricula (CDC grades 9–12) and CTEVT pre-diploma and diploma-level), can you indicate some similarities and differences in the curriculum (in terms of focus, weightage, practicality, content coverage, etc.)?
3. In your opinion, what areas of your program curriculum require improvement? Why is it necessary?
4. What policy or curricular changes would you recommend for aligning (the contents of) these two curricula?

FGD With SMC/Parents

1. Can you tell us about the technical stream or CTEVT's programs being offered by the school?
2. Why did you send your children to this program? What do you think the programs will help the students to achieve/become?
3. Have you found the program/courses helping your students achieve that aim?
4. Do you have any suggestions to improve the program?

KII with Local Level Education Officials

1. What is your understanding of the alignment between the CDC and CTEVT curricula? (What makes these curricula distinct?)
2. Have you received feedback on gaps in curriculum content? Can you share some of them?
3. In your opinion, what are the key competitive advantages that pre-diploma or diploma program students have over the technical stream or vice-versa?
4. Do you think it is necessary to align (the contents of) these two curricula? If yes, how?
5. Do you have any suggestions to improve these curricula (or the one you're more familiar with?

KII with CDC/CTEVT Stakeholders

1. How do you see the parallel running of technical stream and CTEVT programs? How are they distinct and needful?
2. Could you tell us about any gaps or inconsistencies between the two curricula, or within the curriculum that your institution is promoting?
3. **Subject committee:** Any strengths or gaps between your curriculum and similar course offered through CDC or CTEVT?
4. **Subject committee:** What changes (content adjustment) do you think is required to your courses?
5. Do you think it is necessary to align (the contents of) these two curricula? If yes, how? Are there already any efforts made or planned to ensure alignment between the two curricula?

6. What specific content areas do you think require improvement or harmonization? How can that be initiated?
7. Any idea that would be helpful to align the curricular contents (e.g. co-designing a few common courses as fundamental to a stream, and sharing a framework for specialization courses that CDC and CTEVT may choose to introduce)?
8. Do you have any suggestions that would help re-organize the existing two programs?

KII with CEHRD/MoEST Stakeholders

1. How do you see the parallel running of technical stream and CTEVT's pre-diploma/diploma programs? How are they distinct and needful?
2. What is your perspective on curriculum alignment between the two programs?
3. Can you tell us about any gaps or inconsistencies between the two curricula?
4. What are the key competitive advantages that technical stream students have over the pre-diploma or diploma program or vice-versa, esp. in terms of content knowledge and skill mastery?
5. What are the challenges in implementing curricular reforms to harmonize these programs?
6. Do you have any ideas that would help re-organize the existing two programs? How can we ensure the alignment supports student career readiness and progression to higher education?

Annex III: Sample Schools and Programs

SN	Schools	Province	School Types	Program
1	Rastriya MaVi, Kailali	Sudurpashchim	CTEVT	Animal Science
2	Birendra Secondary School, Baitadi		CTEVT	Computer/Civil Engineering
3	Mangala Rastriya MaVi, Achham		CDC	Civil Engineering
4	Bhageswor MaVi, Parshuram M., Dadeldhura		CDC	Plant Science
5	Nirajan MaVi, Salyan	Karnali	CDC	Animal Science
6	Saraswati MaVi, Tila, Humla		CDC	Plant Science
7	Shiva MaVi, Surkhet		CTEVT	Plant Science
8	Kalika M. MaVi, Rupandehi	Lumbini	CDC	Computer Engineering
9	Gautam Buddha Mavi, Kapilvastu		CDC	Civil Engineering
10	Rapti Engineering College, Dang		CTEVT	Computer/ electrical/civil Engineering
11	Chure Secondary School, Bardiya		CTEVT	Animal/ Plant Science
12	Dhaulagiri Birendra MaVi, Baglung	Gandaki	CDC	Animal Science
13	Takam MaVi, Myagdi		CDC	Electrical Engineering
14	Ramkot Secondary School, Rupa RM, Kaski		CTEVT	Plant Science
15	Adarsha MaVi, Bhaktapur	Bagmati	CDC	Computer Engineering
16	Janasewa MaVi, Kirtipur/Kathmandu		CDC	Electrical Engineering
17	Vishwaprakash Secondary School, Bharatpur, Chitwan		CTEVT	Civil Engineering
18	Kshamawati Secondary School, Bhimeswor Dolakha		CTEVT	Plant Science
19	Nepal Rastriya MaVi, Bara	Madhesh	CDC	Computer Engineering
20	Janajyoti MaVi, Lalbandi, Sarlahi		CDC	Plant Science
21	Janata MaVi, Bardibas, Mahottari		CDC	Animal Science
22	BP Smirti Polytechnic Institute, Dhanusha		CTEVT	Plant Science / animal Science / civil/ electrical Engineering
23	Public MaVi, Dharan	Koshi	CDC	Electrical Engineering
24	Phidim MaVi, Panchthar		CDC	Civil Engineering
25	Tehrathum Polytechnic Institute, Aatrai Tehrathum		CTEVT	Animal/ plant Science
26	BP Koirala Sewa Kendra, Sunwarshi, Morang		CTEVT	Civil/Computer/ Electrical Engineering

Annex IV: Program-wise SWOC Analysis

Plant Science

Strengths	Weaknesses
• Easy accessibility for TVET program • Curriculum as a policy document • Resources as books, materials and equipments are all in place for proper use • Courses for decent employment • Learning environment in the agri-farm	• Not managing theoretical and practical based learning protocol • Agri-businesses and industries rarely found in the nearby location of school • Timely assessment of students and teachers • Course calendar to be maintained • Regular meeting with local stakeholders
Opportunities	**Challenges**
• TECS modality and 9-12 technical stream program reached in the local level • Fertile land for practical exercise and the session • Students can be benefitted upon production of the crops and vegetables • Real time learning mechanism and offer • further study together with hands on skill	• Unavailability of the subject of interest • Declining population in the community level • Output based assessment system • Courses are many and output expectation • Proper sequencing and management of the curriculum

Animal Science

Strengths	Weaknesses
• Animals including pets have been treated • Learning with theoretical approach prior going to the field • Lab materials and text book and others are adequately available • Course is the interest of community itself • Teaching and learning environment	• Accessibility for OJT and internship • Revised and updated curriculum • Internal management and leadership role • Excessive content of the subject area • Regular meeting for program achievement
Opportunities	**Challenges**
• Free education for all 9-12 technical stream • Enrollment to BSc Ag and other university degree • Resource materials are available for the practical session • Easy employability upon matched skills • Work based learning and required theory	• Timely revisiting of the existing curriculum • Farmers are also leaving the existing profession of agriculture • Drop out in the middle of the session by students • Regular teaching faculty • Matching course content of Animal science of CDC and CTEVT for common achievement

Computer Engineering

Strengths	Weaknesses
• Theory and practical proportion in CDC is 50-50 respectively • Faculties are competent • School facility is adequate for teaching and learning • Laboratory facility well functional • Enterprise development and motivation	• Vertical curriculum • Insurance for safety and health hazard • OJT and internship database management • Regular and timely revision of the course and curriculum • Practical session is not functional and effective
Opportunities	**Challenges**
• Funding for CDC and some scholarship opportunity for CTEVT • Machine learning and better output • Enhances the efficiency for other general tasks as well • Quick and efficient learning model • Go for BE and other similar bachelors degree	• Safety and health hazard consideration in the practical • Businesses and industry linkage for work-based learning • Consistency in the course • Research and development • Students enrollment is in declining trend

Civil Engineering

Strengths	Weaknesses
• Most demanding area of engineering • Drawing with different software has effective learning outcome • High employment record • Practical based curriculum • Highly effective curriculum in comparison	• Calendar to be maintained well for both internal and external assessment • Periodical as well as regular revision of the curriculum for its effectiveness • OJT record to be maintained • Idea on similar another curriculum • Enhancing practical session for skill
Opportunities	**Challenges**
• Easy and flexible instructors • Easy employability and better livelihood • Coordination and collaboration with other businesses and industries for work-based learning • easy and decent employment • Go for further study for sure	• Old curriculum and not revised for a long • Heavy course load for structure design • Complex course and make it relatively simplified • Teacher's turnover and retention management • Decreasing students' enrollment trend

Electrical Engineering

Strengths	Weaknesses
• Demanding course in the community as well as the country • Graduates are all engaged at least with one area of profession	• Food and accommodation facility for the students-residential • Learning materials and equipment to be adequate • Course is harder

• Graduates are employed either job or in any other profession • Hydropower companies are mushrooming • Enjoying the profession a lot	• Base course for 9-12 technical stream to be stronger • Timely revised curriculum is must
Opportunities	Challenges
• Free and easy to switch to bachelor's degree as they could be engineering or any other relevant and the subject of choice • Free education in the case of 9-12 whereas the program from CTEVT is also not much expensive • Per child fund and lab support money has further made this program effective • OJT and Intern if not available in the business and industry; there is a space for electric shop where students can have practical session with better learning • Not to remain unemployed or not establishing at least he least enterprise	• Students are getting less enrollment • Irregular turnover of the teachers • Students are enrolling from low academic profile and competency • Low student enrollment • Frequent teachers' turnover has made this program ineffective

Annex V: Datasheet of Stakeholder Perspectives

District	Program/ Curriculum	Teachers' view	Students' view	PTA/SMC view	Headteachers' view	Local Education Officer's view
Achham	CDC/Civil	1.Course is a bit difficult for the 9th grader as the chapter of drawing is rather tough for them. However all rests are fine 2. We can add up the content of civil rather cutting the course content of compulsory subjects as science, maths, Nepali and English 3. 4. No job guarantee for the teachers, old course and materials, almost no relationship with businesses and industries, the same old teachers for technical stream 5. Taking AutoCAD out from grade 9 and transfer to 11&12, course weightage from compulsory subject to be adjusted by adding some course for civil, practical should be more than the theoretical content 6. Different administration is required for technical stream not with general	1. Get a job soon, seniors studied, guardians suggestions, saw the engineers measure the road and there would be more practical in the study 2. We are habituated with the course as it used to be much harder earlier, also harder to go for higher studies, low practical and field visit, learning environment is not much 2. Not much knowledge on this area 3. Don't know 4. N/a 5. Field visit should be frequent for the learning outcome, Should not be acquainted with other general stream as it needs to be separate block in the school, we need to access with the municipality for our practical learning for stkills 6. We need to have vocational knowledge and skills by working in the field by direct involvement in the	1. Technical stream is rather better to the program for CTEVT as it is time consuming as they call enrollment only after SEE pass 2. Free education, job oriented study with high practical priority 2. Earlier it was so nice program as many of them got the government job, later because of poor labor market youths migrated for foreign lands 3. Rapid migration, low birth rate, poor labor market, beliefs with parents are declining on the program 4. Curriculum are	1. Course content for grade 9 is tough 2. It used to be much popular previously but it is declining because of the graduates not being engaged in the work place and their profession 3. Migration, low birth rate, low employability, low practical knowledge for skill generation, different study program to be introduced in the school as other engineering 4. It is hard to get the business and industry for OJT and Intern 5. Program with agriculture and	1.Students are getting depth knowledge on the course, they are sub overseer right after completing the 12th grade 2. It starts from grade 9 where is the program from CTEVT starts after grade 10 3. Program for technical stream (9-12) is free but students are still not much, teachers are not permanent, no labor market existed in the area 4. Parents are not having faith and belief in the program, labor market is not available, migration of the people are rampant 5. Constituent schools of CTEVT are better but TECS model program are not better to technical stream (9-12) 6. It should be aligned as a one door policy and it

		stream, financial source needs to be confirmed for the teachers overall remunerations, should not be any fees charged to the students 7. 4 years for overseer level course from grade 9 is great course comparing to CTEVT ones 8. Unhealthy competition should be closed and there are some schools running TECS model program in the mountainous region 9. Technical stream program as 9-12 is much better than CTEVT 10. Common standard of the program to be followed by both program 11. Since this is technical studies, practical knowledge for the skill development should be assessed	job and profession 7. It would be better if municipality involve us for our knowledge and skills we earned from the study, the students previously are better but it is declining now, not having bigger businesses and industries near by 8. We cannot force them to go with this program as the trend has seriously been to board for foreign land already 9. OJT and Internship are just to say and rarely for the implementation 10. We have not gone through the curriculum of CTEVT yet 11. We don't know much but it is good so far	fine but the instruments and equipment as a practical materials should be adequate for better learning outcomes 5. Teachers and instructors should be competent so that the learners would also be of that level accordingly 6. The government should take the whole charge of it as the graduates should have opportunity to work with the businesses and industries near by in the local level, teachers, students and parents should be aligned for the program in frequent manner, migration to be declining, The lands and	tourism should be promoted 6. I don't have compared these program but I like the course for 9-12 as it early starts from grade 9 which is good part of this program 7. Nepal Government should take care of it to revise the course and develop as it is required by arranging the workshop with the experts, coordination of the program is much needed, assessment of the program should also be revised	is also hard to run the private institute in the mountainous region of the country, 7. Practical knowledge by visiting differently similar area and the institute, curriculum should be aligned with labor market, practical knowledge should be higher than the theoretical ones

				properties that went waste should be taken by the government and start business on it.		
Dadeldhura	CDC/ Plant	1. High weightage of the course, Theoretical content is much, 9 subjects and 9 period for them, Technical training is less 2. Parents are not convinced with the learning from practical education, sequence of syllabus is not good 3. All the contents are falling under plant science 4. Poor coordination to implement the curriculum, lack of competent instructor, No mathematics subject in grade 9, 10 and 11, low consistency of teachers, practical materials are required to call from India 5. Subject with sugarcane need to be added, Mathematics from grade 9 to be added and the practical session should be well managed	1. To grow entrepreneurship in the profession and production of agri-products, Self employability concept, introducing indigenous agriculture system in the market 2. Course with horticulture need to be added, course with mathematics should be added from grade 9 3. All the subject matters in the course are relevant 4. Course with vegetable farm and fruit productions are needed to be added 5. The alignment between practical and theory exam is required, time duration for practical session is less 6. It is hard to go to district central office 7. This program helps one to become entrepreneur with the profession 8. Attractive course, helpful for living a good life and also	1. Pre-diploma and Diploma course should also be of 3 years 2. Attracting toward modern agriculture system 3. Participation and coordination of community, students are enrolling also by borrowing money from banks with some collaterals 4. Educational basement of students are poor, hard to retain the teachers, and it is urgent to start admission campaign 5. Curriculum is helpful for learning 6. Dedicated and	1. Text books are not in the proper sequence, books are in English and hard to understand the terminologies and competent students are mostly centered in the urban area 2. Program as such is attractive but it is not market oriented, Poor monitoring and evaluation from the examination board 3. Education and learning materials are not adequate, students from 2076 BS are enrolling other	1. Related with entrepreneurship and employment oriented program, ensure learning and earning mechanism and utilize and manage the time with production 2. Both entity have different curriculum management directives 3. CTEVT has better curriculum, teachers' manual, teachers feel ownership in the program as they have regular training, seminar and workshop in the program 4. Students are much oriented with the concept of flying abroad, low income generation in the family and community, text books and practical materials are much

		6. Lack of teachers manual and directives, No question pattern available, 7. Teachers are not serious for their job as they are preparing for other jobs around, 8. No alignment in the curriculums 9. Syllabus at grade 9 is much similar with the ones in grade 12 10. Conducting awareness and refreshment training timely 11. Course contents are not in depth, course should be aligned from the grade 9, students should be well aware with practical knowledge	helpful for income generation and livelihood of an individual 9. Lack of learning materials, irregular teaching staffs, need to go long distance for OJT	decided to go abroad, conduct awareness program with parents, need to clarify the subject matter with its scope, importance and rationale, need to conduct regular training, workshop and seminar	campus after their school graduation 4. Taking longer time to select teachers, lack of education and learning materials, office of agriculture is far 5. Some changes and improvement in the area of practical, improvement with questions for exam for the assessment process, regular monitoring and evaluation is required 6. Objectives and goals are almost same but teachers in the technical stream doesn't have opportunity to feel ownership with the program because i doesn't	expensive 5. The rate of employability in plant science and engineering is a bit high as the organizations are often needful of this type of people with the required skills 6. One door policy for both the program and department of education take the due charge of it, coordination between, province, district and local level is required 7. One municipality one technical school concept is required and the concept of one province level technical school is also required

					have separate block and overall management system separated 7. A common technical school so that both the stream can contribute for the common goals, Establish coordination between community and schools	
Baitadi	CTEVT / Civil-D, Computer-PD	1. Course content is market based, course is updated, students of low academic profile, course load is a bit high as student feels it 2. The course is all got but it would be more effective if certain relevant package is developed for better learning environment 3. N/a 4. Facility for teachers and their permanent status is much required, good collaboration with business and industry have been maintained 5. System analysis and the content with problem to be	1. Expecting job on the computer field, the world itself much focused with ICT, learning computer and it would be easier to get the work 2. Courses are all good only thing is we are not able to practice it for the skill development in us, computer is not available in all households of the students, course is somehow lengthy 3. Don't think so, many contents available in electro technology and computer hardware 4. they are expecting skill in	1. Students are scare and low rate enrollment is prevailing, 7 lakh fund is not enough to run the program 2. Just for easy employment expectation 3. No session has started now 4. Sheet migration of people, low population density, programs are many, not exactly the average and	1. Wrong practice capturing students with low grade, written test and theoretical knowledge is not matching 2. IT is being out on the choice of people, vocational education has not been that functional and in use as all of them are depend only on soft skills on	1. Don't know much but based on the information provided the course is good and effective which have been providing effective skills to the students 2. CDC is more academic and CTEVT is establishing the vocational skill individuals 3. CDC maintains the standard and quality and together work for physical service and human resource management whereas CTEVT is much focused

		avoided and software banking or the school to be added in the course, Course for practical exercise to be added and computer hardware to be made easy and convenient for better usefulness 6. Pre-diploma course should be more academic as the course is a bit long for short period, teachers are not permanent and people are required to visit center officer even for small help and service rather if it was in district level would be good 7. Students are choosing CDC one because it is academic, CTEVT is non academic, the product as a graduate if engaged with any job or profession the faith will be automatically there for it 8. Alignment of two program is must, one door policy to run the program would be much better both of them should be taken to the same umbrella 9. We don't know much about the curriculum of	ones and would be great if content is less 5. Practical exercise to be promoted and written test and exam should be gradually declining 6. Both theoretical and practical session is available, OJT is one of the most effective learning platform and generate after graduation 7. We are many as it is said he students previously was low, 18 months program is equivalent to TSLC 8. Teachers are there and computer is available in school lab but the students will not have computer in individuals, practicing based on the notes of teachers, practical session is conducted quite less, 10. No 11. Less content is also very good but whatever course is available the students should be good learner for the short course types like hardware, program, electrographic and web design etc.	above but average and below has been joining the session and fails the exam for many years that is also deteriorating the scenario of admission and enrollment 5. Course is good and those students who are sincere and serios on education can have better opportunity 6. Revenue is not being well generated, the available fund is not sufficient, either CTEVT itself of any authority by government is much required	bears 3. Supply of technical schools are high and demand is gradually getting low 4. Teachers should be well remunerated with salary and allowance that covers their minimum as well as familial obligations, the salary and facilities are declining after federal government started governing 5. Resources and human capital should be well managed after revising the policy as well, the program of CTEVT should also be recognized, practical part should be well	with vocational skill and dwelling with the poor investment in the program it has been affiliating to 4. Awareness on parents and children is poor and lack of competent and permanent teacher, the program authority is not seemed much responsible to manage all the available resource to run smooth program 5. CTEVT is to get skill on hand where as CDC is for academic soundness in ones 6. Both the program should be handled by one institute 7. For quality teaching and learning procedure the curriculum should cover both theoretical as well as practical session

		CDC but know a bit about the program as the course is more like academic, the government has invested a lot to it, saying the program non academic for CTEVT has made ineffective as well. 10. One organization should run these two program, fully academic and partially academic course should be segregated and short term training to be conducted for quick and effective skill generation, both written and skill test should be maintained 11. 18 months course to be revised for 2 years with adding some courses, emphasize for the short term course and government should invest much for the technical and vocational education and training			taught 6. Both of them have common goal as it is objected to develop the vocational skills in ones, the curriculum of CDC is much effective as level wise it is good and government also have put some effort to it 7. One door policy as one should have a leadership to be engaged to run both the program	
Kailali	CTEVT / Animal-PD &D	1. Course for first year is tough which students hardly comprehend the learning, students are also not serious, 2. ED and SM like subjects are not directly supporting	1. People feel the course will help for the employability, lack of consultant for counselling, to promote the business on animal science, 2. We know the course content, higher study	1. The course is nice but why I don't the students interest and its faith on them has been lost 2.	1. Curriculum should be reviewed and revised, 2. Program is much effective, the quality of	1. Technical education is like supporting gaining skill in one and s/he can sell the skill in the labor market and get benefitted independently

		students for their learning 3. Plant products are food products to animal and they are much interlinked each other 4. lack of permanent teacher and consistency in teaching, 3 months OJT is too short so at least 6 months OJT if available the learning in the participants will automatically rise, resource materials are not much available 5. Subjects like ED, SM and Statistics from 6th semester to be taken out and add the portion of animal health and some hours and days for effective OJT, No need to have detail study of rat instead add something for introduction part, course is old and need to revise as soon as possible 6. 7. 8. 9. No observed well but I know the courses in CTEVT are much expensive and practical oriented learning modality is present 10.	promotion and focus for practical session in the learning procedure 3. 4. Take out the content of optional maths and add more from compulsory mathematics 5. Results are often delaying and similarly the exam also to be scheduled on time, exempted schedule should also be timely settled, 6. Less theoretical and more practical session should be covered while providing learning procedure 7. Even the competent individuals are migrating abroad for the job of livelihood, unhealthy competition, youth force are producing in its pace but the quality below average 8. Assessment process is not in the process of common schedule as administration is helping to accomplish it on time as by developing question sets, do the results on time 9. Lack of permanent teachers, resource materials for teaching and learning		entrance exam should be easy, fees rate to be revised and students should be benefitted out of it as well 3. Fees are high, employment is not confirmed, no technology friendly, lack of fund for financing and investing, adequate materials for practical learning, library, lab are all good, when the schools are open in the middle of the city; it would be quite easier for them to explore ahead 4. The terminologies mentioned in the questions itself has the challenging in the study and subject	2. The program from CTEVT are much expensive and majority of the curriculum is common while learning 3. Students are getting high marks in practical on CDC, monitoring and evaluation from internally as well as externally have some differences, it the quota has been increased it would be easier for the overall management 4. All the old curriculum to be reviewed and improved as per the demand of the market 5. less time consuming, financial flexibility, easy to implement 6. Yes, curriculum can be revised and amended to align each other 7. The curriculum should be revised mainly based on the market demand

		11. The subjects under science has high scope and depth and people are not passing the result,	are scarce, similarly the applied resources are not well managed 10. The contents are different from pre-diploma course and it has more theoretical base and practical is less and diploma is relatively practical oriented study 11. the subjects like science and maths should be reviewed and revised properly and effectively		because the competent youth force is not interested to do the same. 5. Laboratory well equipped, library with very nice books of multiple areas, enhancing the capacity development plan to be conducted soon, travel and tours for knowledge gain should also be promoted 6. Weightage of course content, practical knowledge, OJT and practical session 7. Curriculum and textbooks based on the same should be timely revised, all the suggestions from workshop should be well and best	

					implemented	
Salyan	CDC/ Plant	1. Huge course content and not matched with labor market, the course with grade 9 should all be of basics not the detail course, giving a priority to OJT and internship rather than theoretical area, 2. Excessive course content in the additional course and there are less programs in the compulsory subjects of plant science 3. Since there are much related with plant science they all fall under plant science 4. The market for both production and the graduates is not adequate, collaboration with industry and business is not working, teachers' retainment in the program is not confirmed and internship and on the job program is not functional 5. Industrial entomology and fish culture is to be taken out and entrepreneurship to be	1. To promote agriculture business in the country, Generate employment, to easy enter to public service commission for the job, education with skill 2. So far we know the course will help us to go for higher studies and together developing the skills required 3. Fish culture and the big contents for maths and science 4. The content of computer maths and other general subjects to be taken out and instead some courses with agriculture to be added 5. Take interest in the practical knowledge and provide some scholarship to the students, Educational exploration and visits and observation is also much needed 6. Focused with internship and on the job training rather than going deeply with the theory part 7. Quality instructional team	1. This course is helpful for the students to generate employability of their own by learning skills and gaining knowledge in the subject matter and retain youths in the country itself. 2. Generation of employment quickly, one can make the better income generation and livelihood possibility by growing the crops in their own field 3. Believing all these in the above; people are attracted to the program, Nepal is agrarian country and the program is much related to our country		

		added 6. Graduates and the production from the learning are not marketable, ineffective learning because of excessive course content, teachers for technical streams are also sharing their time to general education and the learning with the practical level is going less 7. Because of the program with skill, observation, educational tour for exposure have made 9-12 much better to the one with CTEVT 8. Yes there is alignment in the course objective 9. CDC has the course related to agriculture but CTEVT has the subject area for science only, both the curriculum has covered career counselling and practical and vocational education 10. Both the course have common objective and goals they need to align each other and go conduct the program ahead	required, rear market availability even if there is production. 8. This is a very good course upon some settlement with the requirement, people can survive their lives easily even if they don't have job available in the market 9. Businesses and industries are not close as it is hard to get skill with them, tools and equipment are not adequately available for learning 10. The curriculum with CDC is fine and we don't have any experience looking at the one with CTEVT 11. Due revision is required for the course of maths and science	4. Migrating to foreign land for the employment, employment opportunity is low, however there have been many program conducted to increase the enrollment rate in the schools 5. The course is helpful for those we are much interested to go abroad for the employment 6. Better focus with practical level learning, technical studies to be made less theoretical, more practical and vocational for the employability, different campaign for increasing the enrollment, regular training for modern agriculture and		

		effectively 11. Course need to be reviewed and revised, ratio and proportion of practical and theory should be maintained, effective theoretical knowledge and the curriculum with some research knowledge would be much better, remote sensing, AI application to curriculum, attract youths to mitigate the loss of agri-business		agronomy		
Humla	CDC/Plant	1. Course is good but the order and alignment of the content is not progressive, required labor market friendly curriculum 2. The course of science is with high weightage, the content of compulsory maths to be adjusted with optional maths 3. The relationship of all the these topics are with this course and these are all related to each other 4. Teachers' retainment issue to be settled, training and the materials required for the same should be adequate, 5. Physics, chemistry and	1. The subject is related to science and technology, learn skills, independency in life and economic development, employment opportunity, business establishment 2. Excessive course content, 3. No 4.	1. 2. Income generation, employability, livelihood, economic growth 3. Self employment and help others as well to be employed 4. As the graduates are migrated to the foreign land; upcoming students are demotivated to the course, parents are also	1. the course for 9-12 are less and add some course of study for the same. 2. Graduated individual to have relevant opportunity n the business and industry, OJT to be connected with employability 3. Low employment opportunity after graduated with the course, would be great if	1. 9-12 stream is more like academic and pre-diploma and diploma are practical level learning oriented program, 2. Attraction is declining 3. long course duration, employment opportunity has been declining, poor economic condition 4. Management of teachers as human resource capital, low enrollment rate, 5. Combining both the courses and monitor well by the subject expert,

		biology to be taken out, as it hard to develop the questions from the available grid; it should be reviewed and revised, compulsory subject to be aligned as per the general stream, the students graduated for SEE can have opportunity to enroll for the plant science for 11, 12, course content in maths and social to be less in the grade of 11 and 12 of plant science, OJT only after 11&12 but some allowances for motivating students would be far better, Subjects and contents of 11 & 12 should not be taken to grade 9 & 10, the course content of grade 9 & 10 to be low and extension subject in 11&12 to be added up 6. Plant protection and vegetable protection to be revised and improved, there should be some differences between plant pathology and mushroom production, the subject matter repeatedly coming to other grades may cause		not much interested towards the agribusiness 5. This is possible when students are having better interest to the course 6. Government to be responsible for their employment and graduates should have the opportunity for further education as BSc Ag and other else as per their interests	the graduates have been provided with some seed money to mitigate their financial and economic condition 4.	6. don't know much with computing 7. Common curriculum is required. Similar activities when performed similar expectation and credit hours to be revised,

		the ineffective learning, 7. to be a self employed individual, easy access to labor market and jobs there, both the knowledge of theory and practical have helped one to entre even to the international labor market, true learning experience achieved from this, 8. the course with 9-12 should be aligned with Pre-diploma and diploma and the program with CTEVT should be merged with CDC one and handled the program under NEB. Consistency on the teachers service, collaboration with industries and aligning with employment and OJT to be reviewed and revised 10. There is no alignment to the course of both CTEVT and CDC and contents are not similar either, 11. Practical work to be focused and the students graduated with the course should be well helped for the career development in the same field				

Surkhet	CTEVT/ Animal-PD &D	1. It is much harder to comprehend students for maths, science, physics and drop out is seen even though the grade is good they achieved in the exam, curriculum is not covering latest demand of market, not being timely management of the curriculum 2. maths and physics are not easy subject for students 3. Above all are much interlinked each other, all of these have a vital role to the production in general 4. Teachers are not consistent in their service they mostly leave in the middle of the session, OJT time should be bit more, being challenging for not being agri farm in the locality 5. 6. It's hard to go the provincial office for CTEVT regularly even for mini tasks, 7. Graduates can join the labor market easily and soon, believing that it can	1. Program is nice but the employability is declining, having some family suggestion I chose this subject to pursue, because this is the education for income generation and better livelihood 2. It has a high change for employment, revision of curriculum is required timely, the course content of maths and science are to much 3. Weightage of course content has been the problem in the curriculum 4. Not gone through the curriculum 5. Teachers' retention ratio, knowledge and skills to be transfer to job, business and other profession, results almost delayed, practical session in the learning should be prioritized 6. Practical part is more important to theoretical one, OJT and Internship are not managing well, 7. It was much valuable previously but it is in declining trend, expensive program, investing in	1. The program is good even though it is more expensive and it has better employability in comparison to other areas 2. employment generating and even chances are equally high to enroll in the government permanent job 3. Program is all good but the implementation is still not well perceived 4. CDC characterizes with expensive fees, not following the annual calendar for exam, result and other activities, CTEVT characterizes as good education system available, only one school in the valley where animal science		

		help individual to be independent, diploma has been the better choice to pre-diploma, yet the attraction has been seen to 9-12 technical stream 8. All technical area should be controlled and monitored by one organization so that the effectiveness and outcome can be well achieved 9. CDC has been supported by government to run its program whereas CTEVT has been using its own, 10. Integrated and unified program need to be considered for further development of the program and curriculum, program under the same umbrella will be much effective 11. The course content for science related subjects are tremendously high and it's been difficult for one to run the program effective and impactful	education has also been the problem to the parents, very few graduates have remarkable achievement from the program 8. Don't recommend because it is expensive, employment opportunity like before is not there, result after assessment is most delayed part which needs to be considered and well managed as soon as possible 9. Irregularity in teaching faculty, materials and equipment are not adequately available, coordination and collaboration with industry is poor, study session is long and result is always delayed 10. Pre-diploma is easy and practical session has been highly covered and in diploma level the course is of long duration; the first year of 2 semester has contended theoretical portion much 11. compulsory subjects to be less prioritized whereas the technical subject should be much prioritized for the	subject is taught, 5. Curriculum is not relevant, animal science as other has been gradually improving, people are with skills, 6. Investment in education to be improved, exempted paper to be allowed timely and result also to be timely, fees and time for training should be minimized for effective implementation		

			effectiveness of it, curriculum to be revised based on the demand of labor market			
Kapilbastu	CDC/Civil	1. Course content is a bit high, to be managed looking at the time duration of academic year, contents are demanded, physics, chemistry and maths are complicated and wider however the course is good 2. It is harder and difficult for students who choose technical stream because the number of subject is 9 whereas it is 7 in general education, so it would be good to take some subject out and focus for technical subjects 3. Not mismatched 4. Teachers if recruited for permanent basis there will be low chance to miss them in the middle of the session, teachers' motivation is must no matter how much cost it requires 5. Change survey and compass survey to be declined and GIS and Code contents to be added, drawing to be digital, to	1. Thinking of getting better job after grade 12, program availability in the community level, parents interest, keen interest to be a good technician 2. Practical learning is much with CTEVT 3. We are not much aware with this 4. Contents of AutoCAD to be added in grade 11 and 12, drawing is only in grade 9 currently and it should be elaborated also in grade 11 and 12 and we actually don't know much in all these things in detail 5. Visiting in the field to be promoted, DGPS is also good to learn with, 6. It's a good opportunity to go for OJT and get a lifetime experience working with the industry and businesses 7. Technical education mainly is to get a good job in the area and engaging self with the profession of choice	1. All good with the course and if it is not then it would be good to call the expert and manage the course for better implementation and outcome 2. Easy employability, independency in life, 3. Private school are taking it negative and disseminate different messages in the community, labor market is contributed by the graduate though not a remarkable, parents are not well aware of the program 4. Students are not enrolling in a good numbers as	1. The course is good and only thing I know whether the course have been developed and timely update with better coordination in between 2. The attraction is not bad, SMC, PTA and many other parents and students had a detail discussion and took this stream in the community and program is very good and running well 3. It is hard to decide for students because of poor orientation of the program and not only to the students but	!. The program is much essential to contribute to the labor market by the skillful youths 2. Don't know much about the curriculum by CTEVT 3. Teachers are available in CDC program, laboratory are not adequately supportive for learning, practical exercise is low, Regular monitoring is not effective in the program 4. Number of subjects in the program is many, most of the students fails with science and maths, students are not well aware of the scope and the best part of the course itself 5. School in the community level have help students studying of their chosen area being with the parents, CTEVT program is relatively much

		much detail contents of soil, applied and fluid mechanics structure, airport engineering instead of transport, make a different crash course as technical or applied maths by mixing the contents of optional maths and compulsory maths, organic chemistry is less for technical stream, the current time is of AI the course even if are of basics would be okay 6. The program is god and the students with low economic background can learn and benefit better 7. CDC program is chosen by many because short duration in comparison to CTEVT one, low investment, students assessment is done 3 times a year as trimester, half yearly and yearly whereas it is semester wise in CTEVT 8. Almost 85% of the course are similar while observing the course in parallel, and both of these course are target to produce competent individual	8. it is hard to undertand evne the content in grade 9 and gradually can pick up upon our interest in the study however some are dropping out of it indicating the hard course to go 9. Materials are quite less as indicated by the course and curriculum itself, time to be used for practical is disturbing and no with consistency mode as sometime we used 3, 4 periods at a time just for practical 10. We don't know the curriculum of CTEVT 11. We don't have idea for this and so far we know it is the tasks of experts	the course is big and with much detail even in the earlier grades, scare of if not get the job and profession of the interest, only talented students can cover this course and hard for the rest 5. General course like English, Nepali, maths, social to be shortening out and focused on technical and practical portion 6. Technical stream to be free as none of the fees to be paid by the students, teachers' management, practical session to be focused by utilizing the available resources in the laboratory	parents, teachers and entire community should have introductory knowledge of this particular area in the beginning 4. Teachers are not permanent status no matter they are permanent by the government but they cannot leave the school in the middle of the session, resource materials and equipment in the laboratory should be well maintained and set for the practical for better learning achievement 5. Theoretical knowledge is required but not much disturbing the practical	expensively 6. The course should be aligned well with respect to contents and weightage of it so that common goal can be achieved to contribute to the labor market 7. Teaching and learning process, monitoring and evaluation of the program if timely performed the graduates will be competent and skillful

