National School Curriculum

TVET CURRICULUM FRAMEWORK

Classes PP-XII

Department of Curriculum and Professional Development
Ministry of Education
Royal Government of Bhutan

“Your parents, relatives, and friends would be very proud of what you have achieved. At your age, to have completed your studies is your personal accomplishment. Your knowledge and capabilities are a great asset for the nation. I congratulate you for your achievements.

Finally, your capabilities and predisposition towards hard work will invariably shape the future of Bhutan. You must work with integrity, you must keep learning, keep working hard, and you must have the audacity to dream big.”

- His Majesty Jigme Khesar Namgyel Wangchuck

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Foreword

Technical and Vocational Education and Training (TVET) aims to equip learners with knowledge, skills and competencies required in particular occupations or more broadly in the labour market of today and tomorrow. High-quality vocational education and training systems that offer a strong work-based learning opportunity facilitate young people's easy transition to work and also contribute to reducing unemployment and supporting economic development of a nation. TVET is also a powerful means of empowering people to develop their full capabilities that enable them to seize social and employment opportunities, and increase the productivity of both workers and enterprises.

The role of education in social and economic progress has long been recognized. Education promotes functional and analytical ability and thereby helps in opening up opportunities for individuals and groups to achieve greater access to labour markets and better livelihoods. An educated labour force is essential if we are to meet the requirements of an efficient labour force for faster economic growth. Education is not only an instrument of enhancing efficiency but is also an effective tool of widening and augmenting participation and improving the overall quality of individual and societal life. Knowledge, skills and competencies are the engines of economic growth and social development of any country. Countries with higher and better levels of knowledge, skills and competencies respond more effectively and promptly to challenges and opportunities of globalisation.

The outputs of a well-structured TVET system have allowed countries such as Canada, Australia, Germany, Singapore and Japan to become global leaders in every aspect of their enterprises in a short period of time. The key strategy that these countries use is the promotion and marketing of TVET as an alternative to the more traditional mode of advancement and education. This is done by integrating competency-based training with academia both at the school and tertiary level.

Given the importance, the Royal Government of Bhutan has initiated to impart TVET in some vocational training institutes. The private agencies are also encouraged to offer the courses. Although some vocational courses are offered in secondary schools as optional subjects, the impact is not as desired. This has led to the need to revamp the TVET programme as an alternative pathway to education. The new approach includes sensitization programmes in the form of vocational clubs, pre-vocational orientation programmes and career guidance which are initiated right from primary level to higher secondary with proper guidelines, so as to create better awareness on TVET.

This would provide better sensitization and exposure to students and enable them to make informed decisions in choosing the right vocations/trades as optional subjects in their classes IX-XII levels of education. These courses are to be offered on a modular basis with the opportunity of credit transfer when they continue higher studies in vocational training institutes later. This opens up an alternative pathway to education which would provide opportunity for the students to undergo certain modules of vocational subjects in the schools and at the same time avail the opportunity to continue academic studies in the tertiary institutes. This option would produce graduates who will be more flexible, analytical,

adaptable, and multi-skilled in terms of responding to the changing needs in the job market. This is also intended to provide a sound foundation for learning TVET at primary, secondary and tertiary level and to develop required competencies as means of achieving lifelong learning.

Tashi Namgay
Director

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1. Introduction

1.1. Background

Technical and Vocational Education and Training (TVET) means education and training which provides knowledge and skills for employment. It comprises education, training and skills development related to a wide range of occupational fields, production, services and livelihood. The Department of Curriculum and Professional Development (DCPD), Ministry of Education (MoE) envisages that the TVET curriculum has a place in the mainstream education system, as it is the case in most of the education systems of the developed world. The formal Technical and Vocational Education and Training (TVET) actually began in 1965 at Don Bosco Technical School (DBTS), in Kharbandi (presently known as Rinchending) in Phuntsholing. Even after that, major curriculum reform was planned by the then Department of Curriculum Research and Development (DCRD), MoE in an attempt to make education relevant to the Bhutanese society through diversification of secondary education curriculum in the schools, which included the introduction of TVET.

As per the 'National Education Framework' developed collaboratively by the Royal Education Council (REC) and the Ministry of Education (MoE), it provides a pathway on integrating technical/vocational education in the mainstream school education curriculum and as elective subjects in higher classes (NEF, 2009; page 64).

With the collaborative efforts of the Ministry of Labour and Human Resources and erstwhile Department of Curriculum Research and Development, MoE, Vocational Curriculum has been introduced in the schools with the assistance from TTIs since 2011. After the first MoU that was signed between MoE and MoLHR in 2011, the second MoU was signed again in 2014, to improve technical/vocational courses. The technical/vocational courses offered by the TTIs/IZCs are adapted and redesigned and are offered in schools aligning to the 'Bhutan Education Blue Print' 2014-2024, which recommends up-scaling and diversification of TVET in schools through the provision of alternative pathways in schools and in the tertiary education systems, owing to the limited access to such courses, despite the growing demand for technical skills in the country.