		9. CDC program is more scientific, relevant, new and updated where is the program with CTVET is steel structure of soil mechanics, applied and flued 10. Consistency in course content is must, 11. Courses with better implementation is required by making theoretical portion less and practical more			session where people can have the essential skills and competency required in life 6. The courses are all good and looks like the attraction is on 9-12 technical stream because it is free and it doesn't mean that the program for CTEVT is not good. The CTEVT program is more practical based as they have better session in comparison 7. Investment in education to be increased, specifically in technical stream, Course for both the program is consistent the output might also increase of similar manner and contribute	

					the labor market in a big chunk	
Dang	CTEVT / Computer-D	1. Course is good and the order and sequences of them should be properly arranged so that there would be effectiveness in the learning process and some course should be taken out of it 2. Yes, Apply mechanics in 2nd semester 3. No 4. Less enrollment of students in the program 5. Appliced mechanics to be taken out and C programming in 2nd semester, Workshop but computer workshop is required, Drawing classes to be rearranged and managed, software engineering existed in 3rd sem to be taken to 7th semester 6. Course revision in timely manner, new technology to be introduced and revised 7. If the students sees about the course duration they prepare for 9-12	1. some for their own interest, some sees the demand of the labor market, the country is lacking the skillful individuals 2. Yes they are less, 3. The computer course in 2nd semester are not related to any of the area 4. Microprocessor to be taken out and super computer to be added, applied mechanics to be deleted where as python course is to be added, all the course in 2nd semester are not relevant 5. All good but it would be good if result comes on time following the annual calendar, it should not be 3 years course or if it is so there should be regular class upto 5th semester and 6th semester should be work based learning mode 6. I think all good with this 7. Research oriented program is much required		1. Result not in time and it is easy for student to pass grade 11 but not in grade 12 because it is conducted by the board, Pre-diploma and Diploma program is much expensive, 2. Supply and demand of the resources and product is not matched, 3. No employability at all, the program is almost in the state of close and there are only 57 students in all semester now 4. All the materials required for the program is available	1. Curriculum is good and students can pass the results easily, labor market and employability in the earlier days was good but it is competitive now 2. I have got some information on the curriculum of CDC but not of CTEVT 3. Students' enrollment is less and in declining state and even though the students enroll to the program they drop in the middle, teachers are not retaining as they also drop as per their wish which has made program affected bad 4. No labor market and employability 5. 6. 7. Course content with physics, chemistry, biology and maths to be deducted as it is

		technical stream, 8. It should be aligned and should follow the one door policy 9. No 10. Arrange workshop and seminar with experts to make it better alignment 11. Timely revision and surveying of the curriculum and align with the course of study	8. Course of CTEVT is much longer as we would be in the bachelors 2nd year at the time they passed their diploma 9. All of them are provided to us by our school 10. No but duration of the course is different and value is equal of both the courses 11. CDC course are wider and CTEVT course are vertical		5. Students parents meeting to be conducted, amendments of the policy and program by the government as and when required, revising the curriculum, program should be employment oriented 6. Program by CDC is short and easy but the program by CTEVT is long and hard as well 7. Workshop, seminar to be conducted by the authorized body, The weightage of course content in terms of hours and duration to be revised and aligned	minimally required for the program of CDC, OJT and internship should be more than 3 months duration, practical session and work plan of the program need to be well designed
Bardiya	CTEVT/ Animal; plant- PD & D	1. Course content is much bigger as there are some learning area which was taken to the bachelor and masters degree program,				

		difficult to make student understood well, English medium is also tougher to the student, market demand for the specific skill is still not matched 2. Supply of the graduates with skills are not matching the demand of labor market, Students are feeling physics, chemistry and maths as the tougher course 3. All these area of study are fall under the plant science the majority of the content is under the parameter of science 4.				
Baglung	CDC/ Animal science	1. Tough course for 9-12, the resources as materials and equipment are all available for general surgery, Extension and aqua culture is outdated 2. Content is not sufficient for 9-12, VLT - totally a practical based, Microbiology if added would be great, 3. 4. 5. Vet ext. and computer to be taken out and vet	1. The area is of big scope, it covers multiple sector, easy to go abroad and easy employability locally as well 2. The course is helpful and can generate knowledge and skills, easy employment and profession 3. No, but we know that this is technical subject and can help livelihood of the people 4. Pet animal treatment to be added, OJT system to be revised, OJT together with theoretical session would be	1. Students should enter in 9th grade for technical stream whereas the program with CTEVT have to spend 3 more years after 10th grade, so 9-12 technical stream should be promoted 2. they will come up with certain level of specific	1. Course is harder and should be revised on timely manner, the stream is nice but how the graduates are living their lives matter a lot, 2. The government of a nation itself should have offer to the graduates	1. Don't know better about the curriculum but as far as I know there is problem with retainment of the teachers so that they cannot leave the school in the middle of the session, the chances of employability is 50/50 2. Both the program are much effective only upon its effective implementation 3. Scarcity of learning

		extension with revised one and sociology to be added, genetics and animal breeding to be taken out and computer and bio-stat to be added, general surgery and radiology to be taken out, general surgery to be added, outdated data for aquaculture and extension and LPM to be taken out and new data and updated version of animal science to be added 6.Curriculum to be revised, syllabus management for entrance, competitive curriculum that can connect the labor market, and linkages to bachelors degree, budget to be increased, employment possibility etc. 7. Low fund for the program, not having adequate practical learning possibility, monitoring and evaluation of the program, TOR to be given to the teachers 8. Content is excessive, 6 months and semester system whereas it is of one year period, course is less	much better 5. Would be great if we could have the knowledge of other animal locally, OJT from the beginning if allowed would be much better to learn something new. 6. No 7. The course for 9-12 technical stream is not sufficient and adequate to learn better, it's being bit harder to be selected and fall on merit in the entrance 8. the graduate if go for employment of government would also be great and expecting the same 9. Not having adequate materials and equipment while learning and gaining knowledge and skills, teachers are not of permanent status, hard to do practical, awareness program to be conducted 10. No, it would be nice if the senior batch help their junior batch in the learning process 11. Learning materials and equipment, students if not allowed to promote to	skills to live a better life generating economic growth not only of a family but a whole 3. System of entrance before enrolling the program to be in place 4. Graduates are not much competent to go for relevant job and other professions that are closed to 5. Curriculum is hard and it should be of average so that pupil can learn better easily by doing better practical session, should raise the attraction of the students from general stream to the technical one 6. Teachers should be of permanent status so that they cannot leave in	of technical stream, 3. The enrollment is not less it is average, the course of 11 & 12 if managed well, there will be high number of enrollment in grade 9 4. Challenging with the permanency of the teachers, would be great if the students of 9-12 stream have opportunity of hostel, 5. Major issues has been the permanency level of teacher in the school 6. 9-12 technical stream is better than the program of pre-diploma and diploma in CTEVT	materials and equipment, lack of expert, drop outs are increasing and it's being harder to sustain the program, 4. There are many schools drop out with the technical stream, it's not being employment oriented, migrated for foreign land, it's being harder to convince and aware people about the technical education 5. Learning and education for skill in not being understood by the people, no monitoring and evaluation by the authority, 6. Resource mobilization is still not functioning well because of various issues that raised in school itself, 7. People should be well aware of the program in the community, orientation and coordination to the program, practical session should be strengthen as it is in

		and practical is much in the curriculum 9. Connected to bachelor degree, CTEVT is generating competent work force as people can have the possibility of earning while learning 10. The graduates from both have a common purpose of the program 11. CTEVT, ministry, experts are liable to revise the rules and regulation that matches for the development of the program.	higher grade and semester until one can pass the existing level would also work batter, monitoring and evaluation procedures to be well followed, books are not available on time and they are not with good quality	the middle, practical session should be well flourished		CTEVT
Myagdi	CDC/Electrical	1. course best suits to talented students but not to average and below of it, huge contents and implication less 2. The subjects should not be that many as they can be less with important subjects, English should not be of 4 make it less as well, It is hard to capture the students who graduated from grade 10 because of their having less proficiency in English, 3. Not mismatched all aligned	1. This is much essential course, it is locally accepted course and thought would help the youths in the community 2. Seniors are so much benefitted out of this course, they are successful to be a well deserved with the required skills and course content is also well presented 3. I don't think so as all the subjects are equal value and importance 4. The topic with machine is much harder as we are not	1. It is hard to enroll the course by those who are graduated from community schools as they don't have much proficiency of English 2. Graduates would not experience not having any opportunity, the scope is quite high because the area and geography	1. Educational achievement is less in the community level schools, focuses should be given to practical education and learning, OJT should be allowed depending upon their capacity and ability, since the geography is the electricity hub the course is	

		4. Hostel should be place to avoid the inconvenience student may face, the enrollment would be high if students can enroll technical stream in grade 11, learning resources and equipment tools are expensive and not adequately available for the practical, teachers should be well trained and provide facility 5. Computer application to be taken out and put power system analysis, 6. Technical stream only after 12th grade would be much helpful and effective, English to be avoided and add optional maths instead, lab work is quite less, it is hard to get the text books of grade 11&12 found for 9th and 10th though 7. CDC focused with course content whereas CTEVT has focused for practical knowledge, education in low cost whereas CTVET has certain amount to be paid, 8. CDC is time and cost friendly, students after 11	studying its basics in the earlier grade so it should not be in the course instead it can be taken to grade 10, those who chose optional maths and social studies should remain until 5:45 pm at school so these subjects may not be useful, social studies is essential but we can avoid some other subjects instead of social itself. 5. travel and residential facility is not in the school and student should spend long time in school itself, the more on practices the better one can grab the opportunity with skills 6. OJT is wonderful but instead if the students can taken to the hydropower office for their learning, and there needs to have regular monitoring and evaluation practices in the learning processes. 7. Course is there but it is quite urgent to make it accessible to produce the graduates of skills required in the labor market 8. The course is attractive	itself has unique value of this course and there are number of hydropower company in the locality 3. Would be great if there is the facility of accommodation and transportation facility in the school, there is no coordination and collaboration in the society or it is quite less and the course has not been able to gain the opportunity 4. Huge portion of theory and low practical session has been practiced in the school. coordination and marketing is also poor to be disseminated 5. Don't know 6. Hostel and	most essential one 2. The society was seeking this subjects of electrical engineering, the students will be quite enough only when we are able to take 2 students from each community school in the locality 3. Birth rate, migration has cause the students' enrollment, students if facilitated by providing the accommodation and travel would not be declined, the social taboos for a long as the course is not of the choice of talented students, subjects to be studied are many	

		could easily start learning with the skills 9. CTEVT has practical focused training and education whereas it is less in CDC 10. It would be good to make the curriculum of CDC based on the one from CTEVT 11. It would be good if OJT part of grade 9 be of 3 months by declining from the OJT of 6 months from grade 12, education for entrepreneurship to be considered,	because the students will have the skills in their hands and hardly anything possible upon our absence 9. Teachers are leaving in the middle of the sessions they have been handling, the materials and equipment are not adequately available, teachers are not being friendly while teaching and instructing to their students, 10. Not exactly as we don't know other curriculum 11. To stop additional classes, course content to be made less and make practical session high	accommodation opportunity if provided the program might go flourishing, parents are also not much aware of this program, need to have better environment to attract people for this course even by airing advertisement around	and the time duration of school hour has also been increasing 4. Scarcity of teachers of subject specific, if available they left in the middle of the session, learning materials and equipment are much expensive, coordination and collaboration with businesses and industries is not there, 5. Course are tougher to the students who are enrolling the course, students will be high in number only when students can choose this stream from grade 11, instructors are quite fresh as there are very	

					inexperienced teachers found in this field, 6. Not much aware of this 7. Not only the students but also the parents should be much sensitize with the importance and value of the course, instructor should also have deep dedication to produce the competitive graduates, Nepal government should also take consideration while selecting them, OJT if only after they appeared in exam will be much better	
Kaski	CTEVT/ Plant	1. Content of the subjects and syllabus are not well managed, study content is quite high, practical is just to feel not to practice and perform 2. Yes, but it is not resistive	1. I have interest in Agriculture profession, don't like to abroad 2. Curriculum is fine and it helps for easy employment as well as to pursue higher studies	1. Federal, municipality and even the CTEVT has not investing the best in the program and school and it's	1. The course is more theoretical, detail and vague as the contents are many, practical exercise is less, there	1. I actually don't know about it but people can be employed because of the technical study 2. I have not gone through the curriculum of 9-12 technical stream

		and it is hard for students to comprehend the content because of the language 3. These all fall under the plant science because plant science provide everything to eat 4. OJT management, monitoring and timely evaluation, teachers are rarely interested, practical based education is still not performed, infrastructure is less, lab and library are all in place and effective 5. Genetics to be avoid and course with demand like organic agriculture ecosystem, statistics to be taken out and choose either maths or statistics, chemistry to be avoided and biochemistry to be added 6. Learning and study should be of practical based and infrastructure should be developed 7. For technical and practical knowledge, to be a self employed individual and to get a job of ones' choice 8. Technical stream as 9-12	3. No, 4. Some subject areas and contents where farmers can easily understand the content, 5. Curriculum should focus more with practical level learning rather than spending time for theoretical 6. OJT is the best way for leaning the content, OJT should be accessible in broad area of agriculture where farmers too can benefitted of it 7. Curriculum is with quality and it can generate the employability 8. The course is attractive and I can recommend it for others as well because the course can generate the employability as well as self growth, parents are also with agriculture profession, it would be helpful for them as well 9. Teachers' retention is a big problem and also it is hard for school to pay their salary on time, there is hardly any industry in the rural area of the district,	being quiter hard to run the program. And because of this the rate of enrollment is also less 2. As the students are the children of the farmers; it's being easy to get skills on it 3. It used to be high participation but it is effected by the immigration, country being a agrarian the knowledge and skills are all most useful in life 4. Rural area, low birth rate, it is hard for students from outside to pursue their education 5. Curriculum is helpful and providing practical knowledge, self employment generation is also	should be alignment between the objectives and learning of the students 2. Community itself is less interested in agriculture 3. Government is not investing adequately and the expenditure is high 4. Competent teachers are not available on time, practical session is not much effective because of low supply of materials and equipment for learning 5. Curriculum with timely revision of them, advertisement of the program in the community and prioritize for agriculture	and CTEVT 3. 4. The policy of government, attraction of students to foreign lands, hard to work for low salary 5. It's not confirm that how many people are benefited to which 6. The curriculum should be with certain objective, it should be clear as the curriculum are academic or technical 7. As I don't see the curriculum I am not sure on this

		has been really a wonderful because this all completes quite early in 4 years all together 9. There is gap in both the curriculum 10. It is essential and both the program should be one to get a better performance 11. Yes, subject content should be less, only matter that are must to be included, more modern and updated and avoid pests of plants and crops	students are not able to access it well and OJT is also not well effective 10. Pre diploma doesn't have physics, chemistry and maths but they are all present in diploma level 11. Curriculum are all good but only thing is about its implementation and its use in proper way	one character of it 6. The government should also help with financing and investing, mapping of program is also much required	6. I don't have much information on grade 9-12 technical stream 7.	
Kathmandu	CDC/ Electrical	1. The course is fine but the timely revision and amendments together with some monitoring and evaluation purpose is mostly needed 2. The course is directly influencing but it would be much better if we enforce for its better implementation by adding more practical opportunity 3. All the courses in this subject are in order and aligned 4. Not much but OJT if started from grade 9 would be much better because it would help making the	1. Practical based education for skills, came to know that seniors are enrolling this course for better opportunities, it is increasing the GPA of students for 50 marks for practical, physics, chemistry, maths are hard subject, can work for doing business of electricity and do the job in the field of hydropower business 2. Computer and drawing to be added in grade 10, course should be different as the grade is up gradually, 3. Industrials installation and maintenance should be	1. CTEVT is charging sum of money whereas it is almost free in 9-12 technical stream, it is highly competitive and people are using power for the admission and enrollment, major achievement of the course is to produce competitive graduate individuals, permanent teachers are not	1. 40% theory and 60% practical session was there initially it is 50-50 now however practical knowledge from the education is still taught and not much effective 2. It used to be a job oriented program initially as there were more than 52 students in a batch but now they have come	1. It is so hard to realize if the program is running well and proper 2. There should be quote system with some competition for the enrollment of the students in the school 3. Challenges is only about the better implementation with constant students enrollment and graduation 4. Overall management system of the school is accountable to low admission rate prevailing in the school

		basement on the practical ideas while learning. As we do have our own small enterprises in the premises of the school itself so that the students have different experience of the business and the practical based learning 5. The computer studies to be taken out and focus for installation and break it down to 3 different areas, frequent workshop to have better learning opportunity to the students, applied maths to be established by cutting the course of optional maths 6. Per child fund (PCF) should be well maintained and followed properly and together the amount for lab maintenance, ICT based classes to be run 7. We rarely see the curriculum of CTEVT however we have understood it to the required level. The course people believe are for skill development in ones 8. Concept of technical university would be far	taken out as it is not relevant to the regular courses coming up 4. We don't have much concept with this 5. Practical learning opportunity is less in grade 9 6. Teachers are changing in very short duration of time as sometime they are out just by taking 2,3 period in the class 7. There is not seat and quote in general stream of education and we have chosen technical stream, there is some problem with basic electric course previously and now it is getting improved 8. Practical session in the learning process is quite less 9. OJT and internship opportunity is good but monitoring and evaluation for better implementation is not well functional 10. We have not got any opportunity to see the course of CTEVT yet however we have some level of understanding that they have better practical	available much 2. Understanding technical stream has effective learning opportunity, students are much confident to enroll for the course even if it is quite hard 3. Students are starting learning foreign language to board in the foreign land 4. It is so hard to know if the course goes for phase out soon 5. we don't know about the course in the comparison mode 6. consistency and regularity in education system, students are starting commenting on their problem in the learning system, teachers retainment in the	down to 27 by gradually declining in the enrollment, the parents were much enthusiastic to know about the study in technical stream but the craze to this subject is also gradually declining 3. Actually don't know the difference, after 9-10 study students are switching to general stream as well, teachers are not permanent in their job, trend has gone quite a negative way as 9-10 graduate choose the science stream in 11 & 12 of general stream 4. We do have different lab	5. Most of our students are in the job and enterprise development, and some are enrolling for bachelor in higher education in the general stream 6. The program with CTEVT is good 7. It would be far better if province level CTEVT can handle the entire technical stream for the education and learning mechanism

		better as the responsibility they may come to assigned directly to the board so that one door policy of the organization would be much better so far 9. It would be good to align with the course curricula of CTEVT to have better practical experience 10. Yes, and calling technical experts for this particular subjects and arrange a workshop and program that can contributed developing curriculum 11. Since this is technical subject it should not be taken as the subjects in general education system for a long	experience in the process of learning and gaining knowledge in the subject matter 11. Practical session to be well equipped and functional for the learning process of the students	schools and regular parents meeting has made this program somehow better to time then	opportunity for the students of grade 9-12 even for maths as well 5. Teachers availability is quite poor as learning opportunity is quite less to the students 6. The scenario is declining mainly because of teachers unavailability 7. As I heard of CTEVT they have good teachers flow and human resource transaction system where as it is quite poor in our course and school. The provision is for 50-50 but practical session has not achieved for 50 yet	
Bhaktapur	CDC/Computer	1. Lengthy course title, admission of low grade students, the course	1. Of their own as some students have heard the story of Elon Musk as an	1. Yes we know it as CTEVT has been running the	1. This course has come mainly because the	1. This is nice program but implementation part is still not flourishing

		previously of 40-60 was effective but it is 50-50 2. Curriculum needs to be vertical so that students will have effective learning, issues with health hazard and safety while learning from practical and work based learning, combining optional maths and compulsory maths to applied maths 3. No mismatch of the course 4. Industry tracing is required, OJT and internship program are conducted in personal contact, there has been some moment of materials and equipment scare 5. Contents with safety and health hazards should be added 6. Gap for OJT and intern in grade 9 to be avoided as they too need the opportunity of OJT 7. Firstly the interest of the students themselves, students from general doesn't have chances and choose technical stream, less advertisement of the	individual raised from the technical world, brother and sisters in the family were studying the same subject, Some have keen interests in handling the screw driver and other tools, learned as OJT and Internship will have the better learning opportunity at the time of covid-19 2. Even the course in the CDC is not aligning as the course for grade 9 is not matching grade 10, teachers are not able to control the class and learning is not effective in the class, and some are suffering a lot because of bullying even causing up to the suicidal case in return 3. Social studies should not be only at grade 12 but it should come from the basement 4. Course load is excessive and it should be well matched 5. Don't know 6. All good with the work based learning 7. We are confident as the course is all right but the	technical course for a long time 2. Parents are also completed the basic computer course in their time 3. Very nice program and students after graduation can get a job of their desire and expectation 4. Students are not declining in this school as there will be call from even minister to admit their close students 5. CTEVT is also good but we in the program are not paying fees for the course and it is also very good program 6. Not much but we too had suggested school to run the program of CTEVT	program for CTEVT has already existed, the syllabus for 11 & 12 is having effective learning system as practical is less than CTEVT, vertical approach in learning scheme is required and the subject like physics, chemistry and maths are thought to grab and student are dropping 2. Students are dropping even the there is enrollment of middle grade achiever to high so they are dropping in upper grade as well 3. Awareness program in the community about the	well 2. As I don't the course in detail but both the program are good but technical stream of 9-12 is not implementing well as it is from CTEVT 3. Program and the graduates from it are having challenges in enterprise development and employment opportunity 4. Lack of interest to enroll in the program, labor market is not providing the opportunity, much feasible as well but students are not enrolling 5. Federal government is offering much accountable to the local government 6. These course should be aligned which help vertical learning approach and the achievement 7. TECS modality is also good where the students can have the learning opportunity

		course, the business or the program of CTEVT is getting less. 8. Alignment needs to be addressed as the learning of both the stream needs to have better learning achievement 9. Not exactly there is overlaps and inconsistencies in the course but the practical level of learning in CTEVT is quite high 10. Strengthening the practical knowledge by allowing students for OJT and Internship in the course of CDC is required to be increased 11. Curriculum should be of vertical approach so that the students will be better learning	implementation should be as it needs to be 8. Yes we will recommend the course for our upcoming students 9. Teachers leaving in the middle of the course session is negatively affected the students learning 10. We don't have experience looking in detail about the course of CTEVT but we have heard the practical level learning is better in CTEVT 11. Practical experience for us needs to be increased		program is much essential 4. Coordination and collaboration with industry and school is much essential which has not been functioning well yet 5. vertical approaches in learning should be introduced and applied and go for detail study 6. Don't know much in detail but so far I know Java program should be introduced effectively 7. I think the teachers and students are much liable to this question	even though there is less number of students
Dolakha	CTEVT / Plant Science-D	1. The course for economics is much similar with BSc AG, Quantum theory of hydrogen atom is in the course for physics which is			1. I might not be the right person to answer this question as the teacher	1. The program is really nice but it is hard to say why this is not effective 2. Don't know much about it but the course

		much harder, course for semester has been made year wise 2. Not really, course should be based on the general knowledge but they are harder and it is not friendly with the labor market as well, the syllabus should be made by us in reality instead of allowing other people in the center. 3. The common environment of the course is based on the plant kingdom 4. The duration of OJT should be increased from 3 months to more and engage more students and focus for the same. 5. The subject maths to be declined to one as there are 2 mathematics, make the course of English one instead of 2, Transfer computer and statistics to semester II, Focus on MCQ in exam, making economics quite simplified and add social science 6. Monitoring and evaluation of the program is down, update with			themselves are explained better to this question 2. Students are not enrolling much as the number of students every year has been in declining mainly because of the family migration 3. It's been 2 years students' enrollment is declining, graduates are choosing foreign employment and even though there are hardly any chance of being employed or start their own enterprise, semester system is vague and students were not interested to go with the course, 4. We have taken our student for OJT in different	with CTEVT is with much practical issue, 3. Common issue is about aligning the course as any area that one is failing to cover should be captured well in both the course 4. Declining population, migration, flying for foreign land and capital city of the country 5. It used to be easy for people to get employed btu it is hard now. 6. Investment for the course if big yet the enrollment is still not in the trend and teachers are also not adequately available 7. Allowance should be provided to the experts and even the teachers who are teaching in the program

		teacher recruitment and engagement 7. JTA used to earn 40K-50K during earthquake time and covid-19 but now there is hardly areas found to engage them in the community and even in the country itself. we are the immediate one taking affiliation right after Jiri Technical Institute 8. Curriculum should be made and amend only after reviewing the course development in general. 9. CTEVT has the vocational approaches in learning whereas 9-12 technical stream is academic, course should not be repeated in the same, learning should be of training based like in CTEVT. 10. Yes it is required to make good alignment in the course so that the goal achievement come aligning 11. Curriculum should be made by the real time expert as all the expert faculty should be assigned to put their individual views			venue and business, industry etc and the availability of teachers are rear even though there is vacant position 5. There are only 9 students go for SEE appearance and it has been the challenging situation to increase the enrollment 6. I don't have gone through the curriculum in detail but my perception to this is not develop the real time course so that people can easily learn the content 7. As I said in the immediately previous question, experts from both the curriculum should be called	

					for the workshop to improve the course.	
Chitwan	CTEVT / Civil-D	1. Courses are all good based on the levels 2. No, All the subjects are contributing directly to the beneficiaries 3. Not mismatched 4. Internship, OJT and other monitoring practices have been implementing 5. As per required syllabus and knowledge everything is up to mark 7. The graduates of this course will get job easily both in governmental position as well as the position in the private sector 8. Don't have any teaching experience with 9-12 technical stream but in diploma level all the technical knowledge required are aligned as required for	1. All the subjects are well matched 2. No, all the subjects and the contents are contributing to the course 3. Not mismatched 4. Availability of required materials, monitoring and evaluation of internship, course has inclusive of lifelong learning skill 5. n/a 6. Timing of examination and result, monthly evaluation from CTEVT and college, curriculum update for every 5 years 7. 9-12 program is not so effective, diploma should be upgraded, skill assessment in addition to the course activities 8. 9. 10. Technical stream for 9-12 should be stopped because manpower is shortage that leads to poor production of students 11. Breadth and depth area okay, implementation on		1. Credit hour is much in comparison to the 9-12 technical stream, and it is much relevant though 2. Civil engineering is much chosen not only by the local people in the country but a global choice of the students 3. Education policy is responsible to the lower enrollment of the students, technical education has been suffering as the youths in the country have been boarding everyday, it can be improved if the policy is amended by	

			academic and practical basis is required		motivating or enforcing them to enroll for the technical stream before they pursue their career in the international market. 4. TECS modality program to be well equipped for the achievement of expected outcome 5. Not being able to enforce them to make this course of their choice 6. CTEVT course is quite high and with much weightage than it is in 9-12 technical stream 7. CDC and Nepal government should coordinate and collaborate with CTEVT for its development, parents and	

					others in the community has been facing confusion of this two similar courses	
Bara	CDC/ Computer	1. Courses in the curriculum are tough because the contents are of bachelors level, data communication if was of previous level would be so nice, teaching multifaceted knowledge is rather good to implement the program properly, the course previously was hierarchical but it is mixed now 2. Curriculum based textbooks are not available first of all, students are all dependent on teachers as they are not free to learn different things differently, some contents are equivalent to the course of bachelors and masters, teachers are setting their exam question as per their level of teacher or the course that were covered in the classroom and practical field, 3. Availability of the	1. we studied it because of our own interest by seeing the values and importance and output of the education 2. we are dedicated to do something new in life by studying the course, education with practical knowledge is much helpful and influential, we are regular in class and it is all about learning and gaining knowledge 3. Course is tough, it is because of not having interest on the subject s/he is studying 4. Course is nice, we can go for engineering after graduation and even to the regular bachelor degree, we are happy, instructor has taught us about website development 5. We use AI in daily basis, we search the content where we are much interested,	1. course is nice and my children are happy, I have been talking to HT and understand the issues they may raise about the course and development of education, students are many in this school, building is well enough for the required infrastructure management, I am sure the this school is more strict to other boarding school around 2. My child choose this subject of own all depend on the student, I am also technician for repairing and	1. Course content are not that matched, course is as per the level but it would be good to confirm with the class wise reference in the curriculum 2. The program is attractive, relevant, of choice and market oriented 3. Competent teachers are not available, ICT equipment like smart board and others are not available, lack of electricity supply, road and transportation are also weak and skills are not linked with labor	1. The demand of this subject is much in labor market, it will help on management of employment 2. CDC is focusing for knowledge, practical on education and skill where as CTEVT has 18 months program, 6 months and 3 months program 3. management of human resource is poor in CDC and curricula of CTEVT are not updated on timely manner, program are not much effective to confirm the employability, poor coordination and collaboration, graduates are not engaging in work as being unemployed 4. Not being well aware of the program, comparatively expensive

		materials and equipment that are required in the learning session, teachers should also be facilitated by a computer though not a laptop to be provided, practical time is quite less because booting and preparation has been taking around 10 minute already, salary for a teachers is low, 4. No training available for teachers, one training for OJT orientation was there previously 5. Course are all good but not specific in terms of its weightage and it should be well managed, We talk formally of everything but not implemented well, 6. Loksewa mention us while calling application for vacancy but they leave us unknowingly that means very few people from this area are joining the job 7. Suggestions for improvements: deprived and disadvantaged people should be uplifted by making them well trained, the graduates are to be promoted to the high level	6. Computer networking is satisfactory but the area of data communication is less now which was wonderful topic to go with the learn 7. Math is easy, since this is computer area maths is required but not much 8. The notes provided by teachers are not much enough to pursue the education and training, as it would be really nice if the government itself has some additional supplements to it 9. Internship is only after the graduation of 10th grade, It would be good to earn something while learning, some support for entrepreneurship, 10. The program is not well marketed and people are not well aware of it and students are not much as well, 11. Syllabus should be specific and should not be vague because it has not been revised properly on time,	maintenance of watch and other equipment	market 4. instructors are not available, lack of library, OJT and internship are not much functional 5. Training to the trainers are much needed, questions collection workshop and its management is required because of which it will help run program easily and monitored well 6. No 7. I have gone through	program, curriculum to be revised on time 5. The program with CTEVT is much effective because it relatively focus high for the practical exercise on learning, 6. Yes it is because the graduates from CTEVT has not allowed to be a instructor 7. Conduct a survey of labor market and run the program that requires most, curriculum to be revised in timely manner, add resources for the better implementation of the program

		programmer or just doing small business or help in the business and industries				
Sarlahi	CDC/ Plant Science	1. Nature of subjects and content: I am veterinary doctor and it's been more than a decade long experience gained in teaching, 2. Effectiveness of the curriculum: Curriculum is nice, initially they were 11 and weightage is big, the course is salable as well 3. Contribution: The students are enrolling mainly of their own interest, also because their parents are also handling agriculture profession for a long, 4. Plant science and animal science: plant science is having direct relationship with agriculture and it would be nice if we were able to include it with animal science as well though for the introductory content 5. Challenges: Training is quite low as if we are not getting a single training session, it's hard for us to	1. Nice course to go with and in case of practical exercise we do some practice in our home ourselves to have better expertise in it 2. Reasons behind choosing the course: Of my own interest, I came to know much about the program and joined, 3. Curriculum satisfaction: It is good program with its curriculum, it's timely, more practical in the learning system, well planned projects have been conducting during the course period 4. Capacity of curriculum: we are capable enough to capture the knowledge and skills from the learning, course content is not overloaded too 5. Scope of course content: No sir, but it has been practicing, 6. Content to be avoided and added: it's been hard for us to go with 2 subjects	1. Independent: People stand their own if they choose technical education, 2. Objective: is to enroll our children to technical education 3. Faith and belief in plant science: It helps not only in personal level but in a holistic by retaining the youth force in the country and offer the job in the country itself 4. Employability: Farmers are fighting with middleman of their business, still having problem in the labor market as well as product market, 5. Reasons behind declining enrollment:	1. Course is more focused with theoretical aspects, complex, students of low academic profile, not timely revised curriculum 2. Community is not helpful, useful program with respect to labor market status, not the subject of students' choice 3. lack of awareness, problem of unemployability, less attraction toward to foreign employment, narrow perception on believing it only for crop production 4. low	1. Skills have been thought from the level of school itself in the curriculum, competent human resource is the major objective of it 2. Both the curriculum are fine and they are having direct alignment for the employment of national as well as of international labor market with required competencies and skills 3. CDC has competent teachers are hardly available, lack of infrastructure, not revised curriculum, lack of finance and investment resources and CTEVT has been having lack of quality training, challenges with financing and investing, monitoring and evaluation is not proper etc. 4. Being out of parents interest upon their children not having

		make them stay in school until the end, they should be given opportunity for practical session 6. Collaboration: We do have oil production training center and agriculture and we allow them to go there 7. Subject to be avoided: Agriculture has huge content to go with if we compare it with other subjects as well, it would be really nice if we can include some portion of animal science 8. Suggestion for improvement: first of all the course need to be amended and revised and the experts should be aligned for the research and development tasks, its been harder for us when the course is one and questions in the exam comes of another way, it's been for a long not of one and two times 9. Attraction: OJT has helped students learn the skills a lot and confident to grab the job of their interest, 10. Relation between CDC	for mathematics and also hard for us to focus on agriculture, optional to be avoided and put computer and ICT based course 7. It would be easier for us and the students to pursue the education of the choice if schools are available in the nearby as one district one school. And we need not go far in other districts 8. Internship: We can easily practice on the skills and competency what we learn in school 9. Entrepreneurship: Agriculture is the backbone that can generate the employment in the community as there many areas not sewing anything with them. 10. We don't go to foreign land and if we go we will get back with some skills to start again in our country 11. Attraction of the program: Basically people are highly attracted toward the subjects like computing and accounting but still people don't have the minimum level of attraction	People are because of political instability and migrated toward foreign lands from the country 6. Service: we are not well aware of the service school is providing to the students and we are expecting to be informed in the days to come 7. We were not much informed however whenever school inform us about the program we will be having full of knowledge and information	enrollment, collaboration with industries and business, OJT is lee in practice, human resource management 5. Investment in agriculture, employment management, curriculum revision on timely manner 6. CDC curriculum is complete and CTEVT is simple and effective 7. CDC curriculum should be convenient and easy as of CTEVT	been engaged with any job and profession even after the graduation, no practical exercise but of a name alone, lack of competent teachers 5. The knowledge, skills gained from long term course is much effective to the course of CTEVT for short term skill training and diploma and pre-diploma has also very much effective program 6. Even though the courses are two, curriculum should be made much aligned, curriculum for practical based as matched with industrial expectation is must, 7. Implementation level needs to be focused with, improved monitoring and evaluation, coordination and collaboration with industry is must and the student where they learn skills should be duly awarded

		and CTEVT: CTEVT is much easier because semester is of 6 months and 4 months of engagement is enough for learning process, whereas we are hardly spend 150 days for learning here, type of 3 years is good 11: Recommendation: Course should be standardize, ICT should be aligned in the course for its efficiency, We do have many course to be standardize for better learning	with it 12. Suggestion and recommendation: Agriculture can be a profession for a long if we do it seriously and in modern ways like emerging and scientific process of doing agriculture 13. Challenges and use: We can do it but government should support it without failure, it is still harder for us to get the manure on time, quality and quantity, farmers should have suggestions by the experts in agriculture 14. Curriculum alignment: OJT and internship are much needed for a better learning, we are poor in practical aspect 15. Problem and suggestion: Field is a bit far from the school, materials and equipment for practical is also not adequate, you too might have known even the model schools doesn't have resources for learning			
Mahottari	CTEVT / Animal Science	1. Nature of subjects and content: I am veterinary doctor and it's been more	1. choosing this subject: We choose this subject of our own, we can make a good	1. My daughter is studying animal science and she is	1. Curriculum needs to be updated and	

		than a decade long experience gained in teaching, 2. Effectiveness of the curriculum: Curriculum is nice, initially they were 11 and weightage is big, the course is salable as well. 3. What difference you have felt then and now while doing teaching in the school: Whatever we studies all were with in-depth knowledge, but the students are not having opportunity to learn these things in detail as the subjects are quite superficial in terms of learning achievement. the course for 9-12 technical stream is much better even if we compare it with similar others, 4. Learning, experience and market: Learning is with 100% skill oriented, one man job as no need fall under anyone's force, job is in the projects and the governments, I am sure there are hardly anyone who are not having job and profession, students can	treatment to the animal like pets and others in the family and community, 2. Weightage of course content: not exactly the big it is normal and easier for students to gain knowledge 3. Content out of course: Teachers are supporting by accessing the YouTube and other social sites and resources 4. Opt. maths/social science: social science is good because of being job oriented, people are much interested to be a leader rather than doctor and engineer 6. Course satisfaction and use: we can practice in our own home, family, neighborhoods and society in the community 6. How to convince students to enroll the program: people are going to provide job facility going their home and invite, having skills in hand everything can be done well of their own, prime minister has provided the silver lining and the possibility of getting a good	happy, she is feeling much responsible to us and our family, I am sure this helps her generating required skills	amended, some courses have much course content and some have less so it should be matched well for much effectiveness, teaching and learning procedure when goes ineffective students will harm of it, entrepreneurship and enterprises concept is also developed in the course and curriculum 2. courses are having good attachment of skill to be sold in the labor market and people are interested to pursue this course 3. Lack of right information, people are perceiving this	

		establish their own business by investing a minor investment 5. Relationship between animal science and plant science: There are hardly similarity as they are different subjects to learn, some areas are much interlined as one cannot be accomplished until another area is not touched up, 6. Teachers' facility and learning materials: There is not permanent status of teachers, our lab is the highest spacious even in Madhesh province, it is almost good but we are seeking better remuneration and service for us, public service commission should also recognize technical and vocational education and study so that people can have better understanding on it 7. Recruiting teachers and cutting off of them: student study maths in 9 and 10 but it is not found in grade 11 itself, it would be good and think so that if there were	job; 7. OJT and Internship: OJT is also available in the school itself and some aer going out for the same learning procedure, We could learn a practical knowledge while engaging in OJT and it is really nice environment the teachers have been providing to learn things quick and easy 8. Challenges / problem: Animals are dying of not having proper treatment in the community and hope it is much required subject 9. People are saying that there are tremendous opportunity to go with diagnosis and treatment procedure 10. Attraction: We are so excited to know that the course is much attractiveness of the course, Lifetime learning and practical approach: We can go to lab and learning many related things, we didn't go to field in grade 9 and at the end of grade 10 we started go to field for practical knowledge,		course as of second grade, poor infrastructure, Fees is less in comparison to other similar course 4. teachers' management and quality, lack of practical materials, coordination and collaboration with industries, challenges with practical education, practices with monitoring and evaluation, challenges of economic and infrastructure 5. Teachers availability, updated curriculum, students' evaluation system, 6. Generates employability	

		not general science subjects students will be much focused with the core subject, AI related subjects if added would be great 8. Revision and amendment of the curriculum: The students of technical stream have additional 2 subject who need to sit around 2 hours more everyday if we compare it with general education, So the students may be demotivated for staying longer, instead we can avoid some general subjects of general education and add some core technical subjects so that they can learn better applying all the resources for practicality 9. The program with CTEVT and CDC: the program with CDC is much effective than CTEVT because time is short where as CTEVT is taking not less than 5 years if we see it from grade 9. I have been teaching in the private sector as well but it is not that effective as it is here 10: Relationship between	11. CTEVT vs recent course: it would be very nice if other people can also get this opportunity, education depends on one's ability to grab the content and resource, it is also very good achievement in this profession because animal cannot express their response and make us immediately understood		and focused with capacity development 7. Both the contents of the curriculum should have common standard to implement the effective program, coordination with industries and business with much relevancy, ensure the quality of the program	

		the program: the program with CDC provide 12 years of education where as CTEVT taking not less than 13 years, the course with CTEVT is a bit in-depth and width 11. Coordination between curriculum: There is high and close relationship between the curriculum both CDC and CTEVT program, 12. Resource materials and suggestions for the improvements: parents should know first about the program so that their children while studying at grade 8 might have got interested to join the technical stream of grade 9-12				
Morang	CTEVT / Civil-D	1. Program is effective however some semester have big contents as if students have hard time to cover them properly and effectively, course to be revised on time 2. No such subjects available, timely assessment and result to we well maintained with	1. The program is producing skillful and competent manpower to contribute to the labor market, people have seen the opportunity to this course by looking at the demand side of labor market in the country and else out 2. Bit aware of the program, it helps for the required	1. The course is free and we feel we are benefitted 2. Self and easy employability 3. Attraction has been less now because the trend has been prevailing with abroad migration	1. Courses are market oriented and it would be good if we could make this much effective as time passed by 2. Attraction to he subject is declining, monitoring and	1. In terms of employability the course is effective and expect the school is contributing ahead with the program 2. Don’t know exactly 3. CDC program to be revised with its curriculum in timely manner, teachers'

		the calendar 3. Not mismatched 4. Because of high theoretical portion practical has been less and not performed well, making internship and OJT much effective for learning environment, timely exam and result 5. Contouring survey and chain survey to be taken out and avoided; and GIS and total station together with new software like CAD, SKETCHUP, KEVIT and similar other should be introduced 6. Practical session and the area to be developed which is possible with some level of theoretical knowledge to be developed 7. Reform in the practical session is highly required because people can get a good job in short period of time, skill and competency comes together with required knowledge 8. We don't know about technical stream for 9-12 9. I have not observed the curriculum of CDC	employment for the graduates, it further helps for higher education as well 3. Courses are all good and core course has effective role to be accomplished by the teaching and learning process 4. don't know 5. The course content of construction to be revised well and the content with theory should be less and practical more 6. Theoretical and practical session to the level are all helpful for the OJT and other field work, 7. The authority should have regular monitoring and evaluation for the effective program to better supplement of the graduates in the labor market 8. Yes we suggest upcoming students for the program but not in this school because the management is not good. Other school might have better management and effective program being conducted 9. Consistency and	4. Because not being able to aware people in the community the student are enrolling less now 5. The curriculum has not been implementing well if it was effective and productive, general subjects to be revised and make it crash and core technical subjects to be added and revised better 6. Course if collaborated with the international market might work well, both central and local level government should consider for financing and investment	evaluation of the program in timely manner is much essential 3. The government doesn't seem responsible to manage the labor market existing as people are migrating foreign countries in a high numbers every day 4. Teachers are not available, laboratory and lab is not effective, exam and results are not in timely manner 5. Curriculum to be revised timely and monitoring and evaluation should be well maintained and functional to effective program conduction 6. Existing	training for the program implementation is also required and for CTEVT, all the same but coordination with CEHRD is must 4. The program is not everywhere with easy access, much expensive, subjects of not their choice 5. Teachers' availability is poor 6. Coordination between CEHRD and CTEVT is much to make technical and vocational education effective and productive 7. All three entities as CTEVT, CEHRD and CDC must have coordination and collaboration in between to make the course more fruitful