The resolutions of the National School Curriculum Conference 2016, also strongly emphasised the need to upscale and deepen TVET. Accordingly, the TVET framework is developed from classes PP to XII, schools equipped with necessary resources and instructors trained. Tripartite MoU among REC, MoE and MoLHR was also signed in 2018 to implement the programmes collaboratively.

1.2. Rationale

We live in a globally competitive and knowledge-based economy where technological changes and concern for availability and sustainability of skilled manpower are the norms. For Bhutanese youth to function, compete, and excel in this 21stcentury environment, they require education and training opportunities that are current, engaging, and responsive to labour market needs. The TVET will provide students with the basic skills and competencies that will allow

them to transition successfully into the workplace, apprenticeship opportunities, post-secondary education, and their daily lives.

The World Bank's 2019 World Development Report on the future of work suggests that flexibility between general and vocational education, particularly in higher education, is imperative to enable workers to compete in the changing labour market. Many countries emphasise on the role of education in preparing learners effectively for the world of work. School- based TVET is viewed as an important component in promoting economic growth in general and addressing youth unemployment in particular.

Our country also continues to experience labour shortages in the skilled trades because of a few young people opting technical/vocational related careers. Therefore, TVET can serve to address those deficiencies in the skilled trades, make our youth globally competent and encourage them to explore career options in technical/vocational fields both within and outside the country. It can also provide the students with opportunities to apply their learning using an interdisciplinary and cross-curricular approach while at the same time integrating learning from their own personal experiences.

TVET like any other subjects also contributes to the 7 key competencies of the National School Curriculum Framework like spirituality and values, language, transversal competencies, enterprising and industrious, sustainable living, health and being, and digital competencies.

In a nutshell, the introduction of TVET with proper strategy and planning will allow students to either enter the job market or pursue higher studies through certification and recognition of their prior learning through credit transfer system, thereby enhancing their employment opportunities and addressing the national demand for skilled manpower. It can also help the children to generate interests and imbibe values related to technical/vocational subjects, and thereby inculcate positive

2. Goals

The introduction of TVET in the school education system will:

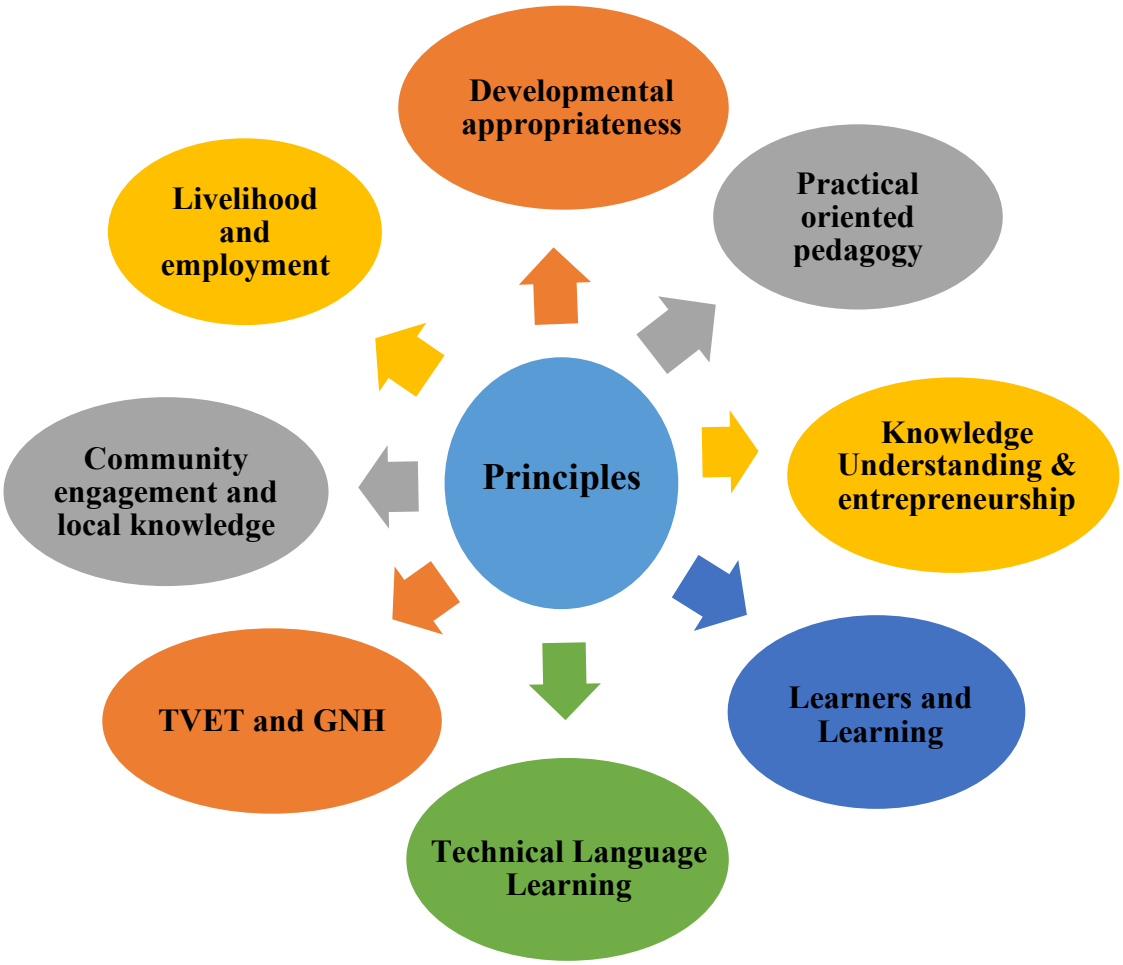
- Provide an alternative pathway of TVET to children through diversification of subjects that facilitate students to study the subjects of their interest and aptitude and build a foundation for higher technical/vocational training courses.
- Contribute to building skilled human resources to meet the national demand.
- Empower students to recognise their potential and pursue technical/vocational courses for gainful and self-employment, acquiring employability skills for an effective transition from school to work.
- Foster innovation, entrepreneurship, and nurture creativity in children to generate diverse opportunities for socio-economic development.
- Make the students understand the importance of becoming self-reliant and lifelong learners by acquiring the skills and knowledge needed in the future.
- Provide opportunities for students in understanding Bhutanese culture better through learning traditional arts and crafts through interdisciplinary approaches.
- Promote dignity of labour, work ethic and change the attitude towards technical/vocational professions, for nation's self-reliance.
- Inculcate a sense of professionalism at work guided by the occupational health and safety standards and practices.
- Groom the youth to be skilled in the world of work and to be globally competent.