		10. Don't know 11. Internship and OJT to be managed, new curriculum to be developed, exam and result should follow the calendar of the program	regularity by the teachers are not there, materials and equipment to be well managed, monitoring and evaluation of the program to be regularized 10. Not observed the one 11. Curriculum to be revised on time and implement		available knowledge has been transformed to the skill and competency in technical education, it generates the immediate employability 7. It would be good to make both the program curriculum more similar to get an expected outcome	
Tehrathum	CTEVT / Animal-D	1. The CTEVT curriculum's effectiveness is moderate but faces challenges due to outdated content and insufficient alignment with market needs. Some subjects are overly complex, while others lack depth, impacting comprehension and relevance. Greater industry collaboration and periodic updates could enhance its market suitability and overall impact	1. म अहिले CTEVT अन्तर्गतको डिप्लोमा तहको पशु विज्ञान संकायमा अध्ययन गरिरहेको छु। पशु विज्ञान एक प्राविधिक कार्यक्रम हो, जसले कृषिसँग सम्बन्धित जनावरहरूको वैज्ञानिक तथा व्यावसायिक हेरचाह, उत्पादन र व्यवस्थापनमा ध्यान दिन्छ। यो विषय मुख्य रूपमा घरेलु तथा फार्ममा पालिने जनावरहरू जस्तै गाई, भैँसी, कुखुरा आदि सम्बन्धी ज्ञान प्रदान गर्छ। मैले यो विषय रोज्नुको कारण नेपालमा अधिकांश मानिसहरू कृषि तथा पशुपालनमा आधारित भएर जीवनयापन गरिरहेका छन्, जसलाई सुधार गर्न म सघाउन चाहन्छु। साथै, यस क्षेत्रमा मेरो विशेष रुचि छ र	1. विद्यालयले सञ्चालन गरेको प्राविधिक धार (९-१२) ले विद्यार्थीहरुमा बलियो आधार निर्माणमा सहयोग पुर्याउन सक्छ । त्यसै गरी साधारण विद्यालयहरुमा पनी ऐच्छिक विषय राखेर पठनपाठन सञ्चालन भएमा विद्यार्थीको आधार निर्माणमा सहयोग हुनेथियो । तेह्रथुम जिल्ला आठराई गाउँपालिका, वडा नं. ४ मा सञ्चालन अवस्थित तेह्रथूम बहुप्राविधिक शिक्षालयमा ३ बर्षे डिप्लोमा तहमा पशु विज्ञान बिषयको पठनपाठन	1. नेपालमा प्राविधिक शिक्षा र तालिम प्रदायक संस्थाको रुपमा विद्यालय तहको प्राविधिक धार (कक्षा ९-१२) र CTEVT अन्तर्गतको प्रि-डिप्लोमा तथा डिप्लोमा तहको अध्ययन अध्यापनलाई लिइन्छ। CTEVT अन्तर्गतको Diploma in Agriculture (Animal Science) अन्तर्गतको कार्यक्रम यस शिक्षलयमा सञ्चालन भएरहेका छन। उक्त पाठ्यक्रम मेरो अनुभव र अवलोकन अनुसार	1. प्राविधिक धार (कक्षा ९-१२) को पाठ्यक्रम र सिकाई CTEVT को तुलनामा विद्यार्थी माझ प्रभावकारी नै रहेको पाइएको छ । समयको खर्च र जनशक्तीको दृष्टिकोणले पनि ठिकै रहेको छ 2. • प्रवेश परीक्षा एउटै निकाएले लिएर मेरिटका आधारमा भर्ना नभएको, प्रणालीमा फरक रहेको 3. • जनशक्ती व्यवस्थापनमा जटिलता; • विद्यर्थी को आकर्षण नभएको, • ३ बर्षे डिप्लोमा समयको हिसावले लामो रहेको 4. • विद्यार्थीको विदेशिने मोह, • प्राविधिक जनशक्तीको भने अनुसारको रोजगार वजार नहुनु, • प्राविधिक

		2. Some CTEVT curriculum subjects, like overly theoretical topics especially chemistry, physics and biology contribute minimally to practical skills and may hinder student progress. Redundant or outdated content can confuse learners and reduce program relevance. Streamlining the curriculum to focus on market-driven skills would enhance learning outcomes 3. Subjects like beekeeping, sericulture, aquaculture, lac culture, and animal husbandry fall under crop science due to their integration in agricultural systems, supporting crop production (e.g., pollination, nutrient cycling). They also appear in animal science because they involve animal rearing and management, creating overlap. Clearer delineation and interdisciplinary approaches could reduce redundancy in both fields 4. Implementation challenges include	यसले व्यवहारिक सिप, दक्षता तथा रोजगारीको राम्रो अवसर दिन्छ भन्ने विश्वास राखेको छु। यो कार्यक्रमले मलाई आत्मनिर्भर बनाउने मात्र होइन, देशको कृषि तथा पशुपालन विकासमा पनि योगदान पुर्याउने अवसर दिन्छ भन्ने अपेक्षा छ। यिनै कारणहरूले गर्दा मैले पशु विज्ञान विषय रोजेको हुँ 2. मैले अध्ययन गर्ने कार्यक्रमको पाठ्यक्रमले पशु स्वास्थ्य, पोषण, प्रजनन, व्यवस्थापन र उत्पादन प्रणालीजस्ता महत्वपूर्ण पक्षहरू समेटेकाले म ती विषयवस्तुहरूसँग राम्रोसँग परिचित छु। यस कार्यक्रमले प्राविधिक र व्यावहारिक सीप प्रदान गर्ने भएकाले पशु विज्ञानको क्षेत्रको समग्र सुधारमा सहयोग पुग्नेछ। पाठ्यक्रमले वैज्ञानिक पद्धतिमा आधारित अध्ययनलाई प्राथमिकता दिएको छ, जसले कृषि तथा पशुपालन क्षेत्रको विकासमा नयाँ खोज र अनुसन्धानलाई प्रोत्साहन गर्छ। यो कार्यक्रमले केवल कक्षा कोठामा मात्र सीमित नरही प्रयोगशाला र फिल्डमा समेत सिकाइको अवसर दिने भएकाले विद्यार्थीलाई रोजगार बजारका लागि सक्षम बनाउनेमा म विश्वस्त छु। साथै, यसमा समावेश गरिएका सबै विषयवस्तुहरू सन्तुलित रूपमा प्रस्तुत गरिएकाले यो पाठ्यक्रम एक सक्षम र दक्ष ग्राजुएट उत्पादन गर्न पर्याप्त छ भन्ने मलाई लाग्छ 3.	भइरहेको छ जसवाट 2. यस कार्यक्रमले कितावी ज्ञान मात्र प्रदान नगरेर विभिन्न प्राविधिक र व्यवहारिक सिप सिकाइ विद्यार्थीहरुलाई स्वरोजगार र स्वालम्बी बन्न सहयोग गर्दछ साथै घर परिवारको आम्दानीमा सहयोग गरी कृषकलाई प्रविधिक सेवाको पहुच सहज हुन्छ र विद्यार्थी आफै उद्यमी बन्न सक्छन् 3. कार्यक्रम त धेरै राम्रो छ । तर पढेर के गर्नु र ? आखिरि वैदेशिक रोजगारीमा सहभागी हुनैपर्छ भन्ने मानसिकता व्यापत भएकोले त्यती रोजाइमा नपर्ने अन्यथा वजार सान्दर्भिकताको दृष्टिकोणले यो कार्यक्रम अत्यान्तै आकर्षणको केन्द्रमा रहेको छ किनकी यो कार्यक्रमको सम्पन्न पश्चताप रोजगारीको अवसर प्रवल बन्न सक्छ । प्राविधीक शिक्षा भएता पनी व्यवहारिक ज्ञानमा भन्दा सैद्धान्तिक ज्ञानमा जोड दिएकोले यो कार्यक्रमको आकर्षण घटेको हो कि जस्तो लागेको छ 4. 5. विद्यार्थीहरुको लक्ष्य प्राप्तिका लागि यो कार्यक्रम र पाठ्यक्रम सहयोगी वनेको पाएको छु । सामान्यतया हाम्रा वालीनालीमा लाग्ने रोग किरा,	आंशिक रूपमा प्रभावकारी देखिन्छ। पहिलो वर्षको पाठ्यक्रम शुद्ध विज्ञान (Pure Science) मा आधारित भएकाले विद्यार्थीहरूलाई बुझ्न गाह्रो हुने देखिन्छ, विशेष गरी English Medium को कारणले पठनपाठनको माध्यम भाषामा पनि समस्या देखिएको छ। दोस्रो र तेस्रो वर्षका पाठ्यक्रम व्यावसायिक (occupation-based) भए पनि प्रयोगात्मक पक्षमा मात्रै जोड दिइएको छ भने सैद्धान्तिक पक्षमा कमजोरी देखिन्छ। विषयवस्तु केही पुराना लाग्दछन् र बजारको माग अनुसार नयाँ सीप र प्रविधि समावेश गर्न आवश्यक छ। पाठ्यक्रमलाई समय सापेक्ष अपडेट गर्दै सीपमुखी बनाउन जरुरी छ 2 2. सामुदायको सहयोग, विद्यार्थीको रुचि, र बजारको सान्दर्भिकताको दृष्टिले प्राविधिक धार र CTEVT अन्तर्गतका कार्यक्रमहरू अत्यन्तै आकर्षक देखिन्छन्। यी कार्यक्रमहरूले "गरी खाने शिक्षा" मार्फत सीपमूलक शिक्षालाई प्रवर्द्धन गर्छन्, जसले विद्यार्थीहरूलाई आत्मनिर्भर बनाउन सहयोग	शिक्षामा सैद्धान्तिक ज्ञान धेरै र व्यवहारिक,प्राविधिक सिप कम हुनु 5. मेरो विचारमा प्राविधिक धारवाट लाभान्वित भएका छन् । किनभने विद्यार्थीको घर पाएक आफुले पढेको विद्यालयमा अनी कक्षा १० सकेपछी २ बर्षमा सकिने भएकोले आकर्षण बडी छ 6. • मिल्दोजुल्दो हुन अति आवश्यक छ साथै परीक्षा, पाठ्यक्रम, र मूल्याङ्कन प्रणाली पनी एकै खालको हुन आवश्यक छ, • एउटा स्वायत्त वा माहाशाखा स्तरको संरचना खडा गरी सबै कार्य सोही निकाएवाट गर्ने 7. • पाठ्यक्रम अन्य निकाए (विदेशी) सँग सामञ्जस्यता हुने गरी निर्धारण गर्ने,,• पठ्यकरमलाई नेपालको बजारको माग र आकंक्षा अनुरुप बनाउने, • प्राविधिक धारलाई विशेष गरी व्यवहारिक सिप सिकाइको माध्यमको रुपमा अगाडी बडाउने

		insufficient teaching materials, limited industry collaboration, and inadequate focus on practical skills like internships or OJT. Teacher retention and commitment also pose issues, impacting program consistency. Robust evaluation practices and resource availability are critical for addressing these gaps 5. Reduce the emphasis on broad economic theories (e.g., classical theories of demand and supply) that are less directly applicable to farm management. Instead, prioritize practical topics like cost-benefit analysis and budgeting tailored to livestock and agricultural enterprises; Include a chapter focusing on the use of digital tools like farm management software, IoT-based livestock monitoring, and mobile apps for market price tracking. This would equip students with skills to leverage technology for efficient farm operations		पशुपन्छीहरूमा आउने रोगको निराकरण गर्ने, उत्पादन र उत्त्पादकत्व बढाउन यस कार्यक्रमले सहयोग पुर्याएको छ । प्राविधिक विषयको ज्ञान भएकोले विदेशमा समेत दक्ष जनशक्तीको रुपमा राम्रो रोजगारी पाउने सक्नेछन । व्यवहारिक ज्ञानमा जोड दिए अझ सहयोगी हुने थियो जस्तो लाग्छ 6.	गर्छ। साधारण शिक्षाको तुलनामा रोजगारीको अवसर बढी हुने भएकाले समुदायले पनि यस्ता कार्यक्रमप्रति चासो देखाउने गरेको छ। विद्यार्थीले आफैं रोजेको सीप र रुचिको आधारमा अध्ययन गर्न पाउने भएकाले सिकाइ प्रभावकारी हुन्छ। बजारमा आवश्यक जनशक्ति उत्पादन गर्ने भएकाले यस्ता कार्यक्रम अत्यन्त उपयोगी र व्यवहारिक छन् 3. प्राविधिक कार्यक्रमहरूमा सामान्यतया न्यून भर्ना दरको प्रमुख कारणहरूमा जनचेतनाको कमी, बसाइँसराइ, उच्च शुल्क दर, र यातायात सुविधाको अभाव प्रमुख छन्। धेरै अभिभावक तथा विद्यार्थीहरूलाई प्राविधिक शिक्षाको महत्व र रोजगारीका सम्भावनाबारे स्पष्ट जानकारी नहुँदा भर्ना कम हुन्छ। ग्रामीण क्षेत्रबाट बसाइँसराइका कारण विद्यार्थीहरू बीचमै पढाइ छाड्छन्। साथै, निजी संस्थामा प्राविधिक शिक्षाका लागि लाग्ने शुल्क धेरै हुने हुँदा सबैले भर्ना गर्न सक्दैनन्। यातायातको असुविधाले पनि टाढा बस्ने विद्यार्थीहरूलाई नियमित रूपमा विद्यालय जान कठिन	

		and decision-making, aligning with modern agricultural trends in Nepal 6. The CTEVT curriculum needs improvement in market-oriented skills, digital technology integration, and practical training. Outdated content and weak industry collaboration limit students' employability. Regular updates and stronger industry ties are essential for relevance 7. Students choose CTEVT programs for their practical focus and job-oriented training compared to CDC's academic emphasis. CTEVT attracts more students seeking quick employability, while CDC appeals to those pursuing academic pathways. The technical stream (9-12) is more popular due to increase awareness and accessibility in school level 8. Alignment between the technical stream (9-12) and CTEVT's pre-diploma/diploma is weak due to differing focuses.			हुन्छ 4. कार्यक्रम कार्यान्वयन गर्दा विभिन्न चुनौतीहरूको सामना गर्नु सामान्य नै हो। यस क्षेत्रमा भौगोलिक विकटताका कारण LAB मा आवश्यक प्रयोगशाला सामग्री, उपकरणहरु उपलब्ध गराउन कठिन भयो। यो शिक्षालय दुर्गम क्षेत्रमा सञ्चालन भएको हुदा कहिले काहीँ समयमै दक्ष शिक्षक व्यवस्थापन गर्न नसकिँदा शिक्षण सिकाइ प्रभावकारी हुने। विभिन्न उद्योगहरू, संघ संस्थाहरुसँग सहकार्यको प्रयास गरी OJT मा विद्यार्थीहरू पठाउँदा केही संस्थाहरूले विद्यार्थी वा शिक्षालयसँग पैसा माग्ने जस्ता समस्याले थप चुनौति सिर्जना गरेको छ। प्रयोगात्मक अभ्यासका लागि पर्याप्त सुविधा नहुँदा सिकाइ प्रक्रिया थप प्रभावित बन्ने गरेको छ। यस्ता चुनौतीहरूले कार्यक्रम प्रभावकारी रूपमा कार्यान्वयन गर्न अवरोध उत्पन्न गरेको छ5 TEVT प्राविधिक शिक्षाको मेरुदण्ड हो। मेरो विचारमा कार्यक्रमका व्यवस्थापकीय क्षेत्र, शिक्षकको गुणस्तर, र विद्यार्थीको संलग्नता क्षेत्रमा सुधार आवश्यक छ।	

		The technical stream emphasizes foundational theory, while CTEVT prioritizes practical skills. Better curriculum integration and shared learning outcomes could improve coherence 9. CDC’s curriculum is academically heavy, while CTEVT focuses on practical skills, creating gaps in entrepreneurial training. Overlaps exist in basic science topics, causing redundancy, and inconsistencies arise in practical application depth. Harmonizing career-oriented goals and streamlining content could address these issues 10. Harmonizing CDC and CTEVT curricula is crucial to avoid redundancy and ensure smooth transitions. This can be achieved by aligning learning outcomes, integrating shared modules, and involving industry experts. Joint curriculum reviews would ensure consistency and relevance 11. Incorporate more			व्यवस्थापकीय कमजोरीले कार्यक्रमा कार्यान्वयनमा बाधा पुर्यागउँछ, शिक्षकको सीप र दक्षताको अभावले शिक्षण गुणस्तर कमजोर हुन्छ, र विद्यार्थीको इच्छाशक्ति तथा सक्रियता कम हुँदा सिकाइ प्रभावकारी हुँदैन। यसकारण, यी क्षेत्रहरूमा सुधार गर्दा प्राविधिक शिक्षालाई व्यवहारिक, परिणाममुखी र श्रम बजारसँग सम्वन्धित बनाउन सकिन्छ। साथसाथै, विद्यालय तहको प्राविधिक धार (९-१२) र CTEVT को पाठ्यक्रमको समन्वय गर्दा सिकाइ निरन्तरता कायम हुन्छ 6. मैले विद्यालय तहको प्राविधिक धार (कक्षा ९–१२) र CTEVT अन्तर्गतको (प्रि-डिप्लोमा तथा डिप्लोमा तह) दुबै पाठ्यक्रमको अवलोकन गर्दा केही समानता र केही भिन्नता पाएको छु। दुबै पाठ्यक्रमले सीप विकासमा जोड दिएका छन्। तर, विद्यालय तहको प्राविधिक धार तुलनात्मक रूपमा बढी सैद्धान्तिक (theory-based) छ र व्यवहारिक कार्यशाला कम समेटिएको छ। अर्कोतर्फ, CTEVT को पाठ्यक्रमले विद्यार्थीमा ज्ञान	

		industry-relevant topics and digital tools to enhance curriculum breadth and depth. Increase practical training and internships to improve skill application. Regular revisions and stakeholder input will ensure comprehensive, market-driven content			(knowledge), दृष्टिकोण (attitude) र सीप (skill) को विकासमा विशेष ध्यान दिइ व्यवहारिक पक्षलाई बढी प्राथमिकता दिएको पाएको छु। जसले CTEVT लाई बढी सीपमुखी र व्यावसायिक बनाएको 7. विद्यालय तहको प्राविधिक धार (कक्षा ९–१२) र CTEVT अन्तर्गतका पाठ्यक्रमहरूबीच सामन्जस्यता मिलाई पाठ्यक्रम सुधारका लागी निम्म सल्लाह दिन चाहन्छु: पहिलो, राष्ट्रिय स्तरमा प्राविधिक शिक्षा समेट्ने एउटै नीति निर्माण गर्नुपर्छ, जसका लागि TEVT ऐन ल्याइनु अत्यावश्यक छ। दोस्रो, पाठ्यक्रम विकास गर्दा ILO को मानक अनुसार दक्षता आधारित तालिम समेटिनुपर्छ। तेस्रो, विद्यालय तहदेखि नै CTEVT सँग मिल्दोजुल्दो विषयवस्तु समावेश गरी पाठ्यक्रम नक्साङ्कन र विश्लेषण गर्नुपर्छ। अन्त्यमा दुवै प्रणालीलाई एउटै संरचनामा रूपान्तरण गरी दक्ष जनशक्ति उत्पादनमा एकरूपता ल्याउनुपर्छ।	

Paanchthar	CTEVT / Civil	1. Old curriculum and excessive course and learning areas however the course is demanding 2. Mechanical portion of the course is a bit high and it is equally harder to comprehend the courses 3. No mismatch is there 4. Challenging to retain the teachers and instructors, coordination and collaboration is also difficult 5. Heavy structure analysis to be taken out and add light structure design, RCC structure only to be revised and earthquake resistance structure to be shared and added up, optimum use of local resources while constructing the infrastructure 6. Avoid the challenges for the coordination and collaboration with industries and businesses 7. Generate opportunities after learning with the local level skills prevailing in, would be easier either to use their skills in the foreign land as well 8. OJT is not well managed	1. For our employment purpose and to generate our livelihoods better 2. We are well aware with the curriculum and it is much adequate to get the employment upon successful accomplishment by the government and the authority. Theoretical portion in the course is high but practical is less however there is 50/50 mentioned in it 3. Chemistry is not required in the course 4. Actually the subjects are not to taken away but to manage and arrange properly for better as well as effective learning model, Topic for estimation is required and to be added, arranging and managing the local level curriculum as well as in the international market, course need to be general as well as simple 6. Theories are high in number so it should be more like practical one, the skills gained while learning should be utilized both in local as well as international	1. The content for physics, RCC structure, Allied mechanics, mechanics of structure and other similar course have been studied in the school 2. Not only the individual but the entire nation could be independent after having skill transformed to the people in the community after the training and vocational education 3. Not only the students but also the parents are well aware of the importance and value of the education system 4. Learning materials and other resources are adequately available, course	1. Some course content found in grade 9, 10 transferred to grade 11 and 12 however the content missed there to be fulfilled by CTEVT 2. The students grade 8 are too young and they are often undecided while joining for grade 9, so it is hard to make them well understood. 3. Parents are not understanding about the technical education and its value, they are thinking this subject of much harder, thinking of going for 11 and 12 by the high scorer in SEE 4. It is hard to hire and select the required	1. The program is much effective, since it provide students with the required skills and they can align in the labor market not only in the local level but global. 2. Technical stream has more theory whereas the course from CTEVT has more practical approached prevailing 3. Assessment would be done through internal and external through paper pencil test in 9-12 technical stream whereas it is assessed through the skills one is deserved with 4. People have been conceptualizing to get the job or the career progression of their choice right after the graduation 5. Science, mathematics and repair and maintenance training program to be arranged and conducted 6. To strengthen the technical education we

		and functional, management of expenses for food, travel etc 9. Entrepreneurship concept is not adequate, weightage of the course is also different 10. Alignment is much required and the learning about the entrepreneurship is less functional 11. Course is comparatively big and maintaining both breadth and depth in the content but it is essential to review it timely and effective	level 6. The course for OJT need to be revised so that people can learn a lot 7. The quality is in progress but there are still some areas to be improved by adding content for employment and entrepreneurship 8. People are attracted and also easy to get the employment and we indeed recommend for the upcoming batch 9. Teachers are also need to be skillful, less practical opportunity while learning the content, low level of materials and resources, no coordination and collaboration with industries, Laboratory is in place for learning 10. I have seen the curriculum for pre-diploma level but don't know the difference 11. All the contents are relevant but required course content need to be managed, language of curriculum need to be simple and effective	is free to pursue, 5. The course is much helpful but the course for 9th grader is not maintaining the level as it is relatively harder to learn and gain knowledge out of this course for them. It needs to be revised and maintained. 6. It would be nice if we could add diploma program in our school, need assessment of the teachers and human resource management, the course for 9-12 should be well maintained, dissemination of the information from awareness program, attractive package for students, both the curriculum from global as	number of competent teacher, management of materials and resources, not having industries for practical learning 5. Training for trainers, instructors and teachers, and it is hard for students to learn the content, space for laboratory 6. Not assessed the curriculum of CTEVT however they are not much effective 7. It would be good to start from Grade 11 and 12 not from 9 and 10 and it would be convenient for them to go for OJT and learn better	need to start it from the earlier grader students so that they can easily grab the content of grade 9 and so 7. One municipality one technical school concept has made this program not much convenient, 7. As it is quite difficult to get the teachers for maths and science, the course for diploma is also essential above 9-12 technical stream

				well as local level to be collaborated		

Annex VI: Disciplinary Content Comparison Matrix

Plant Science

Technical Stream Contents	Work Hour	Pre-diploma (CDC aligned Contents)	Work Hour	Diploma (CDC aligned Contents)	Work Hour
Grade 9: Agriculture Extension and Computer Science	128	Subject 1: Agriculture Extension and Community Development Subject 2: Agriculture, sericulture and mushroom cultivation 3. Plant protection, IPM and FFS	27	Subject 1: Computer Application Subject 2: Social mobilization and community development Sub3: Agriculture extension and communication	130
Introduction: Definition, Discussion on importance, formal and non-formal education, objective, importance and role of extension in agriculture development	4	**Define extension education**: Principle, objective, importance and philosophy **Explain teaching learning process**: Methods, plan, learning in extension, adult farmer law of learning	10		

Communication: Concept, methods and roles	4	**Communication with farmers**: Definition, elements, barriers, diffusion process, adoption and innovation process, individual, group and mass communication **Explain skill needed for ELF**: Communication skill, effective listening, acceptance of feedback, consideration at time of presentation	9		
Basic sociological concept: Definition and importance, Terminologies used, concept and history and objective	5			Basic Sociological concept	15
Extension program planning, monitoring and evaluation: Definition and meaning, Principles and importance, program M&E,	3	Explain participatory planning: Introduction of participatory planning, monitoring and evaluation (PPME)	4	Program planning, monitoring and evaluation in extension	6
Group and rural leadership: Concept, meaning, characteristics and procedure for group formation	5			Leadership development: Meaning, concept, type, basic elements, importance, qualities, characteristics, role leader in community development, selection and development of local leader	6

Gender and development: Introduction, need and its importance, roles of gender, concept of WID, WAD, GAD	6	Explain Gender and Social Inclusion: Definition, equity and equality, GESI principle, involvement of women and DAG in AFEC group and different committee	2	Meaning and concept of gender and sex, origin and Nepalese context, concept of WID, WAD and GAD, gender roles, needs and strategy, policy, plan budget	6
Introduction to computer: Concepts, history, capabilities and limitation, Types of computers and generations	4			History, generation and types of computer and hardware and software	2
Computer system: Basic components, Memory-ROM and RAM, storage devices and all hardware in the system	6				
Operating system: Introduction, Windows oS, open source oS	6			Importance, types, functions, MS-DOS, window operating system, Linux, GNU, open source operating system, device driver	6
Multimedia: Introduction, components and application	9	Functions of electronic audio visual aids: Function & parts of ECD projector, OHP etc. Function and use of multimedia	2		

Computer net works and topologies: Introduction, types, topologies and use	6			Networks and internet: Introduction, advantages, LAN, MAN and WAN, LAN topologies, Bus, Ring, Star, mesh, tree and hybrid transmission media	7
Internet and its application: Introduction, web browser and websites and application of internet	6			LAN topologies, Bus, Ring, Star, Mesh, Tree and hybrid,	2
Grade 9: Principle of Agronomy	128	Subject 1: Crop and Crop seed production Subject 2: Plant Protection IPM and FFS, Sub3: Agriculture Ecology and Sustainable soil management: Farm machinery, structure and irrigation		Subject 1: Fundamentals of Agronomy	
Introduction to Agronomy: Definitions, Importance and roles of agronomy in Nepalese context	6	Define agronomy, identify field crops, classify crops	12	Agronomy, definition, scope and role in food security Basis of classification and crop classes	5

Climate and ecozones: Definition, types, classification, effects and introduction to climate change	9	Define weather/climate: definition, importance, rainfall, temperature, humidity, sunshine, wind etc. reports, analysis, effects	16	Climate and weather: Solar radiation and relation to greenhouse effect Temperature and Growing Degree Days, Soil temperature Precipitation, Wind and Relative Humidity Seasonal variation in Nepal and effect on Agriculture	7
Fundamental of soil: Definition, properties, essential elements of plants	8	4 major components of soil, parent material of soil, soil horizon, texture, moisture, lab test,pH	21	Soil factors: concept of land/soil suitability, (more in course: Fundamentals of Soil Science	3 + (60 T +30 P)
Tillage: Definitions, purpose and importance and types	5	Definitions, identification, handling of tools/equipment, repair and maintenance, plough	15	Tillage operation, Meaning, definitions, types, tools, equipment, practices	10
Namure and fertilizer: Definitions, importance, types and definition and importance of chemical fertilizers	10	Definition and explanation of common causes in decreasing fertility, role of nitrogen, phosphorous, potassium, micronutrient, compost,	19	Plant nutrient management: manures and fertilizers, fertilizers; Organic manures and biochar	17
Cropping system: Definition, Mono cropping, mixed, relay, cropping scheme, rotation, intensity and index	5	Prepare timeline, calendar, livestock patterns, land-use, rotation, mixed cropping etc.	11	cropping scheme (cropping calendar in the course: **Agriculture Entomology course**)	17

Water and weed management: Introduction, importance of water, irrigation systems, critical stages of moisture requirement, drainage concept, objective and importance, rain water harvesting, definition for weed, losses and benefits of weeds, management, advantages and disadvantages	12	Water erosion, mixture with chemical, water requirements, water holding, centrifuge system, identify, classify, control	12	**Field water management (**Soil moisture constants, Irrigation and types of irrigation, Drainage and types of drainage) **Weed in crop production (**Weeds and their effect on crop production , Problematic weeds in Nepal , Weed management: Cultural and Physical weed management , Weed management: Chemical weed management)	3+8
Farm mechanization: Concept and uses, tractor and farm machines, seed drill, tools and machine use and harvesters	9	Farm mechanization in Nepal	2	Farm mechanization (in courses: **Soil Fertility Management/ Management of farm resources/** Irrigation, Farm Mechanization and Farm Structure)	4+2+7
				Harvesting, Storage and post harvesting technology **Sustainable agriculture** **Plant Nutrient Management**	

Grade 9: Basic Horticulture	128	Subject 1: Plant protection and ornamental horticulture Subject 2: Fruit cultivation, post harvest horticulture and plantation crop	59	Subject 1: Fundamentals of horticulture Sub2: vegetables and spice crop production Subject 2: Ornamental horticulture, Sub3: Soil fertility management	70
Introduction: Definitions and meaning, Importance, scope, classification of horticulture plants, fruits, vegetables and flowers	7	Meaning, definition, branches and types, importance, identification of niches, climatic factors	6	Status, importance, scope in Nepal, pomology, roles,	10
Climate: Concepts, environmental factors as temperature, light and rainfall, humidity etc.	5				
Home garden and small scale farming: Definition, difference between home garden and kitchen garden and crop selection	3	Garden design, prepare bonsai, seasonal flower, prepare lawn	18	Importance, scope, characteristics, component, kitchen garden, roof top, crop selection, crop calendar	5

Organic Farming: Concepts and definitions, principles, methods, advantages and disadvantages	4	Concept of sustainable agriculture and organic farming, importance, scope and practices	3	Concept of organic agriculture and constraints of organic farming in Nepal, sustainable agriculture for organic farming and Permaculture	4
Orchard management: Introduction, training and pruning, methods, soil management, matching techniques, soil fertility and windbreak	12	Perform orchard management practices-clean cultivation, intercropping, soil culture and basin preparation	10		
Plant growth and development: Dormancy concepts and causes, methods, germination, flowering, vernalization, maturity, juvenility, fruiting	12	The role of plant growth regulators (PGR), definitions, types, concepts, role of PGR	1	Introduction to soil fertility with definition, concept, overview, historical development, limiting factors for growth and development	5
Plant growth regulators: Meaning and definitions, types, functions, importance and commercial use of PGRs in fruit crops	6	The role of plant growth regulators (PGR), definitions, types, concepts, role of PGR	1	Pesticide act-current act, rules, regulations and standards, banned pesticides listing and licensing pesticide	3

Harvesting and post-harvest handling of fruits: Maturity judgments, harvesting and its techniques, post harvest handling, storage and marketing	8	Harvest fruit crops: maturity indication, picking methods, sorting/grading, packing and storage; handling post harvest-cleaning, value addition, storing and transporting, anti disease of post harvest,	9		
Preservation of fruits: Principles of preservation, canning and bottling	4	Definition, importance of preservation of fruit and vegetables	9	Processing and preservation of fruits and vegetables, principle and practices of canning and bottling, preservative addition	10
Advanced horticulture: Protected cultivation, importance and problems, hydroponics, Aeroponics	3	Definition, branches and types, importance,	2	Ornamental horticulture, common terminologies, meaning, importance, scope and status in the national context	3
Grade 9: Plant Protection	128	Subject 1: Crop and crop seed production Subject 2: Vegetable and vegetable seed production Sub3: Plant protection IPM FFS	244	Subject 1: Introduction Subject 2: Agriculture entomology sub3: plant pathology and mushroom cultivation	176.5

Introduction: Concepts and related definitions	6	Plant protection: Definition principle, practices and importance, plant diseases, condition for outbreak	5	Plant protection equipment, types sprayers and dusters, calibration, troupes, cause and remedy, maintenance and troubleshooting	6
Insects: Definitions, characteristics and features, life cycle and metamorphosis, classifications and natural enemies	9	Life cycle of insects pests-complete and incomplete life cycle, classification, condition of insect outbreak, calibrate sprayer, insect diseases,	13	Introduction to entomology-definition, importance scope, concepts of pest, insect and pesticides, harmful and beneficial insects, dominance of other animals	4
Diseases: Meaning, disease cycle, plant pathogen background and disease triangle	6	Manage common bacterial/mycoplasma diseases, other common diseases, disease triangle and their management, viruses and vector management, post harvest pest and diseases	8	Causes of plant diseases-introduction to fungus, bacteria, nematodes, virus, abiotic factors, infectious and non-infectious, pathogenicity, cause of disease development, classification, crop disease and their management, disease of mushroom	17

Weeds: Definition, types, effects on crop production, competition for water nutrient and sunlight, air etc.	5	Definition, harmful effects to crops; classification on the basis of life cycle, types, economic, annual, biennial, season, control of weeds	12	Weeds in crop production, problematic weeds, cultural and physical weed, chemical weed management, weed in crop production-identification, assess the damages preparation of herbarium for major weeds, intercultural operation and familiarization of herbicides	11
Pesticides: Definition, types, forms of pesticide, calculation, methods, harmful effects of pesticides, safe use and misuse, poisoning symptoms, first aid measure, list of banned pesticide	10	Classify, characteristics, doses, identify,	8	Pesticides in agriculture, formulation, toxicity, calculations, compatibilities, farmers practices on the uses, poisoning symptoms; methods, types, general features, seed treatment	10
Plant protection appliances: Introduction, plant protection appliances, proper handling	5	Plant protection equipment- sprayer and its parts, hand compression sprayer, its capacity, use and maintenance, foot sprayer, handle tools/equipment	8	Plant protection equipment, types sprayers and dusters, calibration, troupes, cause and remedy, maintenance and troubleshooting	3

Plant pest management: Explanation of the principles of plant pest management with methods as physical, mechanical, cultural etc.	5	Integrated pest management and crop production; Run FFS-pest management	6	Integrated pest management,	2
Crop management; Definition, concepts, importance, principle	8	Identifying field crop, classifying, crop growth,	10	Crops and their classification; Important insect-pests of crops and their management	8
Mushroom cultivation: Importance and scope, types and enumeration of poisonous and nonpoisonous mushroom,	10	Background and Importance of mushroom cultivation	1	Introduction to mushroom cultivation with morphology, importance, scope, problem and constraints and poisoning level; Practices of mushroom cultivation together with its types, characteristics etc.	13
Grade 10: Industrial Agriculture and fish Culture	128	Subject 1: Apiculture, Sericulture and mushroom cultivation Subject 2: Aquaculture (Fish production)	132	Subject: Fundamentals of aquaculture and fisheries Subject 2: Industrial entomology	72.5

Beekeeping: Introduction, scope and importance, types and varieties of bees, life cycle, bee colony and management, selection of hive and baiting, colonization and stocking, swarming, combs and their management, pest, predators and disease, hives and their types and foraging of bees	20	Introduction, different species of honey bees, classification, characters, history, objective, present scenario, identify potential area for bees, common forage, explaining communication, until it comes to market chain	41		
Sericulture: Introduction, scope and importance, mulberry cultivation, silkworm rearing, young age silkworm rearing, late age silkworm rearing, cocoon introduction, quality characteristics and classification and silk production etc.	12	Definition, concept, scope, importance, species, designing structure, mulberry varieties, harvesting mulberry to supply to market chain	23	Introduction, life cycle of mulberry, silkworm and its management	2.5
Fish culture introduction: Definitions, importance and scope of fish culture in Nepal, indigenous and exotic fish species and their identification	8	Definition, classification of species, fish farming history, scope and economic importance, function of each part of fish	19	Introduction to fisheries-definitions, characteristics, morphology, taxonomy etc., monoculture, polyculture, raceway culture	17

Fish pond: Pond construction, management, aquatic weeds, fish predators and their control methods,	10	Construction, types, maintenance	9	Water quality and pond management-temperature, dissolved oxygen, pH, plankton, liming, fertilization, food and feeding, aquatic weeds, predatory fish and their control	10
Fish Culture System: Mono culture, Poly culture of fish and its importance, common fish disease, prevention and treatment	7	types of fish and culture, paddy , duck cum fish culture, pig cum fish culture, fish breeding concept, fingerling production, favorable condition for breeding to supply to the market chain	32	Fish breeding-role of fish seed, identification, types, natural, semi-artificial and artificial breeding, induced, spawning, incubating, hatching, transferring	10
Fish preservation and marketing: Harvesting method, use of ice for fish transport, fish packaging method and fish transportation method	7	Harvest, anomalies in fishing, poisoning, explosion, electric current, time for harvesting and marking channel, fish market, pricing, customer behavior, record keeping for production, cost, sales, and health, develop annual calendar	8	Common fish diseases and parasites-types, fish disease, infections	3

Grade 10: Food Crop Production	128	Subject 1: Crop and crop seed production	111	Subject 1: Fundamentals of Agronomy Subject 2: Fundamentals of soi science Subject 3: Soil Fertility Management Sub4: Grain legumes and oilseed crops	112
Introduction: Definitions, concepts and importance, geographical distribution of agronomical crops	8	identification of field crops, classification of grain, legumes, cash, oil, industrial etc.	12	Introduction to vegetables, fruit and basic classification of crops, production,	12
Cultivation of cereal crops: study of rice, wheat, maize millet, buckwheat and barley etc.	24	Introduction, origin, definition, practices,	30	Introduction of cereal, rice physiology, climate and edaphic requirement, maize, wheat, finger millet, buckwheat	30
Cultivation of oilseed crops: Studying detail on rapeseed, mustard, sunflower, linseed, ground nut	16	Oilseed-groundnut, linseed, sunflower cultivation	7	Introduction, definition and terminologies, importance, status and constraints, sesame, sunflower, niger, castur	10
Summer and winter grain legume production: Study of lentil, chickpea, cowpea, pigeon pea and soyabean	16	Developing a calendar for rice, maize, wheat, potato, millet, collection of seed, land preparation, cultivation, harvesting and storage	32	Introduction, winter grain, summer grain, rainy	12

Miscellaneous		Buckwheat, millet, pulses	30	Oil seed crop importance, status, rapeseed and mustard, soybean, groundnut, sunflower, ag, cowpea, rice bean sesame etc.	18
Grade 10: Horticulture Crop Production	128	Subject 1:Fruit cultivation, post-harvest Horticulture and Plantation Crop Subject 2: Fruit cultivation, post harvest horticulture and plantation crop	121	Subject 1:Fundamentals of horticulture Subject 2: Vegetable and Spice Crop Production 3: Fruit crop production	191
Introduction: Specific horticulture crops in Nepal, potential crops, constraints in commercial crop production and possible remedies	4	Definition, meaning, branches, importance	10	Introduction- status, importance, scope, pomology, olericulture, floriculture, role of horticulture, policy, organization both governmental, private and non-governmental organization	10
Cultivation of tropical fruit crops: Introduction, uses, origin and distribution, varieties, soil and climate, propagation methods and cultivation practices of Mango, Papaya, Litchi, Pineapple and Banana	15	Cultural practices for tropical and sub tropical fruit, mandarin orange, sweet orange, lime, lemon, pomegranate, kiwi, litchi, banana, papaya, pineapple, guava etc.0	10	Tropical fruit cultivation practices- mango, banana, papaya, jackfruit, litchi, coconut, avocado	7

Cultivation of sub-tropical fruit crops: Introduction, uses, origin and distribution of Mandarin orange, sweet orange and lime	5	Cultural practices for sub-tropical fruits	10	cultivation practices of sub-tropical fruits-mandarin orange, sweet orange, lime, lemon, guava, pomegranate, crapes	7
Cultivation of temperate fruit crops: Introduction, uses, origin and distribution, varieties of apple, pear, grapes	7	Cultural practices for temperate fruits-apple, pear, walnut, peach etc.	1	Mild temperate-pear, peach, kiwi, persimmon, strawberry, apple, walnut, almond	8
Cultivation of cole crops: Introduction, origin and distribution, varieties, soil and climate, nursery bed preparation and cultural practices for cauliflower, broccoli, cabbage	5	Different crops	2	Importance of home garden, scope, characteristics, component, materials and equipment used, layout preparation, site selection, crop selection-cauliflower, cabbage, broccoli etc.	5
Cultivation practices of root crops: Introduction, origin and distribution, varieties, soil and climate, nursery bed preparation, cultivation practices of radish and carrot	3	different crops	2	Root crops-radish, turnip, carrot and beetroot	5
Cultivation practices of leafy vegetable: Introduction, origin and distribution, varieties, soil and climate, nursery bed preparation, cultivation practices of broad leaf	4			broad leaf, mustard, spinach, cress, lettuce, coriander and Swiss chard	5

mustard, spinach					
Cultivation practices of solanaceous crops: Introduction, origin and distribution, varieties, soil and climate, nursery bed preparation, cultivation practices of Chili/capsicum tomato, potato	8				
Cultural practices of bulb crops: Introduction, origin and distribution, varieties, soil and climate, nursery bed preparation, cultivation practices of onion and garlic	3			Tuber and bulb crops-potato, onion and garlic	4
Cultivation practices of cucurbitaceous vegetables: Introduction, origin and distribution, varieties, soil and climate, nursery bed preparation, cultivation practices of bitter gourd, bottle gourd and cucumber	5			Cucurbitaceous crops-cucumber, sponge and ridge guard, bitter gourd, pointed and bottle gourd and watermelon	4
Cultivation practices of spices: Introduction, origin and distribution, varieties, soil and climate, nursery bed preparation, cultivation practices of ginger, coriander,	5	Growing spice crops-ginger, cardamom, turmeric crops	6	Major spices-cumin, coriander, fenugreek	4

cumin, cardamom and turmeric					
Cultivation practice of tuber crops		Tuber crop-potatoes	5	Potato onion, garlic	5
Cultivation of practices of leguminous crops		Characteristics of leguminous crops, relationship of crop rotation and soil fertility	5		
Cultivation of plantation crops		identification, list of plantation crops, importance,	10	classification, temperate, citrus, sub-tropical, fruit saplings, concept, needs of pruning and training	5
Grade 10: Floriculture and Nursery production / management	128	Subject 1: Plant propagation and Ornamental Horticulture Subject 2: …........	44	Subject 1: Ornamental Horticulture Subject 2: Fundamental horticulture	81
Introduction: Definitions and meaning, importance and scope, challenges, current status, classification	4	Definition, importance, classification, concept for indoor nursery	8	Background, common terms, meaning, importance, scope	3
Garden: Concept and meaning, scope, importance, types, concept and principle of landscape gardening, preparation and maintenance of lawn	4	list of nursery, site selection, measurement and calculation of area, nursery soil, mixing, soaking, sow seeds, care for nursery	8	Development, construction and maintenance, meaning, scope, definition, importance, classification	8

Ornamental plants: Cultivation with respect to uses, variety, soil and climatic requirement, planting, maturing, training and pruning, disease and insect pest control, harvest and post-harvest of gladiolus, rose, carnation, gerbera, tuberose, marigold, chrysanthemum, orchid and for indoor gardening: selection and maintenance, pot culture and hanging basket, bonsai, its criteria and classification, types post harvest management and vase life	20	Identification of ornamental plants,	4	Introduction, meaning, importance and scope, classification, cultivation practices, planting, manuring, training and pruning, disease and insect control	18
Introduction to nursery: Definition, types, discussion on scope and importance of nursery	1	Identification of ornamental plants,	4	Nursery management, definition, meaning, importance, types, selection of site and layout, manure application, bed preparation and soil treatment, seed treatment	4
Nursery media: Characteristics, properties and use of soil, sand, compost, vermiculite, sphagnum moss, mixture for container growing, treatment of media and mixes	3	Definition and meaning, types of ornamental garden, component of nursery	2	Nursery status, definition of growth media, characteristics, tools and equipment, structure, green house, propagation structure	4
Nursery containers: Clay pots, plastic pots, polyethylene	3	Bonsai, importance, types and	2		

bags, jute bags, cemented bags		methods			
Nursery structures: Hotbed and cold frame, Poly tunnel, Greenhouse and glass house	5		4	Green house, shade house, lath house and their use	2
Preparation from seeds: Advantages and disadvantages, collection of seeds, seeds viability and germinating, seed dormancy and its causes, breaking seed dormancy, preparation of seedbed, seed bed treatment and sowing, care and maintenance of seedling, packaging and marketing	9	Tools for propagation, nursery tools, training and pruning and their uses	6	✗	
Vegetative propagation: Reasons for using vegetative propagation and methods of propagation	15	Classification, cuttings, layering, grafting, budding, definition, importance, types, list of plants	6	Plant propagation and nursery establishment, methods of sexual and asexual propagation, seed, vegetative parts, curing, layering, grafting, budding, tissue culture etc.	4
Grade 11: Farm Machinery and Seed Technology	128	Subject 1: Farm machinery, structure and Irrigation Subject 2: Crop and crop seed production		Subject 1: Seed Technology Subject 2: Fundamentals of Agronomy 3: Irrigation, farm mechanization and farm structure	80

Introduction: Meaning and concept, importance and scope, types of farm machinery, limitations of farm mechanization	4		2	basic concepts, definition, roles, goals, relationship to other sciences, importance and scope, quality, characteristics, types	5
Tillage: Definition, objectives and classification, specialized tillage tools, transplant	7	Explain tillage, objective, identify equipment used for tillage, list of tillage equipment and functions	3	Tillage and its types, basis of tillage implementation, tools and equipment,, minimum tillage and practices for conservation of farming	8
Plant protection equipment: Sprayers and its type, hand sprayer, knapsack sprayer, foot-operated sprayer, duster and its types, care and maintenance of sprayers and dusters	8	Sprayer and its parts, hard compression sprayer and its capacity, use and maintenance, knapsack sprayer, reading pesticides literature, libel of pesticides, precautions, list of banded pesticides, poisoning and first aid knowledge, predators and parasites	6	Plant protection equipment, sprayer, dusters, types, care, troubleshooting and maintenance, calibration of sprayers and its importance	3
Harvesters and threshers: Introduction, methods for threshing, types, combined harvester	6				
Farm tractors and their management: Tractors and its types, care and maintenance of tractor	4				

Seed technology: Definitions, differences between seed and grain, importance and scope, seed quality and its determinants, types of seeds, classification of see	8		12	Basic concepts, seed, grain, quality, roles, goals, relationship	8
Seed dormancy: Meaning, causes and breaking of seed dormancy	4			Seed growth, dormancy, germination, vigor and longevity	6
Principles of seed production: Genetic and agronomic principles of seed production, principles and schemes of nucleus breeders and foundation of seed production, hybrid seed production	10	Developing calendar-rice, maize, wheat, potatoes, millet, collection of seed, land preparation, seed grading, seed rate, seed treatment	8	Genetic and agronomic principles of seed production, hybrid seed production	8
Seed drying, cleaning, upgrading, testing: Methods and procedures of seed drying cleaning, grading and seed testing	8	Field inspection, rouging, insect pests and diseases control, harvesting, curing, threshing, extracting of seeds, cleaning, drying, packing	6	Drying, cleaning, upgrading, testing	6
Seed certification: Procedure of seed certification in Nepal	5	Grow vegetable for seed production-site selection, source of seeds for seed production, cultural practices, types, breeds ,foundation, certified, seed registration, certification and labelling	4	Certification, legislation and intellectual property rights	6

Grade 11: Soil Fertility and Nutrient management	128	Agriculture Ecology and Sustainable Soil Management Subject	16	Soil Fertility Management Subject	63
Introduction: Soil fertility and productivity, problem of soil fertility, fertility status of soil, concept of plant nutrient and basic and common terminologies required	9	Soil fertility- importance, role of organic fertilizer, factors affective fertility as rainfall slope, wind etc. advantages and disadvantages of compost v/s chemical, decomposition	8	Definition, concepts, overview, limiting factors, yield potential and yield gap	5
Soil acidity and liming: Source of soil acidity, reason, liming materials and their use, factors affecting lime relation in soil, soil salinity	10	Use of lime to neutralize the pH value	2	Soil pH and acidity and types	2
Nutrition: Introduction and the function, essential elements and categories as per the plant's primary, secondary need and tracing, function and deficiency symptoms, source of nutrients, organic manure, chemical fertilizers, organific fertilizers and integrated nutrient management	20	Preparation of calendar of operation for a kitchen garden in a locality;	4	Definition, primary and secondary plant nutrients, sources, functions and deficiency symptoms, visual symptoms, plant tissue analysis, soil tests and fertility evaluation	20
Soil conservation: Introduction, definitions and its types, causes of soil erosion, soil erosion and crop production, importance,	11	Adopt soil conservation practices- SALT (Slopping agriculture land technique)	2	Structural management in arable soils and soil conservation	2

practices of organic farming, counter farming, terracing etc.					
Soil pollution: Concept and meaning, behavior of pesticides and inorganic contamination, prevention and mitigation of soil pollution, organic farming for healthy soil	6			Causes, effect and control measures of soil pollution-bioremediation-tolerable limits for heavy metals in soil	2
Environmental studies: Concept and meaning, importance of environmental science, role of individual in conservation of natural resources, judicious use of resources for sustainability, organic agriculture for environmental health	8			Definition need, objective and scope of environmental studies,	2
Grade 11: Commercial Fruit Crop Production and Post-Harvest Technology	128	Subject 1:Fruit cultivation, post-harvest Horticulture and plantation crop	88	Subject 1: Fruit crop production Subject 2: Post harvest technology	114

Introduction: Definition of pomology, importance, scope and constraints of fruits, commercial horticulture and fruit eco-zones	6	Identifying minor/important fruit crops, Harvest fruit crops, maturity indication of major fruits, picking methods, sorting/grading, packing and storage, marketing, transporting system	8	Introduction, importance, potentialities and constraints, ecological regions and niches, classification	5
Orchard management: Introduction, layout, factors to be considered while establishing it as climate and weather, soil types and soil fertility, irrigation facilities, soil water conservation, inputs availability, availability of labor, transport facilities, marketing and storage facilities, establishing organic orchards,	9	Lay out of an orchard-square, rectangular, hexagonal, contour system, basic consideration while establishing and orchard	18	Orchard establishment, climate and weather, soil and land slope, irrigation and drainage facility, layout,	18
Cultivation of fruit crops: Cultivation of fruit crops considering, production, productivity, climate and the marketing of tropical, sub-tropical and temperate	32	Identifying, classifying fruit crops, ensure ecological niches	18	Area, production, climate, soil, tropical fruits, subtropical fruits, mild-temperate, temperate, cultivation practices of minor, indigenous and potential fruits	22

Maturity judgement and harvesting: Appropriate time and methods of harvesting as grading, labeling, flowering regulation, packaging and transportation and marketing	6	harvesting of fruit crops	4	Harvesting, handling, packing house operation, fungicide treatment, smoking, sulphuring, packaging and transportation, harvesting techniques and methods of crop cutting	10
Post harvest: Definition, meaning, importance and scope, principle of post-harvest technology	6	marketing of fruit crops	4	Scope and importance of post-harvest management-history, primary and secondary processing, scope and importance	5
Processing and preservation of horticultural crops: Principle and practices, practices for canning and bottling, preservation by adding of sugar, salt and other preservatives, addition of color and flavor	5	Definition, meaning and importance, types, wet and dry preservatives, beverage, alcoholic and nonalcoholic	7	Processing and preservation of fruits and vegetables-principles and practices of preservation, practices of canning and bottling, heat treatment and pasteurization, preservation by addition of sugar, salt and other preservatives	10
Grade 11: Agricultural Entomology	128	Plant Protection, IPM and FFS Subject		Agriculture Entomology	54

Introduction: Definitions, importance and scope	5			Definition, importance, scope, general concept of pest, insect, pesticides, harmful insects and beneficial, reasons for dominance of insects	4
Insects: General characteristics, classification as harmful and beneficial	5	Explanation, complete life cycle, classification, insect outbreak	5	General characteristics, classification, order and important families	6
Protection, measures against insects pests: Physical, mechanical, cultural, biological, genetic, regulatory, chemical, integrated pest management, organic pest management	14	calibrate sprayer/dusters, types, use, parts of sprayer, functioning and calibration, importance of beneficial insects, predators and parasites	8	Introduction, sprayer, dusters and its types, care, troubleshooting and maintenance, calibration, trouble, cause and remedy	6
Major insect pest of agronomical crops: Cereal cops, leguminous, oilseed etc.	15	Intercultural operationsmanaging insect pests and diseases	8	Major insects pests of mushroom and heir management, common diseases and their management	2
Major insect pest of horticultural crops: Vegetables, fruit crops, floriculture	25	Manage insect pests and diseases-identification of insect pests and their damages, application of appropriate control measures,	6	Important insect pests of crops and their management- rice maize, wheat, seasonal vegetables, mango, litchi, citrus,	6

Grade 12: Industrial Crop Production	128				77
Introduction: Meaning, concept, importance, scope, geographical distribution and comparative advantages with other crops	6	Introduction, meaning, classification, grain, legumes, cash, oil and industrial crops	10	Definition of commercial, importance and scope, global and national distribution of industrial crops	5
Cultivation practices of sugarcane and tobacco: Study of sugarcane and tobacco, its uses, economic importance, area of production, origin, climate, soil, varieties, seed treatment, time and methods of raising nursery bed	10	Calculation of cost and income of crop enterprise e.g. tea, jute, tobacco etc.	2	Introduction and economic uses, types, methods of planning, manure and fertilizers management, irrigation and weed management, insects, pests and diseases, harvesting and yield,	10
Cultivation practices of cotton and jute: Cultivation of cotton and jute related to its uses, economic importance, distribution, area of production	13	Fiber crop-jute and cotton, rape seed and mustard	6	Introduction and economic uses, climate and soil requirement, land preparation and sowing of jute, manure and fertilizers ,insects and pest and disease and their control	6

Cultivation practices of tea and coffee: Cultivation practices of tea and coffee related to its uses, economic importance, distribution, area of production, productivity, origin, climate, soil, varieties etc.	13	Pests management of tea and coffee	2	Introduction, climate and soil requirement, propagation, planting, manure, training, irrigation, insects, pest and disease control, harvesting, storage, processing and marketing	16
Cultivation practices of cardamom: Cultivation practices of coriander and cardamom related to its uses, economic importance, distribution area of production, productivity, origin, climate soil etc	8	Grow spice crop-cardamom	2	Introduction and economic uses, climate and soil requirement, propagation and nursery management, planting, manure and fertilizers management, pre-harvest intercultural in cardamom, insects and pest control, harvesting, processing and storage	8
Cultivation practices of ginger and turmeric: Cultivation practices of ginger and turmeric related to its uses, economic importance, distribution, area of production, productivity, origin, climate soil etc.	14	Crop spice crops-ginger and turmeric	4	Introduction to ginger, turmeric as a spices crops	2
Grade 12: Plant Pathology and Mushroom Production	128	Subject 1: Crop and crop seed production Subject 2: Plant protection, IPM and FFS			68

Introduction: Definitions, meaning and concept, importance, scope and objective, related terminologies, classification and disease triangle	4	Identifying common disease-name, sign and symptoms, methods of disease management, care for nursery from the disease		definition, importance, scope, general concepts and terminologies, roles of plant disease in yield reduction	3
Major diseases of agronomical crops: Cereal crops, Leguminous, oilseed crops	15	Control fruit diseases-identifying sign and symptoms	6	bacterial, virus and nematode	10
Major diseases of horticultural crops: Vegetables, fruit crops, floriculture	15	Disease Triangle, susceptible host, aggressive agent and their symptoms	3	Post-harvest management of major disease and disorders, methods of post-harvest loss measurement	10
Mushrooms: Importance and scope, types, characteristics and identification, spawn production	5	Introduction, importance, scope, characters , identification	3	Mushroom, morphology and importance, scope, problems and constraints and mushroom poisoning	3
Cultivation practices of mushroom: Button, oyster, paddy straw, Ganoderma and shiitake etc.	20	listing of commonly grown mushroom, harvesting, mushroom soup production, analyze benefit ratio	11	Types, mushroom spawn, common steps in mushroom production, cultivation practices of oyster, button, shiitake etc.	10

Disease and pest of mushroom and their management: Fungal, bacterial, viral, insect pest and nematode	5	✗		Major insects/pests of mushroom and their management, common diseases and their management	2
Grade 12: Agri-Economics	128	Farm machinery, structure and irrigation			60
Introduction: Definition, Adam, Smith, Marshall and Robinson, subject matter and nature of economics, definition and concept of agri-economics, importance and scope	4	✗		General definition and assumption of economics, Marshall's welfare definition, comparison, importance, limitations	4
Basic concepts: Goods, Utility, value and wealth, equilibrium, margin, cost, law of demand and law of supply, factors affecting demand and supply,	8	Set norms for FFS- individual farm plan,	2	Concept, interrelationship between firm, plant and industry	2
Introduction to farm management: Definition and scope, objective of farm-management, production factor and production function and its stages	5	Farm mechanization and problem, farm equipment identification	6	Concept, nature, scope, importance, problem related to farm management	3

Principals involved in farm management decisions: Principle of diminishing marginal utility, cost principle, principle of substitution, combining enterprises, equilibrium return, comparative advantage and time comparison	11	Principle of farm planning	2	Principles of diminishing return, cost, factor substitution, combining enterprises, equi-marginal return, comparative advantage, time comparison, opportunity cost principle	6
Farm inventory and records keeping: Farm records keeping, calculation depreciation, balance sheet, income statement, cash flow statement, profit-loss statement	9	Gather farm management information-farm record system, farm inventory, net-worth	4	Brief concept of balance sheet, income statement and cash flow, definition of farm inventory and process of taking farm inventory, concept and depreciation and methos of calculation	4
Farm planning, farm budgeting and designing organic farms: Principles and characteristics of farm planning techniques, enterprise budgeting, partial budgeting, complete budgeting, steps in farm planning and budgeting	9	Planning, budgeting, importance of farm planning and budgeting, methods	4	Definition, types and characteristics, farm budgeting, brief concept on budgeting, steps in farm planning and budgeting	5
Value chain analysis, concept, mapping and approaches: Value chain analysis, concept mapping and approaches, Value chain analysis of some high value commodities	10	✗		Concept of value chain, supply chain, management, definition and importance, value chain map	3

Concept of cooperatives: Definition, organization / structures, Roles of cooperative in commercial farming, cooperative laws and by-laws	8	Definition, philosophy, objectives, importance, transformation, cooperative and farming approach, types of banks-central,, commercial, industrial, development, finance, micro-finance and cooperative	8	Definition, principle, objective, marketing and importance, role of cooperative in agricultulture commercialization	3
Grade 12: Vegetable and Medicinal Plant Production	128	Subject 1: Vegetable and Vegetable seed production		Subject 1: Post harvest technology	76
Introduction: Olericulture, definition of related terminologies, importance and scope vegetables species	3	Listing of major vegetables, classification, determination, planning	4	Micro-climate and comparative advantages for year round vegetable production concept of off-season vegetable production	5
Vegetable farming: Kitchen gardening, room gardening, organic farming, off-season, peri-urban farming	5	Selection of vegetable to be grown, market analysis-demand, supply and price, location selection etc.	12	Classification, methods of sowing, major exportable spices, concepts of off-season vegetable production, classification	5
Climatic factors affecting vegetable production: Temperature, light, rainfall and humidity	3	Climatic factors (Temperature, humidity, rainfall, light, wind), role of each factors in plant growth	1		

Cultivation practices of vegetables: Cultivation of solanaceous, cole, cucurbits, bulbs, leafy, root, leguminous, asparagus and okra	27	Develop yearly calendar for major vegetables, listing, classification, determination, planning; selection of vegetables, market analysis etc.	16	types, leafy vegetable, root, legume, asparagus, okra, ginger, major spices etc.	10
Off-season vegetable production: Meaning, opportunities and problems, techniques of off-season farming, selection of crops for off-season, regulation of micro-climate, plant protection measures, use of plastic in vegetable farming, marketing of vegetable and case study	6	Improved technology for off-season vegetable production, land preparation, manuring, fertilizing, transplanting of seedlings, irrigating.	16	Concept of season and off-seasonal, principle and techniques, advantages and disadvantages	3
Medicinal plant production (MAPs): Meaning, importance, identification of wild fruits and vegetables and classification of MAPs, natural distribution, important trade and cultivation, cultivation production, industrial value and use, economic importance of unexploited MAPs as potential non-timber forest products (NTFP) based enterprise, organic farming of medicinal plants, identification of local plants of pesticidal and nutritional value	10	Importance and concept of Agro-forestry (herbal and medicinal plants)	4	Definition, key terms, history and development, importance, scope, prospects, classification, origin, therapeutic use, growth	13

Vegetable and production: Importance and status of vegetable seed production, classification of vegetables based on mode of pollination, introduction to hybrid seed production, Techniques of vegetable seed production of cabbage, tomato and radish and seed quality testing	10	Techniques for commercial vegetable production-seedling production, land preparation, planting method, irrigation	4	Importance, status, classification, isolation distance, field inspection, rouging etc.	10

Animal Science

CDC Contents	**Work Hour**	**Prediploma (Contents aligned with CDC)**	**Work Hour**	**Diploma (Contents aligned with CDC)**	**Work Hour**
Grade 9: Veterinary Extension and Computer Science	128 (64T+64P)	Subject		Subject 1: Agriculture Extension and Communication; Subject 2: ….........	

Introduction to livestock extension: Principles of extension; Historical perspectives of livestock extension development in Nepal; implified organizational structures of livestock extension systems in Nepal; Current status of livestock extension services in Nepal)	4	**Veterinary Extension and Communication** (Concept of education; Extension approaches used by DLSO; Extension teaching methods; Extension systems used in livestock sector in Nepal; Organizational structure of department of livestock services)	2	**Agriculture Extension and Communication** Meaning, concept, origin and history of extension education; Objective, area and scope of extension education; Principles of extension education; Need and importance of extension education; Historical development of agricultural extension in Nepal; Current Organizational structure of Agriculture and Livestock Development (central, provincial & local govt) agricultural Extension system and approaches used in Nepal 2.8 Present extension system used in Nepal	10

Communication and innovation, extension education systems: Types of communication, communication models and process, Organizational communication; Diffusion of innovation, adoption process and adopter categories; Extension education systems and cooperatives, audiovisual aids	6	**Veterinary Extension and Communication** Definition of communication Types of communication Role of communication in Extension Barriers in communication Line agencies coordination	8	**Agriculture Extension and Communication** **(**Communication process)	12
Extension program planning, monitoring and evaluation: 3.1 Concept and importance of program planning 3.2 Program monitoring, evaluation and follow ups 3.3 Extension program planning process and decentralization of program. 3.4 Need of evaluation of program planning	5	**Veterinary Extension and Communication** (Program planning process; Monitoring and evaluation)	1.6	**Agriculture Extension and Communication** (Program planning, monitoring and evaluation in extension)	6
Concept of sociology, social mobilization and community development: Concept of sociology and rural sociology and their importance in development process. 4.2 Concept and history of social mobilization in Nepal. 4.3 Objective of social mobilization in extension. 4.4 Concept and importance of development, Major issues and problem of rural and community development program in Nepal.	8	**Veterinary Extension and Communication** (Social mobilization, community development and gender)	4	**Social Mobilization and Community Development**	

Group formation and group dynamics: 5.1 Groups: 1.1.1 Concept, Principle and types of group. 5.1.2 Procedure of group formation and its role in extension. 5.1.3 Dynamics of group leader in group management 5.1.4 Group meeting for problem solving and decision making 5.1.5 Types of farmers' groups and its role in agriculture extension 5.1.6 Group as a conflict management	8			**Social Mobilization and Community Development** (Group formation and group dynamics)	12
Introduction and concept of Cooperative: 6.1 Introduction to cooperatives. 6.2 Impact of local cooperatives in livestock commodities	3				
Introduction to Computer: 7.1 The concepts of computer and its history 7.2 The Computer system characteristics 7.3 The Capabilities and limitation of computers. 7.5 The Generations of computers and their features; 7.6 The Types of personal computer and their characteristics. 7.4 The Types of computers	6			**Computer Application** (Introduction to Computers: 1.1 History of computers 1.2 Generation of computer 1.3 Types of computer 1.4 Computer hardware and software)	2
Computer system: Concept; hardware parts of Computer; basic components of a computer system; Memories and storage device; The Input Device; The Characteristics of monitor-Digital,	12			**Computer Application (**Hardware Components; System Software)	12

Analog, Size, Resolution, Refresh Rate, Interlaced/Non- Interlaced, Dot Pitch, Video Standard-VGA, SVGA, XGA etc. Printers and types – Impact (Dot matrix printer), Non-impact (Laser printer), Computer Software and its importance; Types of Software)					
Application of software: Conceptualize Word Processing, types and uses; Present Program Basics, Present Program's Interface, Create a Presentation Format Slides, Special Features of Presentation Programs;	12			**Computer Application (**Application Packages)	7
Grade 9: General LPM (Livestock Production and Management) and Fodder Production				Subject 1: …..........; Subject 2: ….........	
Introduction: Livestock farming in Nepal, its scope and importance; Terminologies of animal husbandry	4	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production Systems** (Role of livestock in Nepalese agricultural systems, Factors influencing the livestock production, Characterization of livestock production systems, Introductory animal husbandry)	19

Breeds ofanimals: Indigenous and exotic breeds of Cattle, buffalo, sheep, goat, pig, rabbit and poultry	12	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management, Cattle and buffalo production, Pig and poultry production)	45	**Introduction to Animal Production Systems** (Introductory animal husbandry, Breeds breed availability and their performance in Nepalese context)	7
Care and management of animals: Care and management of milking cattle and buffalo, Care and management of pregnant and lactating doe, Care and management of pregnant and lactating ewe, Care and management of pregnant and lactating gilt and sow, care of sow and gilt after farrowing, care of newly born piglets, care and management of boar and young stocks	12	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production Systems** (Approach to animals and their handling, control and identifications; Ruminants (cattle, buffalo, sheep and goat) Non-ruminants (swine, horse and rabbit) Different poultry species	6

Farm management: Introduction and importance of farm management, Major farm management practices such as disinfection, isolation, quarantine and disposal of carcass	4	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I** (General farm Management) **Agri-Economics and Farm Management (**Introduction to Farm Management, Management of farm resources, Principles Involved in Farm management decision, Farm Planning and budgeting)	6+34
Introduction to fodder production: introduction to fodder production, Terminology related to fodder production, Importance and scope of fodder production, Classification of forage crops	6	**Animal Nutrition and Fodder Production**	16	**Basics of Fodder Production and Pasture Management**	45
Cultivation practice/ Propagation nursery management: Common annual cereal fodder/forage (maize, teosinte, bajara, oat,), Common perennial fodder/forages (Napier, Para, Guinea, Seteria, Molasses, paspalum), Common annual legumes (Cowpea, Pea, Joint vetch, Berseem), Common perennial legumes (Stylosanthes, Lucerne, Forage peanut), Common fodder trees (IpilIpil, Tanki, Badahar, Kimbu, Kabhro,kutmiro, koilaro)	16	**Animal Nutrition and Fodder Production**	16	**Basics of Fodder Production and Pasture Management**	45

Pasture/ rangeland management: Importance and scope of pasture/rangeland management in Nepal, Animal feeding systems and Grazing systems in Nepal, Plant poisoning in pasture and their management, Factors affecting pasture/rangeland management	6	**Animal Nutrition and Fodder Production**	16	**Basics of Fodder Production and Pasture Management**	45
Conservation of fodder/ forages: Hay making, Silage making	4	**Animal Nutrition and Fodder Production**	16	**Basics of Fodder Production and Pasture Management**	45
Grade 9: Veterinary Anatomy and Physiology				Subject 1: …..........; Subject 2: ….........	
Introduction to anatomy: Study of external body parts of farm animals	8	**Veterinary Anatomy and Physiology**	16	**Basics of Animal Product Technology- I (**Anatomy and Physiology of Mammary gland) **Introductory Veterinary Laboratory Techniques** (Anatomy and organs of livestock and poultry) **Elementary Animal Reproduction** (Comparative anatomy of reproductive tracts of Domestic Animals)	17
Splanchnology: 2.1 Study of digestive system 2.2 Study of respiratory system 2.3 Study of urinary system 2.4 Study of reproductive system	24	**Veterinary Anatomy and Physiology** (Splanchnology)	3	**Zoology II** (Study of life process of mammals: Respiratory system)	2

Digestive system: Physiology of digestive system	16	**Veterinary Anatomy and Physiology** (Splanchnology)	3	**Introduction to Animal Production and Management - II** (Physiology of non-ruminants: Digestive system of swine, rabbit, equine, dog and cat, Mechanism of digestion in non-ruminants)	4
Reproductive system: Physiology of reproductive system	16	**Veterinary Anatomy and Physiology** (Splanchnology)	3	**Introduction to Animal Production and Management - II** (Reproductive system of swine, rabbit, equine, dog and cat, Mechanism of reproduction in non-ruminants)	3
Grade 9: Animal Health –I					
Concept of health and disease: Introduction to terminologies related to animal health, Sign of healthy and sick animal, Classification of disease	8	**Veterinary Medicine** (General Medicine)	14	**Basic Livestock Health Management - I** (Veterinary Internal Medicine)	12

Microbiology and parasitology: Definitions & terminology; Organisms causing infectious diseases: bacteria, virus, parasite and fungus; Differences between bacteria and virus; Immunity and immunization(vaccination); Common internal and external parasites, their characteristics and control measures	14	**Veterinary Laboratory Technology** (Introduction to parasitology, Introduction to internal parasites, Introduction to protozoan parasites, Introduction to External parasites)	9	**Basic Livestock Health Management - I** (General Veterinary Medicine, Veterinary Microbiology, Veterinary Parasitology)	23
Pharmacology: Introduction of pharmacology; Route of drugs/medicines administration; Antibiotics, Factors affecting dosage of drugs; Traditional livestock pharmacological practices	10	**General Veterinary Pharmacology**	16	**Basic Livestock Health Management - I** (Veterinary Pharmacology)	12
Systemic disease of livestock, parasites and disorder of different livestock species: Digestive system: stomatitis, tympany, impaction, diarrhoea and dysentery; Respiratory system,: cough and pneumonia; Circulatory system: anemia; Urinary system: nephritis and retention of urine; Reproductive system: metritis and retention of placenta; Nervous system: laminitis and GID; Skin: dermatomycosis, allergy	14	**Veterinary Medicine** (General Medicine, Internal Medicine (digestive and respiratory)	26	**Basic Livestock Health Management – II**	60

Pathology: Inflammatory status of stomach, intestine, liver, kidney, lung, heart and mammary gland	8				
First aid on surgical and gynecological cases; Wounds/injuries; Dislocation and fracture; Infertility /anoestrus; Dystocia; Prolapse; Euthanasia	10				
Grade 10: Animal Health –II				Subject 1: …...........; Subject 2: ….........	
Introduction to parasite and parasitology: Parasite and parasitology Types of parasites; Types of host	2	**Veterinary Laboratory Technology** (Introduction to parasitology, Introduction to internal parasites, Introduction to protozoan parasites, Introduction to External parasites)	9	**Basic Livestock Health Management - I** (General Veterinary Medicine, Veterinary Microbiology, Veterinary Parasitology)	23

Disease caused by external parasites: Introduction, types of external parasites, general symptoms and treatment of lice, ticks, mite, leech, fleas; Important diseases caused by external parasites	4	**Veterinary Laboratory Technology** (Introduction to parasitology, Introduction to internal parasites, Introduction to protozoan parasites, Introduction to External parasites)	9	**Basic Livestock Health Management - I** (General Veterinary Medicine, Veterinary Microbiology, Veterinary Parasitology)	23
Introduce helminth parasites: Introduce common helminth parasites of ruminants and non-ruminants; Eeffects of helminths on host; Introduction, morphology, lifecycle, diagnosis, treatment, prevention and control of: • liver fluke disease • round worm of ruminants and non-ruminants • Gid • Hydatidosis • dog tapeworm • pork tapeworm	8	**Veterinary Laboratory Technology** (Introduction to parasitology, Introduction to internal parasites, Introduction to protozoan parasites, Introduction to External parasites)	9	**Basic Livestock Health Management - I** (General Veterinary Medicine, Veterinary Microbiology, Veterinary Parasitology)	23
Protozoal diseases of livestock; Introduction, etiology, mode of transmission, symptoms, diagnosis, treatment, prevention and control: Babesiosis (Red water disease) Coccidiosis in calf	2			**Basic Livestock Health Management – II** (Protozoal diseases of livestock and poultry)	5

Bacterial diseases of livestock: Introduction, etiology, mode of transmission, symptoms, diagnosis, treatment, prevention and control: 5.1 Hemorrhagic septicemia disease 5.2 Anthrax 5.3 Black quarter 5.4 Mastitis 5.5 Brucellosis 5.6 Enterotoxaemia 5.7 Pneumonia 5.8 Tuberculosis	8	**Veterinary Medicine** (Bacterial and fungal Diseases)	12	**Basic Livestock Health Management – II** (Bacterial diseases of livestock, Bacterial diseases of poultry)	18
Viral diseases of livestock: Introduction, etiology, mode of transmission, symptoms, diagnosis, treatment, prevention and control of: 6.1 Rabies 6.2 Foot and mouth disease (FMD) 6.3 Peste des petitis ruminant (PPR) 6.4 Swine fever 6.5 canine distemper 6.6 Rinderpest 6.7 ORF	7	**Veterinary Medicine** (Major viral diseases)	12	**Basic Livestock Health Management – II** (Viral diseases of Livestock, Viral diseases of poultry)	
Fungal diseases of livestock: 7.1 Ring worm 7.2 Mycotoxicosis	2	**Veterinary Medicine** (Bacterial and fungal Diseases)	12	**Basic Livestock Health Management – II** (Fungal diseases of livestock and poultry)	5
Metabolic diseases and deficiency diseases 8.1 Milk fever 8.2 Ketosis 8.3 Vitamin and mineral deficiency diseases	6	**Veterinary Medicine** (Metabolic and Deficiency diseases)	10	**Basic Livestock Health Management – II** (Metabolic and deficiency diseases of livestock and poultry)	8

Diseases of poultry: Introduction, etiology, mode of transmission, symptoms, diagnosis, treatment, prevention and control of: i. Bacterial Disease ii. Viral Disease iii. Protozoal disease iv. Fungal Disease	13				
Vaccine and vaccination schedule: 10.1 Definition and uses of vaccine 10.2 Vaccine handling and storage 10.3 Vaccination schedule for livestock and pet 10.4 Vaccination schedule for layers for layers, broilers and breeders	4			**Basic Livestock Health Management - I** (Vaccine and vaccination, Vaccine and vaccination in poultry, basic concepts of vaccine and vaccination)	5
Public health: Introduction of zoonotic disease and awareness towards zoonotic disease.	4	**Veterinary Epidemiology and Public Health** (Important zoonotic diseases and their control)	1.2	**Basic Livestock Health Management – II** (Basic concepts of Zoonotic diseases) **Introduction to One Health, Zoonosis and Food Safety** (Impact and classification of Zoonotic diseases)	8

Introduction of artificial insemination: 12.1 Introduction, Importance and scope 12.2 Advantages and disadvantages 12.3 Insemination techniques	4	**Theriogenology and Basic Surgery** (AI concept: Introduction, history, advantages and disadvantages of AI)	0.2	**Elementary Animal Reproduction** (Artificial Insemination: Introduction to Artificial Insemination, Advantages and Disadvantages of AI, Insemination Technique: Sterilization of AI Instrument, Assimilation of AI set and Insemination) **Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)** (Artificial insemination: definition, Importance & Challenges in our context)	5
Grade 10: Veterinary laboratory technology				Subject 1: …..........; Subject 2: ….........	
Common laboratory equipment and their functions: Common laboratory equipment and their uses	14			**Introductory Veterinary Laboratory Techniques** (Common laboratory equipment and their functions)	

General laboratory procedures: 2.1 Concept, needs/importance and application of bio-safety 2.2 Bio-safety measures in laboratory 2.3 Safety and first aid in laboratory 2.4 Techniques for washing and cleaning of glassware 2.5 Sterilization 2.6 Antiseptics 2.7 Disinfectants 2.8 Storage of chemicals, reagents and vaccines 2.9 Collection, storage, labelling and dispatch of samples to laboratories	16			**Introductory Veterinary Laboratory Techniques** **(**General laboratory procedures)	5
Sample collection procedure: 3.1 Fecal sample and external parasite collection and tool for examination 3.2 Skin scrapping test 3.3 Blood sample collection methods for different species of animal 3.4 Urine sample collection 3.5 Excision of cyst, pus, abscess	16			**Introductory Veterinary Laboratory Technique** (Faecal sample collection, Faecal examination methods, Blood sample collection methods, Urine sample collection, handling and dispatch)	3
Necropsy and visceral sampling procedure: 4.1 Materials required for necropsy 4.2 Different Organ sample for different disease diagnosis 4.3 Organ to collect for bacteria identification 4.4 Milk sampling and CMT test	18				

Grade 10: Aquaculture and Fisheries	128	subject		Subject 1: ….........; Subject 2: ….........	
Introduction and scope of fish farming: 1.1 History, scope and importance of fish farming in Nepal 1.2 Terminologies related to fish farming. 1.3 Zoological classification of fish 1.4 Economic importance of fish	4	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6	**Fundamentals of Aquaculture and Fisheries**	45
Fish biodiversity in Nepal: 2.1 Indigenous fish species and their identification 2.2 Exotic fish species and their identification 2.3 External body parts of fish with function of each parts 2.4 Type of fishes kept in aquarium, 2.5 Integrated fish farming (Fish cum livestock) and its importance	8	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6	**Fundamentals of Aquaculture and Fisheries**	45
Different types of fish ponds, its construction and management: 3.1 pond survey and layout plan 3.2 Appropriate land for fish culture 3.3 Types of pond used in aqua culture 3.4 Preparation and management of fish ponds	8	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6	**Fundamentals of Aquaculture and Fisheries**	45
Feed , feeding and water quality for fish culture: 4.1 feeding habit of different fishes 4.2 feeding requirement for different stages of fish 4.3 Improved fodder grass used in feeding fish 4.4 Water quality(physical and chemical parameters) 4.5 Importance of water quality in fish	8	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)		**Fundamentals of Aquaculture and Fisheries**	45

culture					
Fish culture system: 5.1 monoculture and polyculture of fish and its importance 5.2 fingering production in paddy field 5.3 nursing methods of hatchling , fry and fingerlings 5.4 Introduce breeding of fish 5.5 Introduce types of breeding 5.6 Explain nursing methods of hatchling, fry and fingerlings	8	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6		45
Management of fish pond: 6.1 Cleaning and maintenance and use of lime in fish ponds 6.2 Preparation and management of fish pond 6.3 Use of feed and fertilizer in fish pond and its importance 6.4 Organic fertilizer 6.5 Chemical fertilizer 6.6 Pellet feed 6.7 Aquatic Weeds and its control method 6.8 Fish predators and control methods	8	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6	**Fundamentals of Aquaculture and Fisheries**	45

Common fish disease, prevention and treatment: 7.1 Fish disease caused by parasite, their treatment and control measure 7.2 Bacterial and viral disease, treatment and control	4	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6	**Fundamentals of Aquaculture and Fisheries**	45
Harvesting, marketing and preservation of fish: 8.1 stage and time of harvesting 8.2 methods of harvesting using nets: fry net, drag net, gill net, cast net, majhi jal 8.3 care and maintenance of fish nets, fishing hook 8.4 Harvesting method 8.5 Use of ice for fish transport 8.6 fish packaging method 8.7 Explain fish preservation methods: salting, smoking, freezing and canning 8.8 fish transportation and packaging method 8.9 Importance of fish marketing	8	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6	**Fundamentals of Aquaculture and Fisheries**	45
Utilization of village ponds in fish culture: 9.1 Management and utilization of old ponds 9.2 Conservation and management of Natural water bodies 9.3 Enclosure and cage culture in natural water bodies 9.4 Trout culture and production technology	8	**Animal Husbandry and Entrepreneurship Development** (Aquaculture)	6	**Fundamentals of Aquaculture and Fisheries**	45
Grade 10: Dairy Product Technology	128 (64+64)			Subject 1: …...........; Subject 2: ….........	

Dairy industry in Nepal: 1.1 History and importance of dairy sector. 1.2 Introduction of the dairy branches and scope, importance, constraints of dairy industry. 1.3 Status of production, collection, Processing and marketing of milk and milk products in Nepal 1.4 Importance of milk and milk products 1.5 Statistics of dairy animal 1.6 Major dairy industries in Nepal and their role	10				
Explain milk and its composition: 2.1 Definition of milk and colostrum 2.2 Composition and nutritive value of milk 2.3 Physical properties of milk 2.4 Factors affecting the composition of milk	8				
Dairy equipment, its cleaning and sanitization: 3.1 Equipment used in dairy farm 3.2 Equipment used in chilling center 3.3 Equipment used in dairy plants 3.4 Milk utensils on farm 3.5 Milk plant line in place 3.6 Sanitizing utensils and equipment 3.7 Chemical sanitizers 3.8 Dairy detergents, method of cleaning 3.9 Clean In Place	10				

Clean milk production: 4.1 Methods of milking: hand and machine milking 4.2 Clean milk production: concept and methods 4.3 Raw milk 4.4 Pasteurized milk 4.5 Objectives of heat treatment	6				
Milk quality and its test 5.1 Concept of milk quality 5.2 Characteristics of quality milk 5.3 Factors affecting milk quality 5.4 Quality assurance in milk collection 5.5 Organoleptic test 5.6 Alcohol test 5.7 COB test 5.8 Fat test 5.9 SNF test 5.10 Methylene blue reduction (MBR) test 5.11 Acidity test 5.12 Tests of processed milk	15				
Dairy products and processing: 6.1 Importance of milks products 6.2 Methods of preparation of 6.2.1 Butter and ghee 6.2.2 Yoghurt and lassi 6.2.3 Channa and paneer 6.2.4 Khoa, Cheese, Condensed milk 6.2.5 Milk powder 6.2.6 Ice cream and Churpi 12.3 Explain traditional sweets haluwa 1.4 Packaging, storage and distribution	15				

Grade 11: Ruminants Production and Management	128	Subject 1: ….........; Subject 2: ….........		Subjects	
Scope, limitation, importance and prospects: 1.1 Introduction to ruminants, their status and distribution 1.2 Zoological classification of ruminants 1.3 Common terminologies related to ruminants 1.4 Differentiate between ruminant and non-ruminant 1.5 Importance of ruminant farming in Nepal	7	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)**	60
Native and Exotic Breeds of ruminant: 2.1 Breed of Cattle, Buffalo, sheep, goats and their characteristic 2.2 Ruminant's biodiversity, their conservation and utilization	15	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)**	60
Farming system of ruminants: 3.1 farming system of small ruminant 3.2 farming system of large ruminant 3.3 Site selection and housing requirement of ruminants 3.5 housing system for ruminant	10	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)**	60
Routine farm operation: 4.1 Handling, transport, restraining and casting of ruminant animals 4.2 Weighing and identification 4.3 Castration, ducking, dehorning, disbudding, grooming, dentition, ageing and shearing	10	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)**	60

Care and management of different ruminant species: 5.1 Care and management of 5.1.1 Breeding male 5.1.2 Pregnant female 5.1.3 Newly born 5.1.4 Lactating female 5.1.5 Draft male 5.1.6 Diseased ruminant 5.2 Colostrumfeeding and its advantage	10	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)**	60
Record keeping: 6.1 Introduction, importance and types of record keeping	5	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)**	60
Ruminant farm economy and planning: 7.1 Planning of ruminant farm 7.2 Cost and benefit analysis of ruminant farming under different systems	7	**Animal Husbandry and Entrepreneurship Development** (Livestock production and management)	45	**Introduction to Animal Production and Management - I (Ruminants: Cattle, Buffalo, Yak, Sheep and Goat)**	60
Grade 11: Animal Nutrition	128			Subject 1: …..........; Subject 2: …..........	
Introduction to Animal Nutrition: 1.1 Introduction, scope and importance of animal nutrition 1.2 Terminologies of Animal nutrition. 1.3 situation of animal nutrition in Nepal	5	**Animal Nutrition and Fodder Production**	16	**Introductory Animal Nutrition** (Introduction: Explain the importance of Animal Nutrition, Importance of nutrients in health and reproduction, Nutritional terms and their definitions, Composition of plant and animal cells)	10

Feed stuffs: 2.1 Classification of feed stuffs 2.2 Composition of feed stuffs 2.3 Roughages and Concentrates 2.4 Feed ingredients and additives 2.5 Processing, mixing and storage of feeds	10	**Animal Nutrition and Fodder Production**	16	**Introductory Animal Nutrition** (Feedstuffs, Classification of feedstuffs, Concentrate, Energy source, Protein source, Roughages, Importance and use of unconventional feedstuffs)	8
Nutrient composition of feed stuffs and their Functions in animal body 3.1 Functions and deficiency symptoms of Water, Carbohydrates, Lipids, Proteins 3.2 Functions and deficiency symptoms of Phosphorus, Calcium, potassium, sodium, sulfur, magnesium and trace minerals 3.3 function and deficiency symptoms of Fat soluble vitamins, water soluble vitamins and the vitamins of B Complex 3.4 Use of conventional and unconventional feeds in animal feeding 3.5 Use of agro-industrial by products 3.6 Use of mineral block, molasses etc.	20	**Animal Nutrition and Fodder Production**	16	**Introductory Animal Nutrition**	45

Nutrition requirements of different stages and conditions of farm animals and birds: 4.1 Dairy cattle 4.2 Buffaloes 4.3 Goat and Sheep 4.4 Poultry 4.5 Swine	16	**Animal Nutrition and Fodder Production**	16	**Introductory Animal Nutrition**	45
Pasture/rangeland management: 5.1 Importance and scope of pasture/rangeland management in Nepal. 5.2 Animal feeding systems and Grazing systems in Nepal 5.3 Plant poisoning in pasture and their management 5.4 Factors affecting pasture/rangeland management	5	**Animal Nutrition and Fodder Production**	16	**Introductory Animal Nutrition**	45
Conservation of fodder/forages: 6.1 Hay making 6.2 Silage making 6.3 other different systems of conservation and preparation of fodder 6.4 fodder calendar for Nepal livestock production system 6.5 Storage technique of feed resources	5	**Animal Nutrition and Fodder Production**	16	**Introductory Animal Nutrition**	45
Feed Formulation,Feed Quality and Feed industry of Nepal: 7.1 Feed formulation for Ruminant, 7.2 Feed formulation for Non-Ruminant and poultry 7.3 Feed industry of Nepal	3	**Animal Nutrition and Fodder Production**	16	**Introductory Animal Nutrition**	45

Grade 11: Veterinary Pharmacology		Subjects		Subject 1: …..........; Subject 2: ….........	
Introduction 1.1 Introduction to pharmacology 1.2 Different sources of drugs and metabolites 1.3 Introduction to pharmacokinetics 1.4 Introduction to pharmacodynamics 1.5 Different terms related to pharmacology 1.6 Recent advancements in pharmacology	12	**General Veterinary Pharmacology** (Basic concepts of veterinary pharmacology)	16	**Basic Livestock Health Management - I** (Veterinary Pharmacology)	12
Routes of drug administration: 2.1 Intravenous route 2.2 Intra muscular route 2.3 Sub cutaneous route 2.4 Intra mammary route 2.5 Local, topical, enema, oral routes	10	**General Veterinary Pharmacology** (Role of veterinary drugs)	16	**Basic Livestock Health Management - I** (Veterinary Pharmacology)	12
Common antibiotics: 3.1 Defination of antibiotics 3.2 Uses of tetracycline 3.3 Uses of sulphonamides 3.4 Uses of penicillin 3.5 Uses of conciplex 3.6 Uses of ivermectin 3.7 Uses of colistin 3.8 Uses and importance of antibiotic sensitive tests	16	**General Veterinary Pharmacology**	16	**Basic Livestock Health Management - I** (Veterinary Pharmacology)	12
Anthelmentics 4.1 Defination of anthelminthics: 4.2 Uses of albendazole 4.3 Uses of benzimidazole 4.4 Uses of Piperazine 4.5 Uses of Oxyclonazide	10	**General Veterinary Pharmacology**	16	**Basic Livestock Health Management - I** (Veterinary Pharmacology)	12

Traditional medicines: 5.1 Revival of different forms of traditional medicine 5.2 Sustainable Veterinary Medicine 5.3 Importance of One Health approach 5.4 Identify and find application of popular medicinal plans around us	16	**General Veterinary Pharmacology**	16	**Basic Livestock Health Management - I** (Veterinary Pharmacology)	12
Grade 11: Commercial Poultry Farming		Subject 1: …..........; Subject 2: ….........		Introductory Poultry Production & Management	
Introduction 1.1 Historical background of poultry farming 1.2 Poultry statistics and pioneer commercial poultry raisers in Nepal 1.3 Importance, scope, problems and contribution to NGDP and AGDP 1.4 Common breeds of poultry	4			(Introductory Poultry Production & Management)	5

Care and management? 2.1 Care and management of Broiler and Layers 2.2 Care and management of Grower and Pullets 2.3 Care and management of Chicks 2.4 Process of sexing day old chicks, culling and selection of layers 2.5 Chicks transport from hatchery to farm 2.6 Brooding management 2.7 Transfer from brooder to grower to layers 2.8 Impact of poultry on environment and methods to mitigate 2.9 Vaccination and deworming in poultry 2.10 Biosecurity measures in poultry farm 2.11 Process of disinfection of poultry farms before and after arrival of chicken 2.12 Hatchery waste management 2.14 Farm waste Management	14			**Introductory Poultry Production & Management** (Hatchery Management)	6

Housing management for different categories of poultry species: 3.1 Cage vs Deep litter system and its merit and demerits 3.2 Floor space, drinker and feeder 3.3 Litter, light, ventilation management 3.4 Equipment used for commercial poultry farming 3.5 Breeder house 3.6 Layers house 3.7 Chicks/Layers house	7				
Most common disease of poultry: 4.1 Bacterial diseases 4.2 Viral diseases 4.3 Fungal diseases 4.5 Deficiency diseases	16				
Egg collection 5.1 Process of egg collection, cleaning and grading 5.2 Process of egg packaging, storage, transport and marketing 5.3 Egg selection for hatching 5.4 Incubator and its operation 5.5 Factors affecting incubation Humidity, light, temperature, turning, ventilation) 5.6 Daily record of stock/ mortality 5.7 calculate Growth and production record based on hen housed and hen day 5.8 Calculate feed consumption and conversion 5.9 Perform health record	10				

Live bird sale and disposal: 6.1 Precautions of handling live bird 6.2 Transportation of live bird 6.3 Care of bird/chicks during transport 6.4 Systems of poultry/egg marketing	5			**Introductory Poultry Production & Management** (Care and management of poultry birds)	13
Feed Formulations and feed quality: 7.1 Nutrient requirement for different age groups of broiler. 7.2 Nutrient requirement for different age groups of layers 7.3 Formulate feed for broiler and describe its quality 7.4 Formulate feed for layers and describe its quality	8				
Grade 12: Non-Ruminants Production and Management		Subject 1: …..........; Subject 2: ….........		Introduction to Animal Production and Management - II	
Introduction 1.1 Scope, Population and distribution, limitation, prospects of non-ruminants 1.2 Zoological classification of non-ruminant farm animals	5			(Introduction to non-ruminants: Introduction, importance, scope and constraints of non-ruminants production in Nepal, Zoological classification of swine, rabbit, equine, dog and cat, Difference between ruminants and non-ruminants, Terminologies related to non-ruminants)	3

Physiology of non-ruminants: 2.1 Illustrate digestive system of swine, poultry, rabbit, horse and dogs 2.2 Describe mechanism of digestion in non-ruminants 2.3 Explain sexual cycle, gestation and parturition in non-ruminants 2.4 Illustrate reproductive system of swine, poultry, rabbit, horse and dogs	8			**Introduction to Animal Production and Management - II** (Physiology of non-ruminants: Digestive system of swine, rabbit, equine, dog and cat, Mechanism of digestion in non-ruminants, Reproductive system of swine, rabbit, equine, dog and cat, Mechanism of reproduction in non-ruminants)	7
Swine production and Management: 3.1 Breeds of pig and their characteristics 3.2 Housing requirements for different age groups of pig 3.3 Nutrient requirement of swine and deficiency symptoms 3.4 Feeding different age groups of pig 3.5 Care and management of sow, boar, piglet, gilt & fatteners 3.6 Common diseases & parasites of swine and their prevention 3.7 Swine market and marketing 3.8 Farm waste management	14			**Introduction to Animal Production and Management - II** (Swine Production and management)	10

Quail, Ostrich, Turkey, Pheasant, Guinea fowl, Duck production and management: 4.1 Common breeds of Quail and their management (housing, brooding, nutrient requirement and feeding), common diseases and their prevention 4.2 Common breeds of Ostrich and their management 4.3 Common breeds of Turkey and their management 4.4 Common breeds of Pheasant and their management 4.5 Common breeds of Guinea fowl and their management 4.6 Common breeds of duck and their management 4.7 Selection of hatching eggs and incubator management	17				
Other onruminants Farming: 5.1 Common breeds of rabbit and their characters 5.2 Common breeds of equine and their characters 5.3 Common breeds of dog and their characters 5.4 Nutrient requirements and feeding of dog, horse and rabbit 5.5 Care and management of dog, horse and rabbit	12			**Introduction to Animal Production and Management - II** (Rabbit production and management)	

Non-ruminants farm Operations: 6.1 Ear notching, castration and removal of needle teeth in swine 6.2 Culling, debeaking and light management in fowl 6.3 Restraining of non-ruminants 6.4 Breeding plan to avoid unwanted pregnancies & in-breeding	8				
Grade 12: Meat Science and Technology		Subject 1: ….........; Subject 2: ….........		Subjects	
Introduction 1.1 scope, Situation and problem of meat sector in Nepal 1.2 Per capita consumption and production 1.3 Meat and meat product processor in Nepal	3				
Process of Slaughtering animal: 2.1 Pre-slaughter care and handling 2.2 Transportation and delivery 2.3 Care in lairage 2.4 Methods of stunning 2.5 Methods of slaughtering 2.6 Ante mortem and post mortem inspection	8				
Composition and physic-chemical properties of meat and meat quality: 3.1 Definition of meat and its composition 3.2 Physic-chemical properties of meat 3.3 Nutritive value of meat and meat products 3.4 Meat quality	17				

Meat product, By products and their uses and microbiology of meat: 4.1 Meat Product(Meat balls and rolls,Sausage, Bacon, Ham) 4.2 Meat byproduct 4.3 Local delicacies of meat 4.4 Edible and inedible meat of dressed carcass 4.5 Common microbes in fresh meat, meat products 4.6 microbes in processing 4.7 Sources of contaminants and methods of reducing contamination	16				
Processing, Handling and preservation method: 5.1 Processing techniques 5.2 Handling of carcass 5.3 Preservation Methods	16				
Abattoir and slaughter slab: 6.1 Design 6.2 Construction 6.3 Factors of consideration	4				
Grade 12: Genetics and Animal Breeding	128	Subject 1: …...........; Subject 2: ….........		Subjects	

Introduction 1.1 Terms and definition 1.2 History of animal breeding in Nepal 1.3 Importance of breeding management	5	**Animal Husbandry and Entrepreneurship Development** (Genetics and animal breeding)	5	**Introductory Genetics and Animal Breeding** (Introduction: Importance of animal breeding in livestock improvement in Nepal, History of animal breeding and breeding activities and institutions in Nepal, Common terminologies in genetics and animal breeding)	4
Principles of selection 2.1 Natural and artificial selection 2.2 Basis of selection 2.3 Methods of selection	12	**Animal Husbandry and Entrepreneurship Development** (Methods of selection)	0.8	**Introductory Genetics and Animal Breeding** (Principles of selection: Importance and basic principles of selection, Basis of selection, Methods of selection)	5
Livestock breeding systems and breeding strategies: 3.1 Random mating system 3.2 Assortative mating system 3.3 Inbreeding 3.4 Out breeding 3.5 Breeding strategies/plan for cattle, buffalo, sheep, goat, swine and poultry in Nepal	18	**Animal Husbandry and Entrepreneurship Development** (Systems of animal breeding)	0.8	**Introductory Genetics and Animal Breeding** (Breeding Strategies: Define breeding goal and objectives and their basis, Open Nucleus and Close nucleus Breeding Systems, Formulation of Breeding Plans for Different Livestock Species, Community Breeding Systems)	9

Introduction to Reproductive physiology and breeding behavior of different farm animal: 4.1 Puberty and sexual maturity 4.2 Factors affecting puberty and sexual maturity 4.3 Spermatogenesis and oogenesis 4.4 Control mechanism of reproduction (neuro-endocrinal) 4.5 Estrus cycle, ovulation and fertilization 4.6 Gestation and parturition 4.7 Breeding behavior of cattle and buffalo, sheep and goat, pig	15			**Elementary Animal Reproduction**	45
Heat detection and synchronization: 5.1 Induction and synchronization of ovulation/ estrus 5.2 Advantages and disadvantages of estrus synchronization 5.3 Heat detection and pregnancy diagnosis	6				

Semen collection, processing and Artificial insemination (AI): 6.1 Methods of semen collection 6.2 Evaluation and examination of semen quality 6.3 Dilution, preservation, transportation, handling and distribution of semen 6.4 Introduction to AI 6.5 Techniques of AI 6.5.1 Vaginal speculum method 6.5.2 Per rectal method 6.6 Time of insemination 6.7 Advantages and disadvantages of AI	8	**Theriogenology and Basic Surgery** (AI concept: Introduction, history, advantages and disadvantages of AI)	0.2	**Elementary Animal Reproduction**	45
Grade 12: General Surgery and Radiology	128	Subject 1: …..........; Subject 2: …..........		Subjects	

General surgery 1.1 Introduction to surgery and life-saving interventions 1.2 Principles of pre and post-surgical asepsis 1.3 Instruments necessary for minor surgeries including the types of suture materials 1.4 Suture patterns, their choice with relative advantages and disadvantages 1.5 Concept and management of trauma,wound, burns and scalds, tumors, inflammation, cyst, suppuration and abscess, necrosis, gangrene, ulcers, sinuses and fistula 1.6 Need, methods of sterilization for various instruments, site and disinfection of the operation area 1.7 Different musculoskeletal complications, differentiate and identify, sprains, fractures and their stabilization 1.8 Handling of dislocation 1.9 Anatomical and physiological position of the surgical site	20	**Theriogenology and Basic Surgery** (Veterinary surgery)	3	**Basic Livestock Health Management - I** (Veterinary Surgery)	4

Operative surgery 2.1 Surgical instruments and their uses in surgery 2.2 Care and handling of surgical equipment. 2.3 Importance of preparation of the surgery room, surgeon and patient 2.4 Introduction to anesthesia and anesthetics 2.5 Pre-operative preparation of patients 2.6 Post-operative care of patients 2.7 Pain management 2.8 Introduction to fluid therapy, its importance and techniques of fluid therapy in surgical patient 2.9 Introduction toblood transfusion, its importance and techniques of blood transfusion 2.10 Nutritional management of the surgical patients 2.11 Surgical infection and its prevention 2.12 Disbudding and explain its process	20				

Rescue and First aid: 3.1 Ways to rescue and administer first aid and their importance 3.2 Best approach in handling and transporting injured animals and issues related to welfare 3.3 General examination of an injured animal and prioritize treatment 3.4 Administer suitable first aid to an animal suffering from poisoning, fracture, wound, sting and bites 3.5 Administration of effective and appropriate first aid to animal with open cuts and hemorrhage 3.6 Administration of first aid in other emergency situations	12	**Theriogenology and Basic Surgery** (Veterinary surgery)	3		

Radiology 4.1 Historical back ground, scope and development of veterinary radiology 4.2 Basic working principles of X-rays and dangers of their improper uses 4.3 Factors influencing quality of X-rays imaging and management of dark room 4.4 Contrast radiography- classification, materials used, indication and contra indication 4.5 Biological effects of radiation, radiation hazards and their preventive measures 4.6 Anatomical position used in radiology and terminologies use in request prescriptions 4.7 Ultrasonography and list out its uses, preparation for proper imaging 4.8 Physical therapy, its classification, scope and limitation	12	**Theriogenology and Basic Surgery** (Basic Veterinary Radiology)	2		

Computer Engineering

Technical Stream Contents	Work Hour	Prediploma	Work Hour	Diploma	Work Hour
Grade 9: (Subject 1) Programming principal & concept in C Language	128 hrs	Subject 1:Computer Programming Subject 2: ….........	115 hrs (28 hrs + 87 hrs)	Subject 1: C Programming	105 hrs
Principles of Pro-gramming (Introduction; categories; applications; program design tools)	6 hrs +2 hrs	×		Program Errors, Types of Error (Syntax Semantic, Runtime Error)	6 hrs
Fundamentals of C (Introduction; Basic Program Structure; Variables and Keywords; Character Sets, Constants and Variables 2.5 Data Types and Format Specifiers 2.6 Input/ Output statements 2.7 Operators in C)	10 hrs + 3 hrs	Module 1: Programing in C	3 hrs + 3 hrs	Formatted and Unformatted input/output functions; Types of Operators: Unary, Binary, Ternary operators	12 hrs
Control Flow Statements (Decision Making Statements ; Demonstration of if, if else,else if…else statement and switch statement and their conditions; Describe loop statements; Demonstrate for loop; while loop; Do-while loop and Nested loop;Illustrate jump statement; break, continue, goto and return statement with its conditions)	16 hrs +15 hrs	×		if...else if...else statement; Nested if...else statement;	12 hrs

Functions (Introduction; declaration of a function, defining of a function. ; calling of a function;types of functions;Library function vs User Defined function;function call (Call by value , Call by reference);concept of recursive functions)	12 hrs + 15 hrs	×		Category of function according to return value and agruments.	6 hrs
Arrays & Strings (Introduction; features of arrays;One dimensional Array;usage of gets() and puts() functions;string functions strlen() , strcpy(), strcat(), strcmp(),strrev(), strlwr(), strupr())	10 hrs + 15 hrs	×		Types of Arrays: 1-D Array, Multi-dimensionial Array	8 hrs
Structure and Union (Introduction;declaration of structure and structure variable;member access of structure& union;declaration of union and union variable;Differentiate between structure and union)	6 hrs +7 hrs	×		Array of Structure; Nested Structure; Structure Vs. Union;	6 hrs
Pointers (Introduction;declaration of pointer and pointer variable;concept of Referencing and Dereferencing)	4 hrs + 7 hrs	×		Address(&) and indirection(*) operator; Pointer Arithmetic operators	4 hrs
				Extra Contents	

				Data Files: Introduction to Data files; types of data files (text file, binary file); File handling operation; opening and closing file; creating file; Library function for reading from a fileand writing to a file (fputs, fgets, fputc, fgetc, fprintf, fscanf)	6 hrs
Grade 9: Fundamentals of Computer and Application	128 hrs	Subject 1: Fundamental of Information Technology Subject 2: ….........	234 hrs (70+164)	Subject 1: Computer Application	
Introduction to computer (Theory+ Practical)	8 hrs + 10 hrs	Module 1: Work in Microsoft Window program.	36 hrs +42 hrs	History of computer; Generation of computer; Hardware vs Software	2 hrs
Computer Components (Theory+ Practical)	10 hrs+ 10 hrs	Module 2: Operate Word Processing Program	10 hrs +40 hrs	✔	

Computer software (Theory+ Practical)	10 hrs + 8 hrs	Module 3: Work in MS EXCEL Program	10 hrs +40 hrs	MS-DOS system files: io.sys, msdos.sys, command.com, config.sys, autoexec.bat; MS-DOS Internal and External commands	6 hrs
Memory/Storage Unit (Theory+ Practical)	10 hrs + 6 hrs	Module 5: Work in Email and Internet Browse Program	8 hrs + 20 hrs	✓	included in unit 2
Internet and its Application (Theory+ Practical)	10 hrs + 12 hrs	✓		Brief introduction to LAN, MAN, WAN; Topologies: Bus, Ring and Star; Hub Switch, Modem; Network Cabling, NIC, Network OS, client and server concept, File and print sharing	7 hrs
Multimedia (Theory+ Practical)	8 hrs + 8 hrs	Module 1: Assemble & repair Computer Hardware : Operate multimedia (projector, digital camera, audio-video)	1 hrs + 4 hrs	✓	
Emerging Technology (Theory+ Practical)	8 hrs + 10 hrs	✓		✗	
		Extra Contents		Extra Contents	

				Utility Program: Computer Virus and its removal (antivirus programs)	included in unit 6
Grade 9: Fundamentals of electro-system	128 hrs	Subject 1: ………….; Subject 2: …………		Subject 1: Basic Electrical and Electronics Engineering;	
Introduction to Electrostatics (Theory+ Practical)	9 hrs + 6 hrs	×			
Electric Fundamentals (Theory+ Practical)	13 hrs + 6 hrs	×			
Electric circuit	13 hrs + 12 hrs	×			
Electrical Power and Theory (Theory+ Practical)	6 hrs + 8 hrs	×			
Cell and capacitor (Theory+ Practical)	10 hrs + 12 hrs	×			
Magnetism and Electromagnetism (Theory+ Practical)	8 hrs + 8 hrs	×			
Fundamentals of Current and phase current (Theory+ Practical)	5 hrs+ 12 hrs	×			
Grade 9: Website Design	128 hrs	Subject 1: Graphic & Web Development Subject 2: …………	234 hours (57 hrs + 57 hrs)	Subject 1: Web Technology-I	
Basics in Website Design (Theory+ Practical)	6 hrs + 2 hrs	×		✓	5 hrs
Website Design Prin ciples (Theory+ Practical)	4 hrs + 2 hrs	×		✗	

HTML Basics (Theory+ Practical)	6 hrs + 2 hrs	Module 4: Design Webs	10 hrs + 25 hrs	✓	15 hrs
HTML Elements (Theory+ Practical)	15 hrs + 14 hrs	✓	2 hrs + 4 hrs	✓	include in unit 2
HTML5 Basics (Theory+ Practical)	5 hrs + 4 hrs	✓		✓	5 hrs
Cascading Style Sheets (CSS) (Theory+ Practical)	18 hrs + 20 hrs	✓	2 hrs + 3 hrs	Responsive web design; <div> tags	5 hrs
JavaScript Funda mentals (Theory+ Practical)	10 hrs + 20 hrs	×		JavaScript functions; event handling and javaScript objects;Form validation;	8 hrs
Grade 10: Data structure & OOP concept using C++	128 hrs	Subject 1: ………....; Subject 2: ………...		Subject 1:Data Structure and Algorithm .; Subject 2: Object Oriented Programming in Java	
Basic Introduction to Data Structure (Theory+ Practical)	20 hrs + 20 hrs	×		Units 1 to 8 (Full alignment)	44hrs
Concept Of Object Oriented Program ming (OOP) using C++ (Theory+ Practical)	10 hrs + 20 hrs	×		✓	3 hrs
Class and Object (Theory+ Practical)	7 hrs + 20 hrs	×		Units 2, 3, 5, 6, 7, 8 (via class-based implementation)	30 hrs
Abstraction and En capsulation (Theory+ Practical)	7 hrs + 4 hrs	×		✓	Not aligned

Inheritance (Theory+ Practical)	10 hrs + 20 hrs	×		✓	8 hrs
Polymorphism (Theory+ Practical)	10 hrs + 0 hrs	×		✓	Not aligned
		Extra Contents		Extra Contents	
				Unit 6: Interface and package	8 hrs
				Unit 7: Exceptiong Handling	6 hrs
				Unit 8: Multithreading	6 hrs
				Unit 9: I/O	7 hrs
Grade 10: Computer Hardware, Electronics Repair and Maintenance	128 hrs	Subject 1: Computer Hardware &Networking Subject 2: …………	234 hrs (44 hrs+190 hrs)	Subject 1: …………; Subject 2: …………	
Introduction to Electronic Devices (Theory+ Practical)	10 hrs + 4 hrs	Module 1: Assemble & repair Computer Hardware : Identify the computer components:	3 hrs +15 hrs	Not aligned	
Introduction to Computer System (Theory+ Practical)	10 hrs + 6 hrs	Module 1: Assemble & repair Computer Hardware : Introduction to Computer Systems	1 hrs	Included on computer application subject	aligned with diploma course
Overview on System's Core (Theory+ Practical)	12 hrs + 14 hrs	×		✓	aligned with diploma course
Troubleshooting Techniques (Theory+ Practical)	12hrs + 14hrs	Module 1: Assemble & repair Computer Hardware: Troubleshoot computer system faults	2 hrs + 10 hrs	✓	aligned with diploma course

Repair and Maintenance (Theory+ Practical)	12 hrs + 16 hrs	×		✔	aligned with diploma course
Backup and Recovery (Theory+ Practical)	8 hrs + 10 hrs	×		✔	8 hrs
Grade 10: Database Management System	128 hrs	Subject 1: Database Management System Subject 2: …………	234 hrs (62 hrs + 172 hrs)	Subject 1: Database Management System; Subject 2: …………	
Introduction to Database System (Theory+ Practical)	6 hrs + 4 hrs	Module 1: Familiarize with Database Management System.	3 hrs	✔	5 hrs
Entity Relationship Model (ER- Model) (Theory+ Practical)	10 hrs + 10 hrs	×		✔	8 hrs
Relational Model (Theory+ Practical)	10 hrs + 10 hrs	×		✔	include in unit 2
SQL (Structured Query Language) Overview (Theory+ Practical)	14 hrs + 25 hrs	Module 3: Perform in Structured Query Language (SQL) Program	21 hrs + 95 hrs	✔	8 hrs
Relational Database Design (Theory+ Practical)	8 hrs + 10 hrs	×		✔	8 hrs
Database Transaction (Theory+ Practical)	8 hrs + 0 hrs	×		✔	6 hrs
Database Backup Recovery, and Security (Theory+ Practical)	8 hrs + 5 hrs	×		✔	6 hrs
		Extra Contents		Extra Contents	
				Unit 5: Query proessing	6 hrs

				Unit 4: Relational Language & query processing	8 hrs
Grade 10: Digital Design and Microprocessor	128 hrs	Subject 1: …..........; Subject 2: ….........		Subject 1: Digital Logic; Subject 2: Microprocessor and Computer Architecture	
Number system and Binary arithmetic operations (Theory+ Practical)	12 hrs + 0 hrs	×		✓	4 hrs
Concept of logic gates	14 hrs + 0 hrs	×		✓	10 hrs
Boolean algebra and Karnaugh Map (Theory+ Practical)	10 hrs + 0 hrs	×		✓	5 hrs
Binary arithmetic and Combinational Logic (Theory+ Practical)	13 hrs + 0 hrs	×		✓	8 hrs
Introduction to Microprocessor and its components (Theory+ Practical)	15 hrs + 0 hrs	×			
		Extra Contents		Extra Contents	
				Unit 1: Introduction to Digital Signal	3 hrs
				Unit 7: Sequential Logic Circuits	8 hrs
Grade 11: Programming in JAVA (Th+P)	128 hrs	Subject 1: …..........; Subject 2: ….........		Subject 1:Object-Oriented Programming in Java .; Subject 2:	

				…………	
1 . JAVA Fundamentals	11 hrs + 14 hrs			unit 1: Object-Oriented Programming, unit 2: Introduction to Java	2hrs + 3hrs
2 Data types and Variables	10 hrs	×		unit 3: Data Types and Conversion, Variables and Constants	3hrs
3 Class and Object	8 hrs + 8 hrs	×		unit 4: Classes and Objects	10 hrs
4 Control Statements	12 hrs + 15 hrs	×		Unit 3: 3.7 Control Structures, 3.8 Loop	2hrs
5 Arrays	8 hrs + 6 hrs	×		Unit 3: 3.10 Arrays	1hr
6 String	10 hrs + 10 hrs	×			
7 I/O and Java Applets	5 hrs + 5 hrs	×		Unit 9. I/O	7hrs
8. OOP Concept (only practical)	6 hrs	×		unit 1: Object-Oriented Programming	3hrs
		Extra Contents		Extra Contents	
				Unit 5. Inheritance	

				Unit 7. Exception Handling	
Grade 11: Computer Organization and Architecture	128 hrs	Subject 1:Fundamental of Information Technology Subject 2: ….........	234 hrs (70 hrs + 164 hrs)	Subject 1:Microprocessor and Computer Architecture .; Subject 2: ….........	
1 . Introduction to computer	10 hrs + 16 hrs	Module 1: Work in Microsoft Window program	36 hrs + 42 hrs	unit 4: History of Computer Architecture, Overview of Computer Organization	1 hr
2 . Data Representation	6 hrs	Module 3: Work in MS EXCEL Program	10 hrs + 40 hrs	Unit 6: Computer Arithmetic; 6.1 Data Representation	1hr
3 . Instruction format	10 hrs	×		Unit 3: Machine Language Instruction Format,	1hr
4 . Memory	12 hrs + 26 hrs	×		unit 4: Memory Hierarchy and Cache, Memory Hierarchy and Cache, Indirect Addressing	2hrs
5 . Processor	14 hrs + 12 hrs	Module 2: Operate Word Processing Program	10 hrs + 40 hrs	Unit 1. Introduction of Microprocessor	8hrs
6. Input/ Output Organization	12 hrs + 10 hrs	×		Unit 7. Input Output Organization;	3hrs

				input-Output Interface	
		Extra Contents		Extra Contents	
				Unit 2: Instruction cycle and timing diagram	3 hrs
				Unit 3: 8085 instruction set	12 hrs
				Unit 6: Computer Arithmetic	3 hrs
Grade 11: Operating System	128 hrs	Subject 1: Computer Hardware &Networking ; Subject 2: ….........		Subject 1: Operating System .; Subject 2: ….........	
1 . Introduction to Operating System	12 hrs + 26 hrs	Module 1: Assemble & repair Computer Hardware : Install Operating system	2 hrs + 10 hrs	Unit 1. Introduction	6hrs
2 .Process and process scheduling	15 hrs + 8 hrs	×		Unit 2. Process Management	10 hrs
3 . Memory Management	10 hrs + 10 hrs	×		Unit 3. Memory Management	10hrs
4 . Deadlock Management	10 hrs + 4 hrs	×		Unit 4. Deadlock Management	8 hrs
5 .Concept of File Management	7 hrs	×		Unit 5: File Concepts, Access, Directory Systems; File System Layout;	4 hrs

				Allocation Strategies, Inodes	
6. Linux	10 hrs + 16 hrs	Module 2: Perform Computer Networking:- Provide OS networking services	1 hr + 1 hr	×	
		Extra Contents		Extra Contents	
				Unit 6. Security	
				Principle of I/O Hardware and Software	
				Disk Formatting, Disk Arm Scheduling, Stable Storage, Error Handling	
Grade 11:Web & Mobile Application Development	128 hrs	Subject 1: Graphic & Web Development ; Subject 2: ….........	234 hrs (57 hrs + 177 hrs)	Subject 1: …..........; Subject 2: ….........	
1 . Introduction to mobile applications	8 hrs + 8 hrs	×		×	
2 .Mobile Operating Systems scheduling	12 hrs + 8 hrs	×		×	
3 . Android	12 hrs + 10 hrs	×		×	

4 .IOS	12 hrs + 10 hrs	×		×	
5 . Web applications	10 hrs + 7 hrs	Module 4: Design Webs : 4.2: Work in Dreamweaver Program :- Introduction to webpage	1 hrs + 5 hrs	×	
6. Web application life cycle models	10 hrs + 6 hrs	×		×	
7. Project work : Develop a simple mobile application for school purpose with database	15 hrs	×		×	
Grade 12: Visual Programming	128 hrs	Subject 1: Computer Programming.; Subject 2: …………		Subject 1: …………; Subject 2: …………	
1.Introduction to C#.NET	10 hrs + 16n hrs	Module 1: Task 2, Module 2: Task 1, Task 2	9 hrs 7 hrs	×	
2. Control statements	10 hrs + 12 hrs	Module 1: Task 5, Module 2: Task 3	12 hrs + 22 hrs	×	
3.Arrays	8 hrs + 10 hrs	Module 1: Task 6, Module 2: Task 3	7 hrs + 6 hrs	×	
4. Strings	8 hrs + 5 hrs	Module 1: Task 8, Module 2: Task 3	5 hrs + 6 hrs	×	
5 . Structures	10 hrs + 8 hrs	Module 1:Task 10: Define structures	5 hrs	×	
6. Pointers	10 hrs + 8 hrs	Module 1: ask 9: Define pointer	5 hrs	×	
7 . Working with database	8 hrs + 5 hrs	Module 2: Task 7 and Task 8	21 hrs + 15 hrs	×	
		Extra Contents		Extra Contents	
		Graphics (simple graphics functions)			
		Working with Forms and			

		Toolbox Controls			
		Graphics Programming			
Grade 12: Computer Network	128 hrs	Subject 1: Computer Hardware &Networking .; Subject 2: ….........		Subject 1:Data Communication and Computer Network.; Subject 2: ….........	
1.Introduction to computer Network	4 hrs + 6n hrs	module 2: familiarize with computer Networking	2 hrs	Unit 1	4 hrs
2.Network Types and topologies	10 hrs + 8 hrs	module 2: familiarize with computer Networking , familiarize with topology and transmission media	2hrs + 5hrs	Unit 2	2 hrs
3.Network Devices and Transmission media	10 hrs + 12 hrs	module 2: familiarize with topology and transmission media , Install & configure devices, Perform Network Wiring, Connect Network Cables, Repair Network Devices	51 hrs	Unit 2 and 3	4 hrs
4. Network Architecture	8 hrs + 14 hrs	Module 2 : Familiarize with Computer Networking	2hrs	Unit 2, Unit 5	4 hrs
5 . Reference model and IP Addressing	14 hrs + 10 hrs	Module 2: Familiarize with OSI Reference Model, Familiarize with Network Protocols	4hrs+ 6hrs	Unit 2, Unit 6,	6 hrs

6. Workgroup Computing	6 hrs	Module 2: Configure Windows Networking Services, Configure Printing System in Networking Services	11hrs+ 6hrs	Unit 2, Unit 7, unit 8	6 hrs
7 . Network Security	12 hrs + 14 hrs	Module 2: Manage Networking Security Services, Repair Network Devices	12hrs+6hrs	Unit 9	4 hrs
Grade 12: Contemporary technology	128 hrs	Subject 1: …..........; Subject 2: ….........		Subject 1:Internet of Things .; Subject 2: ….........	
1.Introduction to contemporary technology Network	10 hrs + 4 hrs	✗		Unit 1. Introduction	6 hrs
2.E-Commerce	8 hrs + 12 hrs	✗		Unit 6: Applications & Asset Management, Industrial Automation, Commercial Automation	2 hrs
3.E-governance	8 hrs + 8 hrs	✗		✗	
4. Cloud Computing and Internet of Things (IOT)	14 hrs + 12 hrs	✗		✗	
5 . AI	10 hrs + 10 hrs	✗		✗	

6. Multimedia	6 hrs + 10 hrs	✗		✗	
7 . Big Data	8 hrs + 8 hrs	✗		✗	
Grade 12: Software engineering and project	128 hrs	Subject 1: System Analysis & Design; Subject 2: …………		Subject 1: Software Engineering .; Subject 2: …………	
1.Introduction to Software Engineering technology Network	8 hrs + 2 hrs	module 1: identify system analysis and design , familiarize with system development and flow , prepare major system development models	6hrs	Unit 1. Introduction	4 hrs
2. Project management techniques	8 hrs + 4 hrs	module2: plan / Control activities , manage analysis / design activities	4hrs	Unit 3. Software Project Management	7 hrs
3.Software Development Phases	14 hrs + 12 hrs	module 1: Familiarize with system development and flow,module 2: Problem identification, opportunity analysis, feasibility study, module6: System testing and maintenance	4½ hrs+ 7 hrs	Unit 4: Software Requirement Analysis & Specification; Unit 5: Software Design; Unit 9: Software Maintenance	15 hrs
4. Software Development life cycle Models	8 hrs	Module 1: prepare major system development models , familiarize with system development and flow	2 hrs + 3 hrs	Unit 2. Software Development Life Cycle Models	7 hrs

5 . Software Analysis and Design Tools	10 hrs + 12 hrs	module 4: Analyze /Process data	7hrs + 12hrs	Unit 4: Data flow diagram, Data dictionary, Entity-Relationship diagram; Unit 5. Software Design	8 hrs
6. Project Work	16 hrs + 30 hrs	module 7: Perform Project work	5hrs +5hrs	✗	

Civil Engineering

Technical Stream Contents	**Work Hour**	**Prediploma**	**Work Hour**	**Diploma**	**Work Hour**
Grade 9: Computer and Drawing		Subject 1:Computer Aided Drafting; Subject 2: Engineering Drawing		Subject 1: Computer Application; Subject 2: Engineering Drawing	
Introduction to computer: (Conepts and hsitory, characteristics,capabilities and limitations, generatiion and types, Computer works)	128			hsitory,generatiion and types	2

computer components (Basic, processing,Input device ; keyboard, mouse, joystick, OMR, OCR, BCR, MICR, Scanner, Touch screen, Touch pad, micro phone, digital camera, Output device; monitor, speaker, printer, projector, headphone,Memory units; primary & secondary			1	computer components (Basic, processing,Input device ; keyboard, mouse, joystick, OMR, OCR, BCR, MICR, Scanner, Touch screen, Touch pad, micro phone, digital camera, Output device; monitor, speaker, printer, projector, headphone,Memory units; primary & secondary	6
Operating system (Introduction, Type-Batch, Single, Multi programming, Multi processing, Multi tasking, Multi processing, Timesharing, Real time,Windows Operating System Introduction to GUI and its feature Working with a Window Environment and Window Application Program , Open Sources Operating System Introduction of Open Sources Operating System Introduction to Linux, UNIX)				Windows Operating System Introduction to GUI and its feature Working with a Window Environment,Open Sources Operating System Introduction of Open Sources Operating System Introduction to Linux, UNIX)	6
Multimedia (Introduction, Components, Text ,Audio ,Video, Animation, Application)					

Networks and internet (Introduction, Type of network: LAN, MAN, WAN, and Internet (Introduction Only),Use of internet)				Networks and internet (Introduction, Type of network: LAN, MAN, WAN, and Internet (Introduction Only),Use of internet)	7
Introduction of drawing (Types of drawing ,Engineering drawing,drawing materials ,drawing tools)		Windows Operating System Introduction to GUI and its feature Working with a Window Environment and Window Application Program; Open Sources Operating System Introduction of Open Sources Operating System Introduction to Linux, UNIX	5	Introduction of drawing (Types of drawing ,Engineering drawing,drawing materials ,drawing tools)	2
Introduction of line and gemoetrical shape (Definition of line and its type, line weight and their uses,Introduction of geometrical shape like rectangle, square triangle parallelogram, rhombus and polygon, Circle and its parts name)		Line,geometry shape,rectangle,polygon, circle , parallelogram,rhombus	2.5		
Scale (Knowledge ,Full, Reduced, Enlarge, construction, Practicing the drawing of various length line using the scale)		enlarge and reduced	15	Scale (Knowledge ,Full, Reduced, Enlarge, construction, Practicing the drawing of various length line using the scale)	1.5

Lettering (Introduction of single and double stroke letter ,Vertical and inclined letter, Height and width ratio , Practice of letter writing of upper case and lower case , Practice of Devanagari)		Single stroke	3.5	Lettering (Introduction of single and double stroke letter ,Vertical and inclined letter, Height and width ratio , Practice of letter writing of upper case and lower case , Practice of Devanagari)	4
Dimensioning (Dimension system ,Chain and size, Dimension and extension line placement of dimension text, Uses of arrow head, dot and slash)		arrow head, extension line,	2.5	Dimensioning (Dimension system ,Chain and size, Dimension and extension line placement of dimension text, Uses of arrow head, dot and slash)	1.5

Geometrical construction (Know about the geometrical shape and their name, Construction of 90-, 60-degree angle and given angles, triangles by given side,rectangle, square, pentagon hexagon, Heptagon ,Bisection and trisection of line and angle,Line dividing in any number of equal parts ,Circle- dividing five, six,, seven and eight equal parts,Line tangent to a circle from any poin, Uncrossed (open belt) and crossed (crossed belt) line tangent, Arc tangent (Internal, external and combined))		Geometrial construction, triangle,rectangle,square,pentagon,hexagon,bisection,tangent	13.5	Geometrical construction (Know about the geometrical shape and their name, Construction of 90-, 60-degree angle and given angles, triangles by given side,rectangle, square, pentagon hexagon, Heptagon ,Bisection and trisection of line and angle,Line dividing in any number of equal parts ,Circle- dividing five, six,, seven and eight equal parts,Line tangent to a circle from any poin, Uncrossed (open belt) and crossed (crossed belt) line tangent, Arc tangent (Internal, external and combined))	2
Draw curves (Introduction & Types, Line and circular involutes, cycloid, Hellices)		Draw curves (Introduction & Types, Line and circular involutes, cycloid, Hellices)	1.5	Draw curves (Introduction & Types, Line and circular involutes, cycloid, Hellices)	1
Draw parabola and Ellipse (Introduction of cone and its terminology and various shapes, Ellipse, Parabola)		Ellipse,Parabola,	1	Draw parabola and Ellipse (Introduction of cone and its terminology and various shapes, Ellipse, Parabola)	1

Orthographic projection (Theory, Introduction principal,Introduction of first and third angle, Projection of point(s) and line(s) in first angle projection, Projection of line: Parallel to HP, parallel to VP and perpendicular to HP and VP. Inclined to HP and VP, Orthographic projection of prism, cylinder, pyramid and cone, different models)		Orthographic projection (Theory, Introduction principal,Introduction of first and third angle, Projection of point(s) and line(s) in first angle projection, Projection of line: Parallel to HP, parallel to VP and perpendicular to HP and VP. Inclined to HP and VP, Orthographic projection of prism, cylinder, pyramid and cone, different models	5	Orthographic projection (Theory, Introduction principal,Introduction of first and third angle, Projection of point(s) and line(s) in first angle projection, Projection of line: Parallel to HP, parallel to VP and perpendicular to HP and VP. Inclined to HP and VP, Orthographic projection of prism, cylinder, pyramid and cone, different models)	2.5
Draw isometric views (Isometric projection, Scale,Process of preparation , Free hand sketch)		(Isometric projection, Scale,Process of preparation , Free hand sketch	5	Draw isometric views (Isometric projection, Scale,Process of preparation , Free hand sketch)	0.5
Section (Need and importance, Different types, Practicing of sectional view of simple object)				Section (Need and importance, Different types, Practicing of sectional view of simple object)	0.5
Surface development (Introduction,Method,)		both in bracket			
Land measurement symbol (triangulation method ,Unit of length/Unit of land Ropani/Bigha/Hectare,General symbol of civil, domestic electrical (fixtures) works and plumbing works)					

Grade 9 : Water supply and sanitary engineering		Subject 1: Water Supply, Sanitary and Irrigation Engineering.; Subject 2: ….........		Subject 1:Water Supply Engineering; Subject 2: ….........	
Introduction (Importance of water to life and our environment, water and sanitation, Objectives,Community mobilization for construction and maintenance of water supply)	156			Introduction (Importance of water	
Sources of water (Define,Surface water, Ground water ,selection criteria,Discharge measurement, protection plan,Numerical practice,)		Sources of water (Define,Surface water, Ground water ,selection criteria,Discharge measurement, protection plan,Numerical practice,)	6	Sources of water (Define,Surface water, Ground water ,selection criteria,Discharge measurement, protection plan,Numerical practice,)	6
Demand of water (Types, Demand, Factors,Population forecast, calculation)		Demand of water (Types, Demand, Factors,Population forecast, calculation)	4	Demand of water (Types, Demand, Factors,Population forecast, calculation)	6
Quality of water (Characteristics ,Water pollutants and their effects on health,Diseases related to water; their causes and prevention,Water-borne diseases, washed ,Transmission routes, Preventive measures, quality standards (WHO, GoN),Physical analysis (temperature, color, turbidity, taste and odour),Chemical analysis)		their causes and prevention,Water-borne diseases, washed ,Transmission routes, Preventive measures,	4	Water pollutants,Water-borne diseases,quality standards (WHO, GoN),Physical analysis (temperature, color, turbidity, washed ,Transmission routes, Preventive measures taste and odour),Chemical analysis)	6
Treatment of water (Need ,Screening,Sedimentation, Filtration, Aeration, Disinfection, Water softening)		Treatment of water (Need ,Screening,Sedimentation, Filtration, Aeration, Disinfection, Water softening)	4	Treatment of water (Need ,Screening,Sedimentation, Filtration, Aeration, Disinfection, Water softening)	16

Distribution & Plumbing system (Requirements of good distribution system,Methods of supply, Clear water reservoir ,Break pressure tank , Types & laying of pipes, Pipe joints, Valve & fittings, Maintenance)		Maintenance,Methods of supply,	7	Distribution & Plumbing system (Requirements of good distribution system,Methods of supply, Clear water reservoir ,Break pressure tank , Types & laying of pipes, Pipe joints, Valve & fittings, Maintenance)	8
Introduction of sanitation (Definition and role,Systems of sanitation,sewage, Types & laying of sewers)		Introducation of sanitation (Definition and role,Systems of sanitation,sewage, Types & laying of sewers)	2	Introduction of sanitation (Definition and role	
Sewage disposal (Importance, Land treatment,Dilution method,Self-purification of river)		Sewage disposal (Importance, Land treatment,Dilution method,Self-purification of river)	2.5	Sewage disposal (Importance, Land treatment,Dilution method,Self-purification of river)	5
Disposal of excreta in unsewered area (Pit privy, VIP latrine, Pour flush latrine, Septic tank)		Disposal of excreta in unsewered area (Pit privy, VIP latrine, Pour flush latrine, Septic tank)	2.5	Disposal of excreta in unsewered area (Pit privy, VIP latrine, Pour flush latrine, Septic tank)	2
Solid Waste management (Definition,Types of wastes; effects and disposal,Onsite management, Waste segregation, Collection of solid waste, 4R principle)		Solid Waste management (Definition,Types of wastes; effects and disposal,Onsite management, Waste segregation, Collection of solid waste, 4R principle)	3	Disposal of excreta in unsewered area (Pit privy, VIP latrine, Pour flush latrine, Septic tank)	2
		Extra Contents			
		Irrigation System and structure,River training and protection works			

Grade 9: Construction Technology and workshop Practice		Subject 1:Construction Technology; Subject 2: Workshop Practice		Subject 1: …..........; Subject 2: …...........	
	128				
Construction material (Introduction,Building materials: Building stones, Bricks, Blocks, Timber, Glass, plastics, bitumen, Cement Stabilized Earthen Block (CSEB), their properties and uses in construction, Other materials: Autoclaved Aerated Concrete (AAC) blocks, Polymer blocks,Mortars: Types, properties and uses)		Construction material (Introduction,Building materials: Building stones, Bricks, Blocks	49.5		
Masonary works (Introduction ,Classification of stone masonry,Brick masonry: Types,Defects, Block work and its uses)		Masonary works (Introduction ,Classification of stone masonry,Brick masonry: Types,Defects, Block work and its uses)	63.5		
Concrete works (Introduction , Materials used, Formworks: types, Reinforcements, importance, placement and concreting, Compaction and curing, Factor affecting strength)		Concrete works (Introduction , Materials used, Formworks: types, Reinforcements,Compaction and curing, Factor affecting strength	29		
Finishing works (Definition, types ,Various floor, wall, ceiling roof finishes)		Finishing works (Definition, types ,Various floor, wall, ceiling roof finishes)	42		
Carpentry (Importance and Scope,Different woodworking professions , Various types,Care and maintenance of tools and equipment, Safety and precautions)		Just different topics related to this is written	22.5		
Trees (Wood, cross-section , Characteristics ,Growth,Grain & Strength of wood section, Methods and tools,Characteristics and example)		somewhat related trees ike joint and stuff			

Timber (Definition,Application, Advantage and Disadvantage,Timber conversion, purpose and Methods, Seasoning of timber,Various methods of seasoning,Moisture content)		Somewhat mentioned about timber			
Defects of timbers and methods of preservation (Definition and Purpose Oil soluble and water soluble preservatives, Defects due to natural forces,Shrinkage,Hot and cold bath method,Pressure method,Preservation from termite,Different types of paints and their application)		Somewhat about preservation of timber			
Construcation joints drawing to scale (Definition and purpose,Types, Cross half lap,Mortise and Tenon,Dovetail cross half lap,Dovetail bridle, Dado,Miltered, Butt)		Construcation joints drawing to scale (Definition and purpose,Types, Cross half lap,Mortise and Tenon,Dovetail cross half lap,Dovetail bridle, Dado,Miltered, Butt)	14		
Introduction to electricity and house wiring system (Electricity and sources,Different electric symbols,process)		Introduction to electricity and house wiring system (Electricity and sources,Different electric symbols,process)			
		Extra Contents			
		Workshops on Carpentary and Bricklying are more.			
Grade 9: Water Resource Engineering		Subject 1:Water Supply, Sanitary and Irrigation Engineering; Subject 2: ….........		Subject 1: Water Supply Engineering; Subject 2: Water Resources and Irrigation Engineering	
	128				6+8

Introduction of irrigation (Definition,Necessity, Advantages and Disadvantages, Sources, Gross command area(GCA), Cultivable command area(CCA))		their causes and prevention,Water-borne diseases, washed ,Transmission routes, Preventive measures,	1	Introduction of irrigation (Definition,Necessity, Advantages and Disadvantages, Sources	3
Water requirements (Crop season, types, Base, Kor, Hrs, Crop Hrs, Delta and Duty,Duty delta relationship, Factors affecting duty,Water requirement of different crops)				Water requirements (Crop season, types, Base, Kor, Hrs, Crop Hrs, Delta and Duty,Duty delta relationship, Factors affecting duty,Water requirement of different crops)	8
Methods of irrigation (Surface, Furrow, sub surface, Drip & sprinkler irrigation, Uncontrolled, Check & Basin flooding, Zig zag method, Contour laterals)				Methods of irrigation (Surface, Furrow, sub surface, Drip & sprinkler irrigation, Uncontrolled, Check & Basin flooding, Zig zag method, Contour laterals)	5
various irrigation system (Head works: Definition, and types ,Canal head regulator, Cross Regulator, Cannel fall, weir and barrage, notch, Under sluice and silt excluder, Cross-Drainage works,Aqueducts, Siphon aqueducts, Super passage, Siphon, Level crossing,Inlet and outlet)					
Canal (Classification, Canal losses, lining, River training works)				Canal (Classification	
Water logging and drainage (Definition,Causes and effects, Causes of canal damages, maintenance tasks.,Remedial measures,Hill irrigation practice in Nepal)				Extra Contents	
,Measurement,runoff process,Infiltration,Evaporation and transpiration,Factors,rational method, Empirical methods,Stream/River discharge determination, hydrology,Aquifers,Darcy's					

Law)					
Waterpower (engineering) hydropower (Introduction,development,Flow duration curve,Firm,Power system and load,factor, layout plan,(ROR),(PROR),types of hydraulic turbine)					
		Extra Contents			
Grade 10: Building Construction and Drawing		Subject 1: Construction material.; Subject 2: Engineering Drawing		Subject 1: Building Construction; Subject 2: Construction Drawing and CAD	
	128				
Components of building (Introduction,General idea ,Components,Considerations. Foundations;Definition,Function, Requirements,Types 1.3 Staircase;Definition and classification ,Technical terminology,Design criteria. Doors/windows ;Introduction,Parts,Location,terminologies,Size and types,Ventilator and sky lights. roof covering works;Ceiling works,Flooring works)			78, 43.5	Components of building (Introduction,General idea ,Components,Considerations. Foundations;Definition,Function, Requirements,Types	4
Substructure and super structure (Types of walls ,functions,principles , ratio,Damp – proofing,prevent dampness,Materials)			33, 14.5	Types of walls ,functions,ratio,Damp – proofing,prevent dampness,Materials	5
Temporary construction (Shoring ,Underpinning,Scaffolding,Formwork for slab/beam/column ,Types)			33	Formwork for slab/beam/column ,Types,Shoring	4
Cement and concrete construction (Lime concrete, constituents,Grading, course aggregate,			48, 14.5		

mix,Workability,Methods,Factors,Bulking, Batching,Storing,Slump tests ,Steel reinforcemen, Bar bending and placing schedule)					
Earthquake resistent features (Introduction/Causes/Effects,Building Forms,Configuration,Height and Number of story,Distribution of load bearing elements,Location and size of openings,Importance of RCC bands ,Discuss)			44	Earthquake resistent features (Introduction/Causes/Effects,Building Forms,Configuration,Height and Number of story,Distribution of load bearing elements,Location and size of openings,Importance of RCC bands ,Discuss)	10
Introduction to engineering drawing/basic drafting concept (Introduction ,Engineering symbols and conventional signs,By-laws , Building codes,Drafting,foundation plan, location & Floor plans, Elevations, Sections)		foundation plan, location & Floor plans, Elevations, Sections	68		
Introduction to AutoCAD course and hardware (Overview of AutoCAD Release, PC, peripherals, Screen layout of AutoCAD, Setting preferences)				Introduction to AutoCAD course and hardware (Overview of AutoCAD Release, PC, peripherals, Screen layout of AutoCAD, Setting preferences)	2
Acto CAD commands (Drawing Commands;input methods ,Point, Lines, Polyline, Multiline, Construction Lines,Circle, Arc, Ellipse, Donut,Polygon, Rectangle, Spline, solids,Hatching, Text. Modify commands; Erase, Trim, Break,Copy, Mirror, Offset, Array,Length, Extend, Chamfer, Fillet)				"Acto CAD commands (Drawing Commands;input methods ,Point, Lines, Polyline, Multiline, Construction Lines,Circle, Arc, Ellipse, Donut,Polygon, Rectangle, Spline, solids,Hatching, Text. Modify commands; Erase, Trim, Break,Copy, Mirror, Offset, Array,Length, Extend, Chamfer, Fillet)"	5

Features (View tools and inquiry commands,Layers concept, match and change properties,Measure and divide commands,Block, W-block and External References, Plotters and Plotting ()				"Features (View tools and inquiry commands,Layers concept, match and change properties,Measure and divide commands,Block, W-block and External References, Plotters and Plotting ()"	2
		Extra Contents			
			Freehand Sketching		
Grade 10 :Highway Engineering		Subject 1:Road and Trail Bridge.; Subject 2: ….........		Subject 1: …..........; Subject 2: ….........	
	128				
Introduction (Different modes of transportation,Benefits,Importance,Classification,Role,History,Rural and urban road, advantages and disadvantages,Types of feeder roads and overview in construction,Urban Road patterns)		Classification,Role,History,Rural and urban road	4		
Road alignment and survey (Fundamental principles of alignment,Requirements,Factors,Engineering survey for highway locations)					

General definition of terms used ih highway geometric design (Traffic volume, intensity, lane, slip friction,Typical cross section in cutting and filling definition of its elements,Camber, super-elevation, extra-widening,Sight distance-definition and types, Numerical practice on extra widening and sight distance)					
Highway materials (Importance of soil engineering in road construction,Grading,Sub-grade soil, its importance and requirements for practical use,Stone aggregates, types and requirements,Binding materials)					
Highway drainage (Requirement of good drainage system and its importance,Field construction procedures)					
Road pavement and road making machineries with users (Types of pavement,General structures of pavement-sub-grade, sub-base, base and surface courses uses,Role of labor vs machinery, Earthwork machinery types and uses, Compaction equipment- Three wheeled road roller, Sheep foot rollers, Pneumatic tyred roller, Vibratory rollers,Transporting Watering equipment,Rock excavation machinery,Production of aggregates)					
Road construction technology (Embankment,Earthen road,Gravel road,WBM ,Bituminous macadam,Surface dressing, Otta seal & Rigid pavement					

construction,)					
Low cost roads and General introduction to bridges (Introduction,Types and field construction technology,Advantages of stage construction of roads,Introduction to bridges, types ,Components of bridges)					
Hill roads (Importance of hill roads and special considerations,Terminologies used in hill roads as drainage, cross-slope, grade in hill road, hair-pin-bend,Special structures such as retaining walls, breast walls, revetment walls, toe walls and slope protection works)					
NRS and Feeder road guidelines (NRS and Feeder road guidelines; Width of carriage ways, Shoulders,Medians ,Camber , Super elevation, Surface Drainage, Embankments, Side slopes,Right of Way , Lateral and vertical clearances)					
Grade 10: Engineering Surveying- I		Subject 1: Engineering Surveying; Subject 2: ….........		Subject 1:Surveying I; Subject 2: ….........	
	128				
Introduction (Definition,Objective,Uses,Classification and Basic Principles of Surveying, Definition and Types of scale,Representative Fraction, Numerical practice)		Definition,Objective,Uses,Classification and Basic Principles of Surveying, Definition and Types of scale	2	Introduction (Definition,Objective,Uses,Classification and Basic Principles of Surveying, Definition and Types of scale,Representative Fraction	4
Measurement of Distance (Accessories for Distance measurements, Types of Chains, Types of Tapes, Ranging,Classification,Horizontal Distance		Unit,Conversion	6	Leveling (Definitions, Principle ,Types,Temporary Adjustment,Booking and Reduction,Uses of Leveling,Two	8

Measurement,Unit,Conversion Table,Chain and Tape corrections ,Numerical practice)				Peg Test, Fly Leveling, Reciprocal Leveling,Curvature and Refraction Correction,Plotting, Errors,Numerical Practice)	
Reliability of Survey (Accuracy, Error,Types ,Precision,Correction)					
Chain Survey (Principles,Suitability,Unsuitability, conditioned Triangles ,Survey Stations ,Reconnaissance Survey ,Survey Lines,Offsets,Procedure,Field Book,Conventional Symbols,Procedure of Plotting)		Offsets,Procedure,Field Book,Principles	21	Chain Survey (Principles,Suitability,Unsuitability , conditioned Triangles ,Survey Stations ,Reconnaissance Survey ,Survey Lines,Offsets,Procedure,Field Book,Conventional Symbols,Procedure of Plotting)	6
Compass survey (Principles,Traversing,Types of Traverse,Types of Compass,Comparison,Meridian, Magnetic Declination,Bearing, Bearing system,Fore Bearing and Back Bearing, Local Attraction,Method of elimination of local attraction,Calculation,Sources of error in compass survey,Numerical practice)				Compass survey (Principles,Traversing,Types of Traverse,Types of Compass,Comparison,Meridian, Magnetic Declination,Bearing, Bearing system,Fore Bearing and Back Bearing, Local Attraction,Method of elimination of local attraction,Calculation,Sources of error in compass survey,Numerical practice	12
Leveling (Definitions, Principle ,Types,Temporary Adjustment,Booking and Reduction,Uses of Leveling,Two Peg Test, Fly Leveling, Reciprocal Leveling,Curvature and Refraction Correction,Plotting, Errors,Numerical Practice)				Leveling (Definitions, Principle ,Types,Temporary Adjustment,Booking and Reduction,Uses of Leveling,Two Peg Test, Fly Leveling, Reciprocal Leveling,Curvature and Refraction Correction,Plotting,	13

				Errors,Numerical Practice)	
		Extra Contents		Extra Contents	
		Principles of Surveying			
		Handling of Survey Tools			
		Theodolite Setup			
Grade 10: Estimating, Costing and Supervision – I		Subject 1: Estimating, Costing and Supervision; Subject 2: ….........		Subject 1: Estimating and Costing; Subject 2: ….........	
	128				
Definition of Estimating (Definition ,Importance,Types,Different items of works,System of measurement,Conversion)		Definition of Estimating (Definition ,Importance,Types,Different items of works,System of measurement,Conversion)	3	Definition ,Importance,Types	5
Area and volume calculation (Sectional area of regular trenches,Calculation,Estimating format,Methods of earthwork calculation)		Sectional area of regular trenches,Calculation,Estimating format	2		
Estimate quantity of masonary footing & super structure wall (Drawing,Items of works for footing construction,Drawing,Estimate,Deduction items,Drawing of simple concrete flooring works ,Density of steel, concrete, brick, stone, block,Reinforcement details ,Reinforcement spacing, bends, hooks and development length,Estimate,Define plastering, punning & pointing works,Draw & estimate two & multi room building)		Estimate quantity of masonary footing & super structure wall (Drawing,Items of works for footing construction,Drawing,Estimate,Deduction items,Drawing of simple concrete flooring works ,Density of steel, concrete, brick, stone, block,Reinforcement details ,Reinforcement spacing, bends, hooks and development length,Estimate,Define plastering, punning & pointing works,Draw & estimate two & multi room building)	10		

Rate Analysis (Define,GON norms and current district rates,Define overhead, water charge, tools and plants, profit and VAT profit and VAT,Man and materials consumption,Ratios of PCC in practice,Calculations of volume, Rate analysis of E/W, PCC, Form works, Plastering, reinforcement bar,Calculations of a cubic meter of brick work,Ratios in mortars)		Define,GON norms and current district rates,Ratios of PCC in practice,Calculations of volume,Define overhead,	33		
Quotation and tender documents (Define quotation and tender,Conditions,Types,Contract award procedure)					
Supervision works (Definition, Duties ,Interrelationship among client, consultant and contractors)		Supervision works (Definition, Duties ,Interrelationship among client, consultant and	46		
Construction site management (Major components of construction site,Site logistics, utilities,Surface drainage and sanitation,Site safety)		contractors)	10.5		
Prepare log book and muster roll (Log book and its uses,Format,Definition,Types of workers)		Log book and its uses,Format	5		
Measurement book and billing process (Definition ,Importance,Size,Definition of bill of quantities (BOQ),abstract of cost,Procedure of running bill payment)		Measurement book and billing process (Definition ,Importance,Size,Definition of bill of quantities (BOQ),abstract of cost,Procedure of running bill payment)	12.5		
Layout work (Procedure,Equipment,Preparation)					
Grade 11: Geo-Technical Engineering		Subject 1: …..........; Subject 2: ….........		Soil Mechanics and Foundation Engineering	
	128				

Overview Geotechnical Engineeing (Engineering definition of soil, Importance of soil in Civil Engineering Structures, Field application of geotechnical engineering foundation design, pavement design, design of earth retaining structures, slope stability)		✕		Engineering definition of soil, Importance of soil in Civil Engineering Structures	2
Physical Properties of Soil (Soil as three phase diagram,Water content ,Void ratio, porosity and degree of saturation, density index,Unit weight of soil mass,core cutter method and sand replacement method,specific gravity by pycnometer,Atterberg's limits of consistency,Determination of liquid limit,Particle size distribution,Different classification of soils,Numerical problems)				Soil as three phase diagram,Water content ,Void ratio, porosity and degree of,specific gravity by pycnometer saturation, density index	6
Permeability of soil & Seepage Analysis (Definition of permeability,Derive Darcy’s law of permeability, factors affecting permeability,coefficient of permeability by constant head, earthen structures,application of flow net)				Permeability of soil & Seepage Analysis (Definition of permeability,Derive Darcy’s law of permeability, factors affecting permeability,coefficient of permeability by constant head, earthen structures,application of flow net)	9

Shear Strength of Soil (Shear failure of soil, field situation of shear failure,Concept ,Components of shearing resistance of soil – cohesion, internal friction,Mohr-coulomb failure theory,Purely cohesive and cohesion-less soils,Laboratory determination)				"Shear Strength of Soil (Shear failure of soil, field situation of shear failure,Concept ,Components of shearing resistance of soil – cohesion, internal friction,Mohr-coulomb failure theory,Purely cohesive and cohesion-less soils,Laboratory determination)"	6
Bearing Capacity of Soils (Concept of bearing capacity, Terzaghi's analysis and assumptions ,Effect of water table on bearing capacity,Test procedures ,Typical values of bearing capacity,active earth pressure and passive earth pressure,active earth pressure and passive earth pressure)				"Bearing Capacity of Soils (Concept of bearing capacity, Terzaghi's analysis and assumptions ,Effect of water table on bearing capacity,Test procedures ,Typical values of bearing capacity,active earth pressure and passive earth pressure,active earth pressure and passive earth pressure)"	9
Site Investigation and Sub soil Exploration (Necessity of site investigation & sub-soil exploration,Types ,Method of site exploration open excavation & boring,Criteria,Disturbed & undisturbed soil samples for lab testing,Field identification of soil)					
Design of retaining walls (Functions of retaining wall,Identify sites,Practical Features,Special features of dry masonry,Special features of gabion construction,Front-battered,causes of Retaining wall Failure,construction techniques for increasing stability ,Design Consideration)					

Survey information and design consideration for Ceck dam (Practical Features, Design consideration,Hydrological Aspects,Hydraulic Elements,Spillway Section,Scour Holes,Strain Cases,Static and Soil Mechanical Calculation,Stabilization of Gully head)					
Gabion Structures (Describe advantages,weaving gabion Baskets,Classification of mesh and mesh opening,Design consideration,Characteristics of fill material,Design drawing and implementation of gabion spurs, revetments)					6
Bio engineering (Define, Causes and Mechanism of Slope failures, Functions,Design small Scale Civil Engineering System,vegetative System,Compare interaction,Species, Optimal technique)					
Foundations (Construction of spread footings,mat foundations,pile foundation,Pile load tests,Damage, alignment and effect of pile driving, Pier foundations,Sinking of caissons,Ground Water in excavations and methods)					
Geosynthetics (Classification,Compare application,Design Considerations, Construction Requirements)					
Grade 11: Estimating, Costing and Supervision		Subject 1: Estimating, Costing and Supervision; Subject 2: ….........		Subject 1: Estimating and Costing; Subject 2: ….........	
	128				
Introduction to road work estimate (Terms use,Method of estimating of road works)					

Earthwork in road construction (methods of earthwork calculation,plain area,vertical drop,hilly area)				"Earthwork in road construction (methods of earthwork calculation,plain area,vertical drop,hilly area)"	10
Valuation (Definition,Purpose of valuation, principle,Factors ,Definition of terms,Methods,Methods of writing valuation report)				Valuation (Definition,Purpose of valuation, principle,Factors ,Definition of terms,Methods,Methods of writing valuation report)	10
Specifications (Definition,Purpose,Types,Necessity,Technique, and Writingof specification,Detailed specification)				Specifications (Definition,Purpose,Types,Necessity,Technique, and Writingof specification,Detailed specification)	12
Estimation of Building (Data,Principle of units,payment,Limits of measurement and degree of accuracy,Methods, types of forms,Preparation of detailed estimate)				Estimation of Building (Data,Principle of units,payment,Limits of measurement and degree of accuracy,Methods, types of forms,Preparation of detailed estimate)	26
Estimate of other structures (Ddetailed estimate; Culvert, Safety tank, Man holes, Soak pit,prefabricated structures using different materials)					
Grade 11: Engineering Surveying		Subject 1: Engineering Surveying.; Subject 2: ….........		Subject 1: Surveying; Subject 2: ….........	
	128				
Plane Table Surveying (Principle,Accessories Required ,Working Operations,Orientation,Methods,Errors,Advantages and Disadvantages,Numerical Practice)				Principle	

Theodolite survey (Introduction ,Explain geometry of the Theodolite,Uses,Temporary Adjustment,Methods of Measuring Horizontal Angle,Theodolite traverse,Field work,computation of total coordinates,Plotting ,Omitted measurements,Sources of Errors,Total station,Numerical Practice)				"Theodolite survey (Introduction ,Explain geometry of the Theodolite,Uses,Temporary Adjustment,Methods of Measuring Horizontal Angle,Theodolite traverse,Field work,computation of total coordinates,Plotting ,Omitted measurements,Sources of Errors,Total station,Numerical Practice)"	21
Contouring (Definitions,Selection ,Characteristics,Uses,Methods,Interpolation, Numerical Practice)				Contouring (Definitions,Selection ,Characteristics,Uses,Methods,Interpolation,Numerical Practice)	8
Tacheometric Surveying (Introduction,Instrument used,Methods,Stadia Method,Subtense Method,Tangential Method,Self Reducing Method,Numerical Practice)				Tacheometric Surveying (Introduction,Instrument used,Methods,Stadia Method,Subtense Method,Tangential Method,Self Reducing Method,Numerical Practice)	8
Trigonometric Leveling (cases,Refraction and curvature correction by linear method,Field procedures and problems)					
Horizontal Curves (definition and purposes,Classification,Designation,Elements,Design and setting out of curves, Linear method,Deflection angle method)				Transition and Composition Curves (Introduction and purposes,Classification of transition curves,Elements)	10
Vertical Curves (Definition and purposes,Types,Length,Computation and setting out of vertical curves by tangent correction and parabolic equation Method)				"Vertical Curves (Definition and purposes,Types,Length,Computation and setting out of vertical curves by tangent correction and parabolic equation Method)"	7
Transition and Composition Curves (Introduction and purposes,Classification of				Transition and Composition Curves (Introduction and	4

transition curves,Elements)				purposes,Classification of transition curves,Elements)	
		Extra Contents			
		Introduction to Surveying			
		Hydrographic Surveying			
		Alignment Surveys			
Grade 11: Applied Mechanics		Subject 1: …..........; Subject 2: …..........		Applied Mechanics	
	128				
Introduction (Definition and scope,Concept of Particle,Equilibrium of particle and Rigid Body,Equations of Static Equilibrium,Two Dimensional analysis)					6
Forces acting on particle and Rigid Body (Different types of Forces,Resolution and Composition of Forces,Principle of Transmissibility and Equivalent Forces,Moments and Couples,Varignon's Theorem,Resolution,State and Prove: Triangle Law of Forces, Parallelogram law of Forces Polygon Law of Forces and Lami's Theorem)					
Friction (Definition, Causes, Advantages, Disadvantages and Types,Laws of Dry Friction,Static and Dynamic Friction and Their Coefficients,Angle of Friction,Different status,Sliding and Tipping Condition of the Body)					5

Center of gravity and centroid (Concept of Centre of Gravity, Centroid, Axis of Symmetry,Centroid of regular and Composite lines,Composite Area ,Area under curve by the method of Integration)					5
Moment of intertia (First Moment and Second Moment of Area,Axial and Polar,Moment of Inertia of Regular Areas,Perpendicular and Parallel axis Theorem, Composite Area,Radius of Gyration)					7
Structures (Structure and Mechanism,Plane and Space Structures,Different type of loads,Supports in the Structures and types,Determinacy and Stability,External and Internal forces)					3
Analysis of Statically Determinate Beam (Definition and Types of Beam,Calculation of Support Reactions and Internal Forces,Relationship between load, shear force and bending moment,Determination of axial force, shear force and bending moments,Draw Axial Force, Shear Force and Bending Moment Diagrams)					3
Analysis of Statically Determiate Plans Truss (Definition, uses and Types of Trusses,Calculation of Member Force by the Method of Joints,Calculation of Member Force by the Method of Sections,Assumption of ideal truss)					5

Grade 12: Mechanics of Structure		Subject 1: …..........; Subject 2: ….........		Subject 1:Mechanics of Structure; Subject 2: Applied Mechanics	
	128				
Introduction (Brief History,Strength, Stiffness and stability,Basic Assumptions,Types of loads, supports,Types and number of reaction at the support,Boundary conditions and degrees of freedom,Statically determine and indeterminate structures)		✗			
Statics of Structures Reactions (Supports – hinged, roller and fixed supports and their characteristics,Idealization of structural systems,Equations of static equilibrium, Equations of conditions,Classification of structural systems,Instability of structural systems, Comparison between determinate and indeterminate structures)					

Axial Force, Shear Force and Bending Moment (Definition, Physical Meaning, and Sign Convention, Beams and Frames, Degree of indeterminacy for beams and simple frames,Writing expressions for shear and moment at a section of a beam in terms of applied loads, Construction of shear force and bending moment diagrams,Relationship between load, shear and moment; concept of shear center; principle of superposition)					
Centre of Gravity and moment of Inertia (Introduction and definitions,Lamina,Moment of inertia of a lamina,Moment of inertia of laminae of various shapes ,Problems for exercise)					

Plane Trusses (Introduction ,Describe riveted and bolted joints and their Failure,Explain Rivets value and efficiency of joints,Define Welded joints,Design of riveted bolted joints under axial force,Details of riveted and bolted joints under axial forces,Design of welded joints under axial forces,Determinacy and stability of planar trusses,Forces in the members of a truss, types of trusses,Analysis of trusses,Application of two methods for the determination member forces in the truss,Identification of compression, tension and zero force members)					
Stresses and strains (Linear stress and strain and their relation, Hooke's law and Young's modulus of elasticity,Deformation of uniform bar due to axial force,Stress-strain curves for different materials,Ultimate strength and working stress of materials and factor of safety,Factors affecting factor of safety,Thermal stress,Stress and strains in plain and composite bars. , Poisson's ratio,Shear stress shears strain and modulus of rigidity,Volumetric strain and Bulk modulus,Relation between Young's modulus, Bulk modulus and modulus of rigidity,Problems in stresses and strains)					

Theory of Flexur: bending, Shear (Introduction,Analysis of beam of symmetric cross-section,Assumptions in theory of simple bending,Radius of curvature, neutral layer and neutral axis,Stress due to bending,Moment of resistance,Derivation of flexural formula,Section modulus,Shearing stress in beams,Distribution of shear stress in rectangular and circular cross sections of beam)					
Deflection of Beam (Definition of elastic curve, slope and deflection in a beam,Differential equation of elastic curve, Deflection of simply supported and cantilever beams by double integration method,)					
Torsion (Introduction, Stress and deformation in a uniform shaft, ,Definition of torque and angle of twist, Stress due to torsion, Derivation of torsional equation, Strength of solid and hollow circular shaft, Power transmitted by shaft)					
Columns and struts (Introduction,Buckling of column, Euler's column equation for different end conditions, Slenderness ratio, Introduction of eccentrically loaded columns.)		Extra Contents			
Grade 12: Fluids Mechanics		Subject 1: …..........; Subject 2: ….........		Subject 1: Fluid Mechanics and Hydraulics; Subject 2: ….........	
	128				

Introduction (Introduction to Fluid Mechanics and Hydraulics,Properties of fluid,Difference between real and ideal fluid,Difference between Newtonian and Non Newtonian fluid,)		✕		Introduction (Introduction to Fluid Mechanics and Hydraulics,Properties of fluid,Difference between real and ideal fluid,Difference between Newtonian and Non Newtonian fluid,)	3
Hydrostatics (Introduction to fluid pressure,Pascal’s law,Derivation for pressure-depth relationship ,Definition of atmospheric pressure, gauge pressure and absolute pressure,Measurement of pressure by piezometer and U-tube manometer,Definition of total pressure and center of pressure,Derivation for total pressure and center of pressure on vertical and inclined plane,Derivation for total pressure and center of pressure on vertical and inclined plane submerged surface,Definition of Buoyancy, center of buoyancy and Archimedes’ principle,Principle of floatation)				"Hydrostatics (Introduction to fluid pressure,Pascal’s law,Derivation for pressure-depth relationship ,Definition of atmospheric pressure, gauge pressure and absolute pressure,Measurement of pressure by piezometer and U-tube manometer,Definition of total pressure and center of pressure,Derivation for total pressure and center of pressure on vertical and inclined plane,Derivation for total pressure and center of pressure on vertical and inclined plane submerged surface,Definition of Buoyancy, center of buoyancy and Archimedes’ principle,Principle of floatation)"	10
Hydrokinematics (Types of flow,Reynold’s number,Streamline,Conservation principles and continuity equation for one dimensional incompressible flow)				Hydrokinematics (Types of flow,Reynold’s number,Streamline,Conservation principles and continuity equation for one dimensional incompressible flow)	5

Hydrodynamics (Energy of flowing fluid,Concept of energy head,Bernoulli's theorem: Statements, assumptions, equation and applicability,Concept of Hydraulic gradient line (HGL) and energy gradient line (EGL))				"Hydrodynamics (Energy of flowing fluid,Concept of energy head,Bernoulli's theorem: Statements, assumptions, equation and applicability,Concept of Hydraulic gradient line (HGL) and energy gradient line (EGL))"	3
Pipe Flow (Introduction to pipe flow,Velocity profile for laminar and turbulent flow through pipes,Loss of head in pipes,Derivation of Darcy-Weisbach equation for loss of head due to friction,Derivation of equation for expansion and contraction loss)				Pipe Flow (Introduction to pipe flow,Velocity profile for laminar and turbulent flow through pipes,Loss of head in pipes,Derivation of Darcy-Weisbach equation for loss of head due to friction,Derivation of equation for expansion and contraction loss)	6

Open Channel Flow (Difference between pipe flow and open channel flow,Types of open channel flow,Geometric elements of open channel,Velocity distribution in open channel flow,Chezy's equation and Manning's equation for the computation of velocity inuniform flow,Energy equation and momentum equation in open channel flow,Specific energy: Definition, equation and diagram)				Open Channel Flow (Difference between pipe flow and open channel flow,Types of open channel flow,Geometric elements of open channel,Velocity distribution in open channel flow,Chezy's equation and Manning's equation for the computation of velocity inuniform flow,Energy equation and momentum equation in open channel flow,Specific energy: Definition, equation and diagram)	8
Flow measurements (Orifice,Derivation of equation for discharge through small orifice,Hydraulic coefficients ,Concept of venturimeter, derivation of equation for discharge through venturimeter,Introduction to weir or notch and their classifications,Derivation of equation for discharge through rectangular, triangular and trapezoidal weir or notch,Area-velocity method for the discharge measurement in open channel)				"Flow measurements (Orifice,Derivation of equation for discharge through small orifice,Hydraulic coefficients ,Concept of venturimeter, derivation of equation for discharge through venturimeter,Introduction to weir or notch and their classifications,Derivation of equation for discharge through rectangular, triangular and trapezoidal weir or notch,Area-velocity method for the discharge measurement in open channel)"	10

Grade 12: RCC Structure		Subject 1: …..........; Subject 2: ….........		Subject 1: Design of Reinforecd Concrete (RC); Subject 2: ….........	
	128				
Design concept of Reinforced concrete (Properties of concrete and steel reinforcement, Behavior of reinforced concrete in bending, Design of a reinforced concrete section, Modular ratio, permissible and ultimate stress, Describe ultimate load and limit state method of design)				"Design concept of Reinforced concrete (Properties of concrete and steel reinforcement, Behavior of reinforced concrete in bending, Design of a reinforced concrete section, Modular ratio, permissible and ultimate stress, Describe ultimate load and limit state method of design)"	14
Introduction of reinforced concrete structures (Different design philosophies,Working stress method of design,Limit state method of design,Describe concept of singly and doubly reinforced sections,Concept of partial factor for loads and materials,Stress–strain diagram,Explain Position of neutral axis, Moment of resistance,Compare Under reinforcement)					

Design of reinforced concrete structure (Analyze singly and doubly reinforcement rectangular sections,singly reinforced flanged sections,Design of rectangular and flanged section,Design of one way and two way slabs using NS Code,Practice on the use of different Codes)				"Design of reinforced concrete structure (Analyze singly and doubly reinforcement rectangular sections,singly reinforced flanged sections,Design of rectangular and flanged section,Design of one way and two way slabs using NS Code,Practice on the use of different Codes)"	14
Design of reinforced concrete structure (Analyze singly and doubly reinforcement rectangular sections,Analyze singly reinforced flanged sections,Design of rectangular and flanged section,Design of one way and two way slabs using NS Code,Practice on the use of different Codes)					
Axial Loaded R.C. Colums (Types of compression members,Design of a RCC short column,Reinforcement and ductile detailing,Practice Code requirements)					
introduction (Introduction to steel structures, Types & properties of steel ,Allowable stresses in structural steel,Concept of limit state design in steel structure., Use of steel as a structural member in construction, Codes of practice for design of steel structures,Advantage and disadvantage)					

Design of Tension and Compression Memebers (Types of Tension Member, Net Sectional Area , Design of members subjected to axial load ,End condition & Effective lengths ,Radius of gyration and slenderness ratio ,Strength of compression members,Design of compressive members)					
Design of Roof Trusses (Different types of loads on roof truss ,Introduction to the design of roof trusses, Tubular sections,Connection used in steel roof truss)					
Tmber Strucures (Introduction to timber,Properties,Use of timber as a structural member ,Practice Code for design of timber structures,Advantage & disadvantage ,Stresses in timber as per code.)					
Design of Timber Structure(Design of compression member ,Design of solid rectangular beam,Codal provision in deflections of Beam)		Extra Contents			
Grade 12: Construction Management		Subject 1: …..........; Subject 2: …........		Construction Management	

Introduction (Definition of Project,Characteristics,Definition of Management,Need of Construction Management,Functions of Construction Management)	128	✗		"Design of reinforced concrete structure (Analyze singly and doubly reinforcement rectangular sections,singly reinforced flanged sections,Design of rectangular and flanged section,Design of one way and two way slabs using NS Code,Practice on the use of different Codes)"	8
Project planning and scheduling (Definition ,Steps,Importance,Construction Site,Work Breakdown Structure,Bar Chart,Linked Bar Chart and Milestone Chart,Advantages of Construction Schedule,Preparation,Material Schedule,Labor Schedule,Equipment Schedule,Financial Schedule)				Project planning and scheduling (Definition ,Steps,Importance,Construction Site,Work Breakdown Structure,Bar Chart,Linked Bar Chart and Milestone Chart,Advantages of Construction Schedule,Preparation,Material Schedule,Labor Schedule,Equipment Schedule,Financial Schedule)	12
CPM and PERT (Introduction,Elements of Network,Network Rules,Definition of the Terms: Network Diagram, Activity, Event, Forward Pass, Backward Pass, Critical Path,Determination of Critical Paths and Floats,Introduction to PERT and terminologies used,Numerical Practices on CPM and PERT)				"CPM and PERT (Introduction,Elements of Network,Network Rules,Definition of the Terms: Network Diagram, Activity, Event, Forward Pass, Backward Pass, Critical Path,Determination of Critical Paths and Floats,Introduction to PERT and	14

				terminologies used,Numerical Practices on CPM and PERT)"	
Contract Administration and Accounts (Definition,Essentials elements of a Valid Contract,Types of Construction Contracts,Information to be given in Tender Notice,Tender Document,Bid Bond and Performance Bond,Contract Document,Conditions of Contract,Supervising Work of a Contractor,Duties and Responsibilities of a Site Supervisor,Ethics of a site supervisor as a professional Engineer,Site Order Book,Materials at Site Account,Muster Roll,Measurement Book,Running Bill and Final Bill,Completion Report,Relation between Owner, Consultant, and Contractor)				"Contract Administration and Accounts (Definition,Essentials elements of a Valid Contract,Types of Construction Contracts,Information to be given in Tender Notice,Tender Document,Bid Bond and Performance Bond,Contract Document,Conditions of Contract,Supervising Work of a Contractor,Duties and Responsibilities of a Site Supervisor,Ethics of a site supervisor as a professional Engineer,Site Order Book,Materials at Site Account,Muster Roll,Measurement Book,Running Bill and Final Bill,Completion Report,Relation between Owner, Consultant, and Contractor)"	20
Quality (Definition ,Characteristics,Factors affecting,Stages of Quality Control/ Assurance)				Quality (Definition ,Characteristics,Factors affecting,Stages of Quality Control/ Assurance)	7
Monitoring, and Control (Introduction,Purpose,Introduction to				Monitoring, and Control (Introduction,Purpose,Introduction	7

Control,Elements of Control: Quality, Cost, and Time,Quality Control,Cost Control,Time/Schedule Control)				to Control,Elements of Control: Quality, Cost, and Time,Quality Control,Cost Control,Time/Schedule Control)	
Construction Equipment (Advantages of using Construction Equipment,Equipment for Excavation,Equipment for Concrete Mixing,Equipment for Transportation and Compaction,Equipment for Lifting of Materials and Parts)				Construction Equipment (Advantages of using Construction Equipment,Equipment for Excavation,Equipment for Concrete Mixing,Equipment for Transportation and Compaction,Equipment for Lifting of Materials and Parts)	8
Health and Safety(Introduction to Accidents in Construction Sites ,Causes of Accidents, Importance of Safety,Safety Measures)				"Health and Safety(Introduction to Accidents in Construction Sites ,Causes of Accidents, Importance of Safety,Safety Measures)"	6

Electrical Engineering

Technical Stream Contents	**Work Hour**	**Prediploma**	**Work Hour**	**Diploma**	**Work Hour**
This column lists all contents or topics as they are covered in courses from Technical Stream.	Mention work hour as written in the curriculum document	Indicate whether the specific content is present in the curriculum for pre-diploma courses (e.g., If present, copy and past similar conents; if different, write them under extra contents) if any content in CDC curriculum is not found in relevant pre-dipoma program put a ✗).	Mention work hour as written in the curriculum document	Indicate whether the specific content is present in the curriculum for diploma courses (e.g., If present, copy and past similar conents; if different, write them under extra contents). If any content in CDC curriculum is not found in relevant dipoma program put a ✗).	Mention work hour as written in the curriculum document

Grade 9: Subject 1: Computer Application (4 Cr)	128 (64 T+64 P)	Engineering Drawing and Computer Application			
Introduction to Computer (Concepts, history of computers, characteristics, capabilities/limitations of computers, types, generations, types of PC/Es and their characteristics	7	The Course "Engineering Drawing and Computer Application" does not complately mathch with course "Computer Application". But Student must have knowledge of course " Computer Application" so that they can do drawing and run application like auto CAD.	16		
Computer System (Concept of computer organization, identify hardware parts, basic components of a computer system, memory, storage device, input device, characteristics of monitor, computer software)	14				
Operating System (Introduction, classification, disk operating system (DOS), windows operating system, Open sources operating system	8				
Programming languages (introduction and levels, compiler, interpreter and assembler, types of High Level Programming Lanugages, difference between program and software, program control structure, program design tools, introduction to QBASIC	6				

Application of Software (word processing concepts and types, Spreadsheet, presentation,	16				
Computer Networks and Topologies (introduction, Mode of transmissions flow, communication channels, Modem, types of network, typlologies of LAN, components of LAN, use of communication in daily life	7				
Internet and Electronic mail (Email): Introduction and uses of internet and email, concepts of protocols, intro to web and search engine)	6				
		Extra Contents		Extra Contents	
		drawing; use of drawing tools; drawing different types of lines and shapes and drawing electricals shapes			

Grade 9: Engineering Drawing (4 Cr Hr)	128 (64 T+64 P)	1: Engineering Drawing and Compuer Application; 2: Electrical Installation	0	1: Electrical Engineering Drawing I ; 2: Computer Aided Design 3: Fundamental of Electrical Engineering; 4: Civil Construction and Survey	0

Introduction of drawing (introduciton, history, types); drawing materials (drawing sheet, pencil, pens, tape, eraser, erasing brush, base paper, drawing tools and their functions, care and handing process of drawing tools & equipment, uses and advantages of drawing tools, procedure of drawing, freehand practice, practice of horizontol line, vertical line, inclined line, practice of square, rectange and polygons, practice of circles, lettering and types, advtanges of engineering lettering, standard size and style of engineering lettering, dimensioning, chain and size dimension, types of dimensioin lines, procedure of dimension lines	8	Elctrical Engineering Drawing (Draw electrical symbols; Draw the electrical diagram; Draw complete diagram of domestic, commercial building system with architechural building plan and cost calculation; Draw Motor control system diagram; Draw winding diagram of different types motor and connection diagram of single phase motor; Draw single line diagrams of generation, transmission and distribution system;		**1Y: Engineering Drawing I**: Introduction of Engineering Drawing (Types of drawing i.e. Engineering drawing and Artistic drawing and Engineering drawing define as Graphical language or universal language of engineering technical persons, Introduction of drawing material i.e. drawing as drawing paper, drawing board, adhesive tape, pencil, eraser, sharpener etc, Drawing tools like set square, compass divider etc, Conventional line and its type and their uses and line weight, Drawing paper size and simple graphical symbols of civil works (at least 10 symbols), Practical exercise of horizontal, vertical, inclined line using the Drawing tools and material with symbols and paper sizes.	

Introduction of geometrical shapes (line and classification of lines, procedures to draw differnet types of lines, uses and advantages of line, introduction of geometrical shapes, concept of cirlces and its parts, concept of division,	10	Computer application and auto CAD (Draw lines; Draw rectangle; Draw arc; Draw circle; Drawpolygon; Draw an Isometric drawing; Draw Ellipse)		**1Y: Engineering Drawing I:** Geometric primitives (line, triangle, quadrilateral, regular polygons and circle and its name of its parts).	
Scale (Concept and types, advantages of different types, procedure to prepare differnet types of scale (full scale, reduced scale, enlarge scale)	3				
Tangent (concept, types, process of constructing tangent)	3				
Engineering Curves and Conic section (concept of curve, types of engineering curve, construct differnet types of curves, concept of cone and conic section, construct different types of cone and conic section)	10				
Orthographic Projection (concept of projection, introduction to orthographic projection, principles and rules of projection, concept and rules of first angle and third angle projection, procedures of orthographic projection, construct different types of orthographic projection (prism, cylinder, pyramid, cone), construct different types of Orthographic projection of different combine models (flat, inclined, circular surface), concept of seciton, rules/need/importance of section, different types of sectional plane, construction of different sectional plane (longitudinal and crossed section), practice of sectional view on circular and flat surfaces)	14				

Pictoria Projection (introduction, types (oblique, isometric, perspective), general rules of pictorial projection, construct different types of pictorial projections, orthographic projection of a model into Isometric and Oblique view by box method, projection of points)	10				
Surface development (concept of development, introduction of surface development, practice of parralel line, radial line and triangulation methods; practice of prism, cylinder, pyramid and cone surface development)	6				
		Extra Contents		Extra Contents	
Grade 9: Basic Electrical Engineering (4 Cr)	128 (64 T+64 P)	1: Electrical Installation 2: Basic Electronics, 3: Electro Technology; 4: Power Distribution System Sub 6: Repair and maintenance	45	1: Fundamental of Electrical Engineering; 2: Basic Electronics and Logic Circuit; 3: Electric Circuit Analysis; 4: Electrical Machines I; 5: Switchgear and protection; 6: Fundamental of control system; 7: Micro Hydropower; 7: Instrumentation system	2

Electrostatics (Concept and history, concept of atom and its structure, introduction of atomic number, atomic weight, free electrons and electric charge, types of electricity (dynamic/static), concept of force, force between two charges (coulumb's law), define electric field, potential and potential difference, electromotive force and battery, sources of energy, voltage and its units)	4	**Electro-Technology**:Concept of modern electron theory: Matter, Molecule, Atom, Protons, Neutrons, Electrons; Structure of Atoms); EMF and P.D. Current, voltage, resistance and power, Cells and battery	3+6	**3Y; Fundamental of Electrical Engineering;** Electrostatics(Laws of electric forces, Electric field and electric field intensity, Electric fluxes and flux density, Dielectrics, permittivity and relative permittivity, Electrostatic induction phenomena, Electric potential, potential difference and potential gradient, Capacitors and capacitance, Series and parallel connection of capacitors and related numerical problems, Factors affecting capacitance, Energy stored in charged capacitor, Charging and discharging of capacitor, time constant for charging/discharging)	

DC Electric Circuit (Electric circuit and its parameter (voltage, current and resistance), movement of electrons in a computer, concept of electric current and its unit, conventional direction of electric current and its uses, electric resistance and its role of electric resistance in electrical circuits, factors affecting value of resistances, specific resistance, tyhpes of electric circuits (open, close, short), connection of resistance in series and parallel and their equivalant resistance, uses and advantages of series and parallel circuit, Ohm's law and its application; Kirchhoff's current law/Voltage Law; electrical power and its unit and practical application, electrical engery, its unit and practical application, simple numerical examples)	16			**3Y; Fundamental of Electrical Engineering:** Electric Circuit Fundamentals (Circuit elements: Resistor, Inductor, Capacitor; Electric current and voltage: definition and explanation; Independent and dependent sources; Series and parallel circuits; Ohm's law: definition, explanation and limitations; Kirchoff's law: explanation and application, Electric power and energy, Numerical problems)	2

Capacitors (capacitor and capacitance and its units, factors affecting capacitance of a capacitor, characteristics of parallel plate capacitor, series and parallel connection of capacitor and their equivalnt, concept of charging and discharging of capacitor)	6	**Basic Electronics:** Check the value of capacitor	10	3Y; **Fundamental of Electrical Engineering:** Electrostatics (Capacitors and capacitance; Series and parallel connection of capacitors and related numerical problems 3Y: **Basic Electronics and Logic Circuit;** Introduction to electronic passive components (Capacitors, Types of Capacitors and their application in Electrical & Electronic circuit) 1Y: **Engineering Physics II**: Electrostatics and capacitors (Capacitors, types of capacitors; Grouping of capacitors, action of dielectrics)	1+2+2

Magnetism and Electromagnetism (Magnet and magnetism, types of magnet (temporary/permanent), magnetic and non-magnetic materials, magnetic terminology (magnet field, magnetic field intensity, lines of magentic flux, flux density), magnetic field and its direction due to a current carrying conductor, principle of electromagnetic induction, statically and dynamically induced emf., inductor, inductance and its unit (self-inductance, mutual inductance)	8	**Electro-Technology**:Importance of magnetism in electricity, Magnetism terms- magnetic poles, magnetic axis, magnetic field, magnetic lines of force, magnetic flux, magnetic field strength, magnetic force (MMF) magnetic field intensity, reluctance, permeability, Properties of lines of force, Dimagnetic,Paramagnetic, Ferromagnetic materials	16	1Y: **Engineering Physics II:** Electrostatics, Current and Electromagnetism (Magnetic effect of current and electromagnetism) 3Y: **Fundamental of Electrical Engineering:** Magnetism and Electromagnetism (Definition of magnetic field, magnetic flux, flux density, filed intensity and permeability of magnetic material, domain theory of magnetism; Permanent magnets and electro-magnets; Permeability and relative permeability of magnetic material; Dia-magnetic, para-magnetic and ferro-magnetic materials; Magnetic field due to current carrying conductor, force on a current carrying conductor; Hysteresis loop for magnetic material, hard and soft magnetic material)	6+8

Fundamentals of alternating current and single phase circuits (DC current and AC current, generation of AC voltage, terms of AC fundamentals (Wave, cycle, frequency, wavelength, time Hrs., amplitude, phase, phase difference, instantaneous, RMS, Average value, form factor, peak factor), Reactance and impedance, analysis of simple AC circuits (waveform, phasor diagram and equation, power factor, active and reactive power), resistor only, inductor only, capacitor only, resistor and capacitor in series, resistor and inductor in series, resistor, inductor and capacitor in series, parallel AC circuit; solve simple numericals)	18	**Electro-Technology**:Explan advantage and application of A.C. and D.C; Law of conservation of energy, Ohm's law, Kirchhoff's laws, Specific resistance, Effect of temperature on resistance, Connection of cells and battery, Effects of electric current			
Three phase Circuit (concept, general idea of generation of 3 phase emf and phase sequence, balance and unbalanced system, concept of star connection and Delta connection, introduction to line/phase voltage, line/phase current, relationship between line and phase quantities in star and delta connnections, power in three phase system; advantages of 3 phase over single phase	12	**Electric Installation**: Connect single and three phase supply by using change over switch	19		

Grade 9: Basic Electrical Installation and Workshop Technology (4 Cr)	128 (64 T+64 P)	Subject 1: Electrical installation Subject 2: Electro Technology Sub 3: Powe Distribution system sub 4: Bench work sub 5: Electrical installation		Subject 1: Electrical installation I Subject 2: Computer aided design Sub3: Project I & II sub4: Power System operation and maintenance	
Electrical Safety Practices (concept/introduction of safety; safety rules and regulations, importance; causes oelectrical shocks and its effect; safety signs/hazards, safety attires, fire - types and extinguishers, safety precautions and regulations; rescue operations; safe value of electrical current and voltage through human body; first aid; cardiopulmonary resuscitation (CPR)	5	**Electric Installation**: Perform simulation first aid to simulated electrocuted person		3Y: **Electrical Installation I:** Introduction, descriptions, safety precautions, importance and application (Electrical hazards (fire and shock) and safety precautions)	2
Wiring Regulation (Electrical Codes; basics of Nepal National Building Code; Basics of Nepal Electricity Rules 2050)	3				
Proper use of tools and accessories (Identification of tools; types; proper handling of tools; types/sizes/ratings of tools; working procedure of using tools and materials (tools/uses of pliers and snipers); Materials; types of switches; types of lamps; types of power socket; definition and size of boxes	16	**Electric Installation**: Tools and equipment for Electrical installation, Introduction, Types, Importance & use, Safety; Electrical accessories: Introduction, Types, Importance & use	14+14	1Y: **Part I: Electricity:** (Identify electric symbols and accessories; Identify tools/equipment and its safety requirement of wiring system)	

Protective devices and Earthing and Lightning Protection System (necessity; advantage; concept and types of fuses, MCB; types of circuit breakers; concept of surge protective devices; introduction to earthing; lighting protection system in buildings)	12	**Electric Installation:** Protective device: Introduction, Types, Importance & use	14		
Electrical wiring system (introduction; types; selection of writing; rules of wiring; technical drawings and specifications as per standards of wiring)	12			3Y: **Electrical Installation I :** Introduction, descriptions, safety precautions, importance and application (Wiring rules, regulations and code of practices; Types of wiring system and accessories required for PVC and metal conduit wiring; Types of light and power fixtures. Selection of wiring cables for light and power; Types of diagram use for electrical installations or wirings; **3Y: Electrical Installation I :** Wiring projects on cubical in conduit wiring)	3+45

Installation of wiring system: concept of electric diagram and electric symbool of accessories used in domestic wiring; installation of conduits and setting cables; installation of energy metering system)	8	**Electric Installation:** Perform board wiring (One way switching, Two way switching, Intermediate switching, Call bell circuit, Go down circuit, Power and light socket/light indicator, Fuse and protective devices); Perform wiring on brick wall (surface and concealed) wall (surface and concealed) Install Main switch, Install DB, KWH meter, Fan and fan regulator/dimmer, corridor lighting, Lay the pipe in concrete slab on building	38		
Inspection, Testing and Maintenance of Wiring System (familiarisation with test instruments/test methods; continuity and discontinuity test of fuses, MCB, wires, etc.)	8				
		Extra Contents		Extra Contents	

Grade 10: Electrical Machine (4 Cr)	128 (64 T+64 P)	Subject 1: Electro Technology Subject 2: Power distribution system Sub 3: Electro Technology Sub 3: Motor installation and Control system		Subject 1: Fundamental of electrical engineering Subject 2: Electrical Engineering drawing I Sub 3; Electrical instruments and measurements Sub 4: Power electronics Sub 5: Electrical Installation II	
Electromagnetism (introduction; Electromagnetism induction)	6	**Electro Technology**: Advantages of electro-magnetism, Laws of electromagnetism			

Transformer (definition and function; Operation of transformer; Losses and efficiency; Three-phase transformer; Parallel operation of Transformers; Auto Transformer; Cooling of Transformer; Applications of Transformers)	14	**Power Distribution System:** Introduce and demonstrate pole mounted distribution transfoer (Introduction, Size and capacity, Use, Process, Protective devices (D.O. fuse, Gang operating switch, Lighting arrester, Channels of proper sizes, MCCB of proper capacity on the Four core cable of proper for connection from LT side of the transformer to the MCCB and Safety **Repair and Maintenance:** Single Phase Low volatege transformer (Introduction, Parts/components, Importance and use, Process, connection diagram, calculation of turns and size and Binding and installing)	8+14	3Y: **Electrical Machines I:** Single Phase Transformer (Operating Principle, Basic construction, operation, derivation of emf equation, Transformation ratio, Concept of ideal transformer; Constructional Details: Core type and shell type core construction, stepped type core cross-section, Types of windings; No-load operation: phasor diagram, equivalent circuit for no-load operation Operation of transformer with load: Magnetic circuit condition, amp-turn balance. Mutual and leakage fluxes, leakage reactance; Capacity of transformer: Definition, factors affecting the capacity of transformer. Equivalent circuit: Effect of winding resistance and leakage reactance, equivalent circuit of real transformer, phasor diagram for resistive load and inductive load, transformation of impedance, equivalent circuits refer to primary	14+8+2+1

				side and secondary side, percentage impedance, voltage regulation; Efficiency of transformer, Losses in transformer, Calculation of efficiency, Condition for maximum efficiency, effect of load power factor on efficiency. Testing of transformer – Polarity test, No-load test, Short-circuit test; Auto transformer: Operating principle and application; Parallel operation of single-phase transformer Numerical problems); Three Phase Transformer (Introduction: Three units of single-phase transformers used as three-phase transformer, evolution of three-phase transformer; Three-phase transformer connections: Star/Star, Delta/Delta, Star/Delta, Delta/Star, Open delta, their phasor group and applications, Relationship between primary and secondary line and phase quantities. Parallel operation of three-phase transformers	

				Parts of power transformer: Tank, Conservator, Breather, Explosion vent, Transformer oil, Terminal bushing, arching horns, Buchhloz's relay, tap-changer. Study of name plate specification of transformer. Difference between power and distribution transformer) 1Y: **Bench work;** Electrical Energy Transformation (Transformer, its function and application; 1Y **Engineering Mathematics II:** Magnetic effect of current and electromagnetism (Working of transformer)	

DC Machines (Introduction; Constructional details; DC Generator; DC Motor)	8	**Electro Technology:** Definition, Basic construction, working principles and types of : D.C. generator and its types, Alternator, Transformer, EMF equation of transformer, Transformer ratio, Transformer tests and losses, Parallel operation of alternator and transformer; D.C and A.C. Motors (Definition, Basic construction, working principles), Single phase, Three phase motors, Split phase motor, Capacitor start induction motor, Capacitor start capacitor run motors, Universal and sheded pole motors, Permanent capacitor motors, Principle of induction motor, Torque formula, Motor speed and sleep	25	3Y: **Electrical Machines I: DC Generator (c**onstructional Details: Yoke, Field poles, Field winding, Armature and its winding. Operation, operating principle, emf equation, Types of dc generator: Separately excited and self-excited and voltage build-up process, Shunt, series and compound generators, their circuit diagrams, relation between emf generated and load terminal voltage, characteristics and applications. Losses and efficiency; Armature reaction and method of reducing armature reaction. Commutation and methods of improving commutation. Application and significance of DC generator Numerical problem) DC Motor (Operation: operating principle, torque equation, back emf, roles of back emf. Types of dc motor: Shunt, series and compound, their characteristics and applications. Losses and efficiency.	13+10

				DC motor starter Speed control of dc motor Application and significance of DC motor Numerical problems	

Three phase induction machines (definition and functions of induction motor; constructional details; Operation as motor; Torque – slip characteristics of a three phase induction motor; Starting of Three phase Induction motors; Speed control of three-phase induction motor; Application of three-phase induction motors; Basic introduction to induction generator and its uses)	14	Install DOL starter to control induction motor; Install forward/reverse starter to control 3 phase induction motor (two direction motor; (manual) to control 3 phase induction motor; Install star/delta starter (semi-auto) to control 3 phase induction motor; Install star/delta starter (automatic) to control 3 phase induction motor; Install slip ring starter to control slip ring motor; Install PLC starter for 3 phase induction motor control (DOL starter)	15		

Synchronous Machines (Definition/function; constructional details; Operation as a generator; Parallel operation and Synchronization of Alternators; Synchronous motor)	12	**Electro-Technology**: Define and explain the basic construction and working of electrical machines (Single phase, Three phase motor, Split phase moto, Capacitor start induction motor, Capacitor start capacitor run motors, Universal and sheded pole motors, Permanent capacitor motors, Principle of induction motor, Torque formula, Motor speed and sleep	12	3Y:**Electrical Machines II** Perform experimental study on synchronous generator (Perform experimental study on synchronous generator; Perform experimental study on synchronization of synchronous generator; Perform experimental study on synchronous motor)	7

Single phase fractional horse power motors: (Single phase induction motor; Methods of making single phase induction motor self-starting; Single phase series motor or universal motor)	10	**Repair and Maintenance**:AC single phase motor : (Introduction, Importance and use, Process of repair and maintenance, Process of dismantle and assemble, Size/types, connection diagram, calculation of turns and size, Rewinding and installing process of coil and Log book/ work report) AC three phase motor (Balance): (Introduction, Importance and use, Process of repair and maintenance, Process of dismantle and assemble, Size, connection diagram, calculation of turns and size, Rewinding and installing process of coil, Log book/ work report AC three phase motor (Unbalance): Introduction, Importance and use, Process of repair and maintenance, Process of dismantle and assemble, Size, connection diagram, calculation of turns and size, Rewinding and	42+49+49		

		installing process of coil, Log book/ work report			
		Extra Contents		Extra Contents	

Grade 10: Basic Electronics (4 Cr H)	128 (64 T+64 P)	Subject 1: Basic electronics Subject 2: ….........		Subject 1: Basic Electronics and Logic Circuit Subject 2: Electrical Engineering materials	

Passive Components (resisters; capacitors; inductor; simple numerical related to resister color code and capacitor numeric code)	8	**Basic Electronics:** Calculate and check the value of fixed and variable resistor (Introduction, Purpose, Importance and uses, Types, Function, Setting procedure, Advantage, Log book/ Work report); Check the value of capacitors (Introduction, Importance and uses, Types, Advantage, Procedure); Check the value of inductors (Introduction, Importance and uses, Types, Advantage, Procedure)	14+10+10	3Y**: Basic Electronics and Logic Circuit:** Introduction to electronic passive components (Resistors and potentiometers; Introduction, Classification and Demonstration of various types of Fixed Resistors and Variable; Resistors, Resistor Color Codes; Characteristics, Application and Demonstration of Thermistors, LDR. Inductive components; Introduction, Classification and Demonstration of various type of to Inductive Components and basic Construction; Types of Inductors used in electric & electronic circuit; Capacitors; Introduction, Classification and Demonstration of Capacitance and Capacitor and basic construction and units; Types of Capacitors and their application in Electrical & Electronic circuit)	4

Basics of Semiconductor (Introduction/properties; bonds in semi-conductor and its crystal structure; Semiconductor materials; Definition of energy levels, energy bands, energy gap; Hole and electron current; Types of semiconductor; Majority and minority charge carrier; Effects of Temperature on Conductivity of Semiconductor)	8				
Semiconductor Diode (PN junction; Depletion region, depletion layer, energy barrier potential; Introduction of PN junction biasing; PN diode- Definition, electric symbol and its applications; Reverse breakdown effects, Avalanche, Zener and Thermal breakdown; Introduction and applications of various diodes)	10	**Basic Electronics**: Semiconductor Diode (Introduction,Importance and uses, Types, Function), Biases (Importance and uses, Types, Advantage, Connection), DC power supply, V/I curve (Introduction, Importance and uses, Connection)	10		
Power Supplies (definition of rectifier and its components; Basic rectifier circuits, types; Rectifier circuits with filter; Overall block diagram of power supplies)	12	**Basic Electronics:**Rectifier Circuits (Introduction, Importance and uses, Types, Function, Connection, Advantage, Procedure)	5		

Transistors (Definition; basic classification; Bipolar Junction transistor; Working principle of NPN and PNP transistors, circuit characteristics; Configurations/Characteristics/applications of BJT; Demonstration of various types of Transistors, Transistor Rating and Interpretation of Transistor Data sheet; photo transistor, characteristics and application)	8	**Basic Electronics:** Transistor, biasing, data, amplification switching (Introduction, Uses/application, Types, Function, Advantage, Connection, Procedure)	14		
Field Effect Transistors (definition and basic classification; Junction field effect transistors; Metal Oxide Semiconductor Field Effect Transistor)	8				
Logic Gates (introduction to digital system; binary system; logic gates; types of logic gates; truth table; Boolean Algebra; Applications of logic gates)	10	**Basic Electronics:** Logic Gate Ics (Introduction, Importance and uses, Types, Function, Circuit diagram, Advantage, Procedure	7		
		Extra Contents		Extra Contents	

Grade 10: Industrial Installation and Maintenance (4 Cr)	128 (64 T+64 P)	Subject 1: Bench work Subject 2: Repair and maintenance Sub 3: Power Distribution System		Subject 1: Electrical installation I Subject 2: Electrical Engineering Drawing Sub 3: Electrical design and estimation sub 4: micro hydro power Sub 5: Electrical repair and maintenance sub 6: Power system operation and maintenance	
Fire and Safety Standards (Codes of Practice for Electrical Wiring Regulations; Electric Safety signs and Colors; Personal Protective Equipment; Firefighting and fire suppression equipment; Lock Out-Tag Out (LOTO) and Permit to Work (PTW)	6	**Electrical Installation**: Tools and equipment for Electrical installation (Introduction, Types, Importance & use, Safety)	14		

Distribution system (introduction, types; Electrical drawing symbols and legends; Single line diagram of Distribution Lines; Installation of Aluminum Conductor Steel Reinforced(ACSR) and Aerial Bundled Conductors; Definition and Need of Distribution Switchgear; Pole Mounted Substation; Jointing techniques and Terminations of Overhead and Underground Cables	14	**Electro-Technology**:Describe distribution system and service connection ((Comparison between overhead line and Underground cable, Domestic service connection and its components (feeder, distributor, service mains), Poles, insulaters, stay set and other accessories, Voltage ranges, Conductor spacing and sag))	3		

Industrial Wiring (concepts; Panel Boards and Distribution Boards; Cable Management System; Types of Cable Joints; Installation of Motors; Power Factor Improvement)	12	**Electrical Installation**: Perform board wiring (One way switching, Two way switching, Intermediate switching, Call bell circuit, Power and light socket/light indicator, Fuse and protective devices.); Perform wiring on brick wall (surface and concealed) Install (Main switch on , Install DB, KWH meter, Fan and fan regulator/dimmer, corridor lighting, lay the pipe in concrete slab on building)	68+38	In the 3 Years diploma, there are few sub topic on industrial wiring	

Earthing arrangements of Distribution System: (Earthing of Electric Equipment; System Earthing)	10	**Electrical Installation**: Earthing and lightning arrestor (Introduction Importance and application Types Process of earthing);		3Y: **Electrical Design and Estimation:** Earthing (arthing: Types of earthing and its application Types of earthing equipment Concept of 3-pin plug for high rating equipment Substation earthing: safe value of current through human body, soil resistivity, touch and step potential, grounding mat Various types of electrodes used for earthing Overvoltage: Cause and protection, Overvoltage due to lighting, LA Concept of instruments used for resistance measurement)	
Inspection, Testingand Maintenance of Industrial Installations: (Inspection of Industrial Installations; Testing of Industrial Installations)	8				

Three phase Induction Motor Controls : (Control of three phase induction motor using Drum Switches; Functions and applications of Motor Control Accessories; Power and control circuit diagrams of simple motor control system)	14	**Repair and Maintenance:** Repair and maintain AC three phase motors (Single phase, Balanced and Unbalanced)	42+49+49		
(Specification Grid has title for different subject (ie. Basic Electrical Engineering); but contents in it are okay)					
		Extra Contents		Extra Contents	
Grade 10: Utilization of Electrical Energy (4 CR)	128 (64 T+64 P)	Subject 1: Electro Technology Subject 2: ….........		Subject 1: Utilization of electrical energy Subject 2: ….........	

Introduction to electrical energy (Use of electrical energy; Advantage of electrical energy over other form of energy)	4	Non of the courses match with courses of TSLC	3	3Y: **Power Stations:** Generation of Electrical Energy (Advantage of Electrical energy in comparison with other form of energy Type of generations: base load plant, peak load plant, renewable power plant Typical layout for converting an energy into electrical energy Sources of energy to be converted into electrical energy; Hydro energy to electrical energy; Thermal energy to electrical energy; Renewable energy sources Economic of power generation: load factor, plant capacity factor, plant utilization factor, reserves capacity)	7

Illumination: (Electromagnetic waves light and heat; Illumination terminologies and laws; Luminaries and lamps; Glare; Illumination design)	28	**Electro-Technology**:Concept of illumination	1	3Y: **Utilization of Electrical Energy :** Illumination and general lighting system (Difference between heat & light energy emitted by hot body, wave spectrum, electromagnetic waves, Nature of light Terminology of illumination - light, luminous flux, luminous intensity, lumen, candle power, illumination, lux, candela, lamp efficiency, brightness or luminance, Glare, Stroboscopic effect, space-height ratio, utilization factor, maintenance factor, depreciation factor, absorption factor, reflection factor, solid angle, steradian Laws of illumination - Law of inverse square law & Lambert's cosine law Types of lamp: arc lamp, incandescent lamp, gaseous discharge lamp, LED lamp Types of lightning schemes - direct lighting, semi-direct lighting, semi-indirect lighting, indirect lighting, general lighting, factory lighting and street	20

				lighting. Design of lighting schemes - Illumination level, uniformity of illumination, colour of light shadows, glare, mounting height, spacing of luminaries colour of surrounding walls Methods of lighting calculations - watt per square meter method, lumen of light flux method Numerical problems)	

Industrial Utilization of Electrical Energy (Role of electrical energy in modern industry; Functions/types of drives; Selection of various types of drives; Methods of motors selection-factors to be considered and electrical characteristics; Various types of motors for particular service)	9	**Electro-Technology**:Explain utilization of electric power (Utilization of electrical energy, Agricultural sector, Industrial sector, Domestic sector, Commercial sector, Transportation sector)			
Traction System (Concept; advantages/disadvantages; Various system of Traction; Types of electrical vehicles fed from a separate system such as DC and AC supply system; AC and DC supply systems; Drive of tramways, trolley buses, electric trains; Braking of traction motor)	9	Non of the courses match with courses of TSLC		3Y: **Utilization of Electrical Energy:** Electric Traction (Different systems of tractions Systems of electric tractions Speed-time curves for a traction system General features of traction motors)	8
Power Factor (concept; causes and effect of low power factor; Advantages of power factor correction; Methods of improving power factor)	8	Non of the courses match with courses of TSLC			

Tariff (Introduction; objectives; calculation methods; types and application; tariff system in Nepal)	6	**Applied Math:** Tariff (Introduction, Ratio and proportion, Percentage, Formulae)		3Y: **Utilization of Electrical Energy:** Electrical load and tariff (Electrical load and tariff: definition and explanation; Load characteristics: load curves, load duration curves, load factor, connected load, maximum load, and demand factors, diversity factor etc. Types of tariff and applications; Simple tariff flat rate tariff block rate tariff two-part tariff max. demand tariff power factor tariff)	8

Grade 11: Electrical Measurement and Instruments (4Cr)	128 (64 T+64 P)	Subject 1: Electro Technology Subject 2: Applied maths		Subject 1: Electrical Instruments and Measurements Subject 2: Fundamental of electrical engineering Sub3: Fundamentals of Control system Sub4: instrumentation system Sub5: Basic Electonics and Logic Circuit Sub6: switchgear and protection	

Electrical Measuring instrument: Types (analog, digital); secondary instruments; features of indicating instruments; constructional details of indicating instruments; types of errors; principles of operating; classification of instrumnets based on principle of operation	16	**Electro-Technology:** Explain and apply electrical measuring instrument and measurement (Electrical measuring instruments; Basic Concept of different torques Construction and working principles of; Increasing range of measuring instruments)	20	3Y: **Electrical Installation I:** Introduction, descriptions, safety precautions, importance and application (Use and care of measuring instruments such as Ammeter, Voltmeter, Ohmmeter, etc) 1Y: **Workshop Practice I:** Measuring Instruments and Protecting Devices (Foot and meter/scale (Linear measuring instruments); Vernier caliper/caliper; Standard wire gauge; Feeler gauge/radius gauge; Micrometer/voltmeter; Miniature Circuit breaker (MCB); Fuses and fuse type; Check line with color chalk dust powder; Straightedge and line	2+1

Resistance measurement (classification, Ammeter and voltmeter method for the measurement of low resistance; Measurement of medium resistance; Megger construction and principle of operation for measurement of high resistance; Earth resistance meter, its construction, principle of operation, application; Application of earth resistance tester)	8	**Applied Math**: Fundamental of Electeicity (Law of resistance, Ohm's law, Kirchhoff's law, Resistivity, Resistance)		3Y: **Electrical Instruments and Measurements:** Measurement of Resistance, Inductance and Capacitance (Classification of resistance. Measurement of low resistance using ammeter and voltmeter method and Kelvin double bridge method. Measurement of medium resistance using Wheatstone bridge method. Measurement of high resistance and continuity using Megger) 1Y: **Workshop Practice I:** Measurement of current, voltage, resistance and power (Ampere meter; Volt meter; Ohm meter; Power meter/ Watt meter/Energy meter: Related numerical problems on circuits	6+4

Inductance and capacitance measurement (Inductor definition; Factors affecting inductance; Capacitor definition; Factors affecting capacitance; Measurement of the value of Inductance and Capacitance)	4	**Applied Math**: Calculate Inductance (R-L, R-C and R-L-C circuit, Impedance, Power factor, Phase angle, Active/reactive and apparent power; Capacitance (Coulomb's law, Charging and discharging, series/parallel capacitive circuit, Formulae)	11	3Y: **Electrical Instruments and Measurements:** Measurement of Resistance, Inductance and Capacitance (Maxwell's bridge for inductance measurement. De Sauty bridge and Schering bridge for capacitance measurement.)	2
Shunts and multipliers (introduction; characteristics and use; types of multi-range meters; applications of multi-range meters)	6	These content does not match with content of CDC		3Y: **Extension of measuring range of instruments:** hunts and Multipliers – use and characteristics.	2
Potentiometers (Introduction; principles of operation; measurement of unknown emf and resistance)	6	These content does not match with content of CDC		3Y: **Basic Electronics and Logic Circuit**: Introduction to electronic passive components (Introduction, Classification and Demonstration of various types of Fixed Resistors and Variable; Resistors, Resistor Color Codes; Characteristics, Application and Demonstration of Thermistors, LDR)	2

Instrument Transformers ((Introduction; Construction, working principle and functions; Measurement of high current using CT; Construction, working principle and functions of PT; Measurement of high voltage using PT))	8	These content does not match with content of CDC		3Y: **Electrical Instruments and Measurements :** Instrument Transformers (Current transformer – operating principle, construction, characteristics and application in measurements. Potential transformer – operating principle, construction, characteristics and application in measurements)	4
Power, energy and frequency meter ((connection diagram of single phase wattmeter; Method of power measurement in 3 phases circuits; Introduction of Var-meter, connection into electrical circuit, application of measurement of reactivepower; Single phase kwh-meter-construction, principle of operation, connection into electrical circuit; Frequency-meter-construction, operation and application)	8	These content does not match with content of CDC			

Non electrical quantities measurement by electrically measuring instruments ((Thermocouple-construction, principle of operation, application; Transducers (intro; type; components, application); Piezometer and its introduction and applications ; Illumination-meter)	8	These content does not match with content of CDC			
Grade 11: Electrical Installation, Estimation and Circuit Design	128 (64 T+64 P)	Subject 1: Electro Technology Subject 2: Repair and maintenance Sub3: Electrical installation		Subject 1: Electrical Design and Estimation Subject 2: Entrepreneurship Development Sub3: Electrical instruments and measurement Sub4: Utilization of Electric Energy Sub5: Electrical installation Sub6: Electrical Energy Audit Sub7: Computer Aided Design Sub7: electrical isnstallation II Sub8: Power Station	
General Principles of Estimation (estimate of quantities and cost analysis; Familiarization of catalogues; Recording of estimate; Determination of required quantity of material; Determination of cost of material and labor; Contingencies and overhead charges)	5	These content is not avialable in the course content of TSLC			

Illumination Engineering (Introduction; Laws; types of light sources; principles of lighting control; types os lighting schemes, purposes for designing of lighting schemes, types of industrial lighting system; methods of lighting calcualtion; desing procedure	20	These content is not avialable in the course content of TSLC			
Electrical Installation in commercial Buildings: (Electric supply system; Protection of electrical installation against overload, short circuit and earth fault; General requirement of electrical installation; Electricity rules; Design and calculation of the size of MDB and SDB; Design and calculation of number of lighting and power sub circuits; Guidelines for installation of fittings)	5	**Electrical Installation**: Tools and equipment for Electrical installation (ntroduction, Types, Importance & use, Safety)		There is a full coure on electrical installation in the 3 years diploma	
Out-door Lighting System Design (Introduction, Selection of Street Light Sources; Selection of Luminaries; Design Procedure of Street Lighting Scheme; Basic Floodlighting Effects; Selection of Floodlight Sources; Design Procedures)	8	These content is not avialable in the course content of TSLC			

Electrification of Industrial Buildings: (Wiring system; Selection of type of wiring and rating of wires & cables; Protective switchgears; Energy and power requirement for Lift, conveyorbelt and HVAC; Load Estimation; Selection of rating of main Panel Board and distribution board; Introductions to motor control Centers; Methods to draw single line diagram and design procedure)	8	These content is not avialable in the course content of TSLC			
Cables and Terminations (Cables; Cable construction; types; Cable Ratings; Installation of cable; Locating cable faults; Connectors and terminations)	5	**Power Distribution System**: Cable Joint (Introduction, Types, Importance and use, Components of cable joints, Cable joint material for overhead cable joint (Reychem), Cable jointing materials for underground (straight through joint), Process, Application, Use of trench, Process of trench)			
Distribution Substation of Industrial Plan (Introduction; classification; indoor substations; Out-door substations; Selection and location of site; Schematic diagram of distribution substation; Equipment and measuring accessories for substations and switch gear installation)	5	These content is not avialable in the course content of TSLC			

Earthing System for Commercial and Industrial Building: Introduction; System & Equipment Earthing; Point to be Earthed; Factors Influencing the earth resistance; Method of reducing earth resistance; Methods of Earthing; Earthing for Lightning Protection)	4	**Electrical Installation:** Earthing and install lightning arrestor (Introduction Importance and application Types Process of earthing)			
Emergency and Back-up Supply System for Industrial Plant (Battery Supply System; Emergency Supply System; Uninterrupted Supply for Critical Load; Introduction to AMF and ATSpannels)	4	These content is not avialable in the course content of TSLC			
		Extra Contents		Extra Contents	
Grade 11:Electrical Power System.	128 (64 T+64 P)	1. Electro-Technology; 2. Power Distribution System		Subject 1: Power System operation and maintenance	
Introduction to power system (Introduction; concept on per reactance and Per unit and its need; Schematic layout of power system; Single line diagram representation of power system)	8	None of these course content are avilable in the TSLC course content			
Economics of Generation (Fixed and operating cost of Electrical Energy Generated; Load curves, Base load, peak load and load Estimation; variable load problems; Inter-connection of power stationsand its advantages, concept of regional and national grid	10				

Power Plants (Introduction; Types)	18			3Y: Power Stations: Power Plants (Types of power plants Diesel power plant; Working principle and plant layout; Component and accessories; Manual and automatic starting; Operation and maintenance features; Hydro power plant (Working principle and plant layout; Dam, reservoir, forbay, spillway power cannel, tunnel, surge tank, penstock and other accessories; Turbines and their classifications; Sitting and sizing concept; History of hydro power plant in Nepal Thermal power plant (Basic working principle and plant layout; Component and accessories; Operation and maintenance features; Applications)	20

Power system operation: Normal and Abnormal conditions in power system; Relation between Voltage-Reactive power and its cause and effect; Relation between frequency-Active power and its cause and effect; Need for Synchronization, 3-lamp methods and Automatic Synchronizer for Synchronization and system restoration; Droop characteristics for power sharing in synchronous generators ; Hunting oscillation in generator, its causes and effects)	14			**3Y: Power Stations** : Introduction to Power System (Historical background of electricity generation (international and Nepalese scenario), early electrical system and voltage level Schematic layout modern power system: generation, substation, transmission, distribution units Need of voltage transformation Significance of standard frequency used in A.C. system)	4
Power factor improvement: (Definition; causes/disadvantages of low power factor; method of power factor improvement; advantages of power factor improvement	14				
		Extra Contents		Extra Contents	

Grade 11: Repair and Maintenance of Electrical Equipments	128 (64 T+64 P)	Subject 1: Repair and maintenanceSubject 2: ….........	0	Subject 1: Electrical repair and maintenance II Subject 2: ….........	
Scope and Organization of Electrical maintenance Department: Objectives; functions; organization work of the Department; office work of the department; Technical details for Maintenance work; Maintenance Record; Job card and log book; Machine History card; Permit To Work(PTW) system	4	These cousre content are not avaible in the TSLC coure content			
Maintenance and Testing of Electrical Equipment: Fundamentals of Maintenance; Importance; Concept of routine, preventive & breakdown maintenance; Preventive maintenance; Preventive maintenance of Earthing System; Preventive maintenance of Low Voltage Circuit Breakers; Preventive maintenance of Medium Voltage Circuit Breake; Preventive maintenance of Batteries; General procedure for Overhaul of motors; Testing of Electrical Equipment	6			There is one full course for testing and repring of essential domestic electrical equipment in th 3 Years diploma	15
Maintenance and Troubleshooting of Rotating Machines: Maintenance of Rotating Machines; Troubleshooting of Rotating Machines;	14				

Maintenance and Repair of Transformers: Fault Occurrence in the different parts of Transformers; Factors affecting the life of transformer-moisture, water oxygen, solid impurities, varnish, slackness of windings and dust; Check list of maintenance of power transformers; Preventive maintenance & routine maintenance of distribution transformer; Inspection & Maintenance Schedule for Distribution Transformers; Guide to Testing of Transformers; Routine Tests)	12	**Repair and Maintenance**: Repair and maintain single phase low voltage transformer (Introduction, Parts/components, Importance and use, Process, connection diagram, calculation of turns and size, Binding and installing Log book/ work report)		**3Y: Electrical Repair and Maintenance II:** Repair and maintenance of existing transformer (Review of repair and maintenance Constructional of transformers Components of transformer Possible fault and its diagnosis idea Test – continuity and body leakage Coil to coil leakage test)	4
Maintenance and Testing of Insulation (Classification of insulating materials; Measurement of Insulation Resistance; Factors affecting the life of insulating materials; Methods of cleaning of Insulation; Drying and Re-varnishing of Insulation; Insulating Oil and its Characteristics; Causes of deterioration of Insulating Oil; Types of Test on Insulating Oil; Purification of insulating oil; Protection of electrical insulation during the Hrs. of inactivity)	6				

Maintenance and Repair of Overhead Distribution Lines and Underground Cables : (Safety procedures for maintenance of Overhead lines; Maintenance of Overhead Lines; Faults in Overhead Lines; Procedure to be followed for Shut down in Overhead lines; List of Repairing Tools; Repairing of Overhead Lines; Faults in Underground Cables; Cable Jointing Techniques; Repairing of Cables)	10				
Rewinding of Single Phase Stator: Rewinding – stator of motor; Capacitor start motor, running and starting winding, capacitor centrifugal switch; Name plate data – power output voltage, frequency, connection; No of poles; No of turns in each coil; Type of winding; Slot insulation both size and kind; Rewinding- hand rewinding, form winding, skein winding; Connection of winding; Splicing and taping leads; Testing new winding; Backing and varnishing	12				
		Extra Contents		Extra Contents	

Grade 12:Switch Gear and Protection (4 Cr)	128 (64 T+64 P)	Subject 1: Electro Technology Subject 2: Repair and maintenance Sub3: Electrical installation		Subject 1: Electrical Engineering Drawing I Subject 2: Power Station Sub3: Switchgear and protection	
Faults in a Power System: Types; Unsymmetrical faults; Short circuits and their effects; Representation of fault conditions through Single Line Diagrams; Nominal ratings and abnormal conditions of electrical equipment	4	These cousre content are not avaible in the TSLC coure content			
Switchgear (Switchgear and Protection; Characteristics of Fuses; Types of fuse; Switches and their types; Contactors:LV Circuit Breakers: MCB and MCCB; Introduction to ELCB and RCCB and their applications	8	station and sub-station equipment (Switchgear,control and protection devices)		There is full couse in the 3 Years diploma on Switchgear and Protection	60
Current and Potential Transformers: Potential transformers; Current transformers;	6				
Circuit Breakers (Introduction; Differences between Isolator and Circuit breaker; Circuit breaker rating; Classification, construction, operating principles and applications of circuit breakers; Comparison between various types of circuit breakers)	12			**3Y: Power Stations: I**n the power station course, there is topic for circuits breakers.	

Protective Relays (Introduction; classificaiton; Electromagnetic relays; Basic Concept of Directional relays; Basic Concept of Distance relay and its types; Differential Protection; Introduction to Numerical Relays)	8				
Protection Schemes of Generators, Transformers, Motors and Feeders: Protection of alternators, stator faults, rotor faults, mechanical conditions, external faults - their reasons, effect and protections used; Protection of power transformer; Motor protection; Protection of feeders)	12				
Different Components of Sub-stations (Substations; Layout and single line diagram of a substation; Earthing of a substation; Concept of G.I.S. (Gas Insulated Substation))	4				

System Earthing and Overvoltage Protection: (Earthing:; Classification of Neutral or System earthing; Substation earthing; Definition of Overvoltage; Overvoltage protection; Overhead Earth wire)		**Electrical Installation**: Earthing and lightning arrestor (Introduction Importance and application Types Process of earthing)		**3Y: Electrical Design and Estimation:** Earthing (Earthing: Types of earthing and its application Types of earthing equipment Concept of 3-pin plug for high rating equipment Substation earthing: safe value of current through human body, soil resistivity, touch and step potential, grounding mat Various types of electrodes used for earthing Overvoltage: Cause and protection, Overvoltage due to lighting, LA Concept of instruments used for resistance measurement)	
Grade 12: Renewable Energy System	128 (64 T+64 P)	Subject 1: Micro hydropower Subject 2: ….........		Subject 1: Micro hydropower Subject 2: Renewable Energy technology	

Renewable sources of Energy; (Introduction; types of renewable sources of Energy; Features of Renewable sources of Energy; Role of Renewable sources for rural development; Current Status of different Renewable sources plants in context to Nepal)	3	These cousre content are not avaible in the TSLC coure content		In the 3 Years diploma, there is full course on Renewable Energy Technology	45
Introduction to micro hydro, its layout and civil construction works of MHP (Introduction; Classification of hydro power plant by head and capacity; Basic layout of a MHP plant; Introduce principle of power generation; Definition ofhead and discharge, Power equation; List Civil Components of MHP their constructional details and functions)	6			In the 3 Years diploma, there is full course on Micro Hydro Power	

Electro- Mechanical Component of MHP Plant (Turbines and valves; Synchronous generator; Induction (asynchronous) generator; Induction (asynchronous) generator; Speed Governing; Voltage control; Voltage control by VAR compensator)	15			3Y: **Micro Hydro Power:** Electro-mechanical component of MHP Plant (Turbines and valves: Types of turbine and their working principle, turbines for MHP plants, types of valve used in MHP plant. Synchronous generator: Basic construction and working principle, Excitation system. Induction generator: Basic construction and working principle, requirement of excitation capacitor. Coupling of turbine and generator - Direct coupling, Belt drive, Flywheel.; Speed Governing – Hydraulic mechanical governor, Electronic Load Controller (ELC) – Basic principle, types of ELC – AC voltage controller based ELC, DC chopper based ELC, Discrete resistance type ELC. Voltage control – AVR for synchronous generator, VAR compensator (Thyristor Switched Capacitor and Fixed Capacitor Thyristor Control Reactor) for induction generator)	13

Protection System for MHP Plant (Over speed protection; Over-load and short-circuit protection for generator; Over voltage and under voltage tripping system; Earthing for generator neutral and body; Protection of generator and ELC from lightening stroke; Single-line diagram of control panel with protection devices)	4			**3Y: Micro Hydro Power:** Protection System for MHP Plant (Over speed protection Over-load and short-circuit protection for generator Over voltage and under voltage tripping system Earthing for generator neutral and body Protection of generator and ELC from lightning strike Single-line diagram of control panel with protection devices)	6

Operation and Maintenance of MHP Plant (Starting up and shutdown procedure of MHP, training of operator; Regular maintenance procedure for intake weir, canal, desilting basin and spillway, forebay, penstock, turbine, valve and generator; Regular inspection and maintenance of control panel, switchgear and transformers)	4			**3Y: Micro Hydro Power:** Management, Operation and Maintenance of MHP Plant (Individual ownership management Community ownership-based management Plant operator – starting up procedure, shutdown procedure, training of operator. Regular maintenance of procedure for intake system, canal, desilting basin and spillway, forebay, penstock, turbine, valve, generator)	6

Introduction to Solar Energy, Solar Radiation, Orientation and Measurement (Introduction to Sun and its energy potential; Some common terms-Insolation, Solar Constant and Air Mass, Solar azimuth and Solar Elevation Angles; Spectral distribution, factors affecting spectral Distribution; Types of Radiation(direct, diffuse and reflected), Global Solar Radiation; Orientation and tilt angles for solar panels, latitude and longitude; Selecting optimum Tilt angle for solar panels; Pyranometer, its construction, working principle and calibration; Pryheliometer, its construction, working principle and calibration; Data logger, its function and block diagram	6			**3Y: Renewable Energy Technology:** Solar Energy (Solar radiation; Electromagnetic spectrur; Prediction of solar radiation Solar thermal energy; Domestic hot water system; Solar dryer; Solar distillation; Solar ponds; Swimming pool heating; Concentrating collectors; Flat plate collectors; Solar-electricity; Fundamental principle of photovoltaic conversion; Types of photovoltaic cells (mono-crystalline, poly-crystalline, thin film or amorphous cells); Solar module, energy storage battery, charge controller; Solar home system and solar water pumping Battery Management System Related Numerical (On Combination of Batteries)	12

Photovoltaic Cell and Performance Parameters (Ideal and practical PV cell, their equivalent circuits, IV and P-V curves; Effect of series and parallel resistance on PV cell characteristics; Fill factors and efficiency; Series and parallel connection of PV cells; Factors affecting solar cell performance; Effect of cell temperature and insolation on cell characteristics; Effect of humidity on output power; Shading and its impact on PV cell performance; Mitigation of shading impact)	6			**3Y: Renewable Energy Technology:** Solar-electricity; Fundamental principle of photovoltaic conversion; Types of photovoltaic cells (mono-crystalline, poly-crystalline, thin film or amorphous cells); Solar module, energy storage battery, charge controller; Solar home system and solar water pumping	
PV Technologies (Solar cells Generations; Crystalline silicon technology Monocrystalline and polycrystalline (m-Si, p-Si), advantages and disadvantages; Comparison between conventional and thin film Technology; Thin film technology (a: Si, CdTe, CIS), advantages and disadvantages)	4				

PV System, its Components and applications (Solar module/array, Various Components of a solar module; Connecting multiple solar modules; Commonly available solar modules in Nepal, Standard ratings; Array and its arrangement techniques; Mounts and mounting techniques; Storage devices/batteries, types of batteries lead acid; Battery connection techniques; Chargecontrollers-PWMandMPPTchargecontrollers; Inverters; Different topologies of PV system, their advantages and disadvantages; Inverter topologies; Centralized; Master Slave; String; Team-concept; Multi-String; Modular)	12				
Operation and Maintenance of Photovoltaic System (Regular cleanliness of solar panels; Checking battering overfill and prevent corrosion, testing of batteries; PV system safety measures during operation; PV module recycling and disposal; Operation and maintenance of Battery; Operation and maintenance of charge controller; Operation and maintenance of inverter)	4				
		Extra Contents		Extra Contents	
Grade 12: Electrical CAD Based Design	128 (64 T+64 P)	Subject 1: Engineering Drawing and Computer Application Subject 2: ….........		Subject 1: Engineering Drawing II Subject 2: ….........	

Overview about drawing (Introduction; Architectural drawing, structural drawing, services drawing, detail drawings etc; Types of building structure; Terminology used in drawing, Components/elements of building; Engineering symbols and conventional signs; Introduction to By-laws and codes)	3	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC		There are 2 courses for drawing ie Electrical Engneering Drawing I and Electrical Engneering Drawing II in the 3 years diploma	
Basic drawing/ drafting concept (Architectural Drafting-Lettering, Dimensioning lines, Title blocks, Office standards; Drafting conventions, Representation of different materials in section, Graphic symbols; Drafting and preparing foundation plans; Floor plans; Exterior elevations; Sections)	6	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC			
Introduction to the course and hardware (Overview of AutoCAD Release; Overview of a PC, peripherals e.g. printers and plotters, system settings and the Windows environment)	3	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC			
starting a new drawing/ opening an existing drawing (Setting up a drawing starting from scratch, using a Wizard, using and creating a template file, drafting aids; Opening an existing drawing; Screen layout, pull-down menus, screen icons, command line and dialogue boxes, status bar toggles; Setting preferences (Setting Units and Scale, managing drawing area by using MVsetup and Limits)	7	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC			

Drawing commands (Co-ordinate input methods (directive, absolute, relative and polar; Point, Lines, Polyline, Multiline ,Construction Lines; Circle, Arc, Ellipse, Donut; Polygon, Rectangle, Spline, , solids etc; Hatching; Text (multi-line & single line / true type fonts; Dimensions)	10	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC			
Modify commands (Object selection; Erase, Trim, Break; Copy, Mirror, Offset, Array; Move, Rotate, Scale, Stretch; Lengthen, Extend; Chamfer, Fillet)	8	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC			
Features (View tools; Layers concept, match and change properties; measure and divide; inquiry commands; Working with Block, W-block and External References)	8	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC			
Plotters and plotting the drawing	3	This course content completely match with the couse of TSLC. But couse content are not adavence as of CDC			

Use of AUTOCAD In Electrical Engineering Drawings (Various Electrical Symbols used in Domestic and Industrial Installation and Power System as per NEC, IEC and BISContractor Control Circuits; Design of circuit drawing of schematic diagram and power wiring diagram of following circuits, specification of contactors; Earthing; Line diagram of 11KV, 33KV , 66 KV and 132 KV substations; Schematic Diagram of Lighting and power circuits of conference room/Sports stadium/ Commercial malls/ Theatre etc using CAD and drawing sheets)	16	This course content completely match with the couse of TSLC. But course content are not adavence as of CDC		There is one full course on AutoCAD and drawing in the 3 Years diploma. The name of course is Computer Aided Design	
Grade 12: Power Transmission and Distribution	128 (64 T+64 P)	Electro-Technology; Basic Electronics; Repair and Maintenance		1: Transmission and Distribution of Electrical Power; 2: Electrical installation I	
Introduction (Electrical supply system; Comparison between AC and DC systems for transmission and distribution; Various systems of transmission of electrical power; Comparison between overhead and underground systems)	6	These coure content are not avaible in the coure content of TSLC			

Transmission Line Components (Selection of voltage for H.T and L.T lines; Economical voltage selection for transmission line using empirical formula; Mechanical terms of overhead lines; Main components of overhead lines; Types of line supports; Types of insulators; Types of conductor material and sizes from standard tables; Cross Arms; Guys and stays; Conductor configuration, spacing and clearances; Span length; Selection of insulators, conductors, earth wire and their accessories; Dampers and spacers; Right of way (ROW))	12	**Electro-Technology:** Explain transmission system (Importance of transmission system, Concept of tower, pole, hard ware and Insulators, Advantages of H.V. Transmission)			
Transmission line Parameters (Introduction; Line resistance; Skin effect; Line inductance; Bundled conductors; Proximity effect; Capacitance of transmission line; Transposition of three phase lines; Corona; Factors affecting corona; Advantages and disadvantages of corona; Methods of reducing corona effects)	14	These coure content are not avaible in the coure content of TSLC			

Cables (Introduction to cables; General construction; Cable conductors; Insulating materials for cables; Classification of cables; Comparison between O.H. Lines and underground cables; Selection of cables	8	**Power Distribution System:** Perform cable joint and Lay underground cable (Introduction, Types, Importance and use, Components of cable joints, Cable joint material for overhead cable joint (Reychem), Cable jointing materials for underground (straight through joint), Process, Application, Use of trench, Process of trench)	6		
Distribution System (Introduction: AC and DC distribution; Classification of Distribution systems; Primary distribution; Secondary distribution :Feeders, distribution and service mains; Radial, Ring and interconnected system of Distribution; Determination of size of conductors; Losses in distribution system)	14	These coure content are not avaible in the coure content of TSLC			
Voltage control (Necessity of voltage control, voltage fluctuation and problems; Methods of voltage control; Excitation control of alternator; Tap changing transformer; Shunt compensation-static VAR; Synchronous condenser)	10	These coure content are not avaible in the coure content of TSLC			