3. Key Competencies

- Apply knowledge and skills in various situations (under guidance or with varying degree of responsibility)
- Carry out the tasks/processes in various contexts (known, familiar and unfamiliar contexts)
- Generate ideas and provide a range of responses or solutions to address the familiar/unfamiliar problems.
- Be disciplined in thought and action by being honest, diligent, and respectful without getting settled for complacency, mediocracy and indifference.
- Communicate effectively and market the products.
- Carry out new ventures meticulously and sensibly in collaboration with others.
- Exhibit multiple ideas and practical skills to succeed in life.
- Practise efficient use of resources contributing to sustainable living.
- Promote health and wellbeing through fulfilling business ventures that can bring positive change in the society.
- Keep abreast of the new technological development and mechanise the tasks for better outputs/products.
- Contribute to the 7 key competencies of the National School Curriculum Framework like spirituality and values, language, transversal competencies, enterprising and industrious, sustainable living, health and being, and digital competencies (Refer NSCF)

4. Guiding Principles

The development of the TVET curriculum framework is informed and guided by the following eight principles that transpired from the series of consultations with technical/vocational educators, professionals, and other stakeholders, and optimising the global trends.



This section takes each principle in turn and shows how the TVET Curriculum Framework is linked and guided by the following principles:

4.1. Developmental Appropriateness

The TVET Curriculum Framework emphasises on the development of an appropriate curriculum, based on the knowledge and skills about how children develop and learn. It is developed considering the following theories:

i. Stage theory of development proposed by Jean Piaget

During Key Stage 1, the TVET curriculum focuses on concrete everyday experiences for young learners through games, arts and crafts, drawing and model making. At Key Stage 2, higher technical/vocational related contents widen in terms of geometry,

measurement, shapes, scientific concepts, and safety practices. Similarly, the level progresses in a deeper manner, enabling the children to translate their learning to their daily living, gaining knowledge and skills required for semi-skilled and skilled manpower.

ii. Bloom's taxonomy of the cognitive, psychomotor, and affective domains to inform the writing of the key learning outcomes

For example, in the lower key stages, there is more focus on learning outcomes, which require learners to be able to name, identify, recall, and describe. At higher key stages the focus changes to learning outcomes where learners are required to explain, apply, synthesise, evaluate, and create. Similarly, the psychomotor (imitation, manipulation, precision, articulation, and naturalisation) and affective (receiving, responding, valuing, organising and characterising) domains are taken care of.

iii. The outcomes of the consultation meetings

At all the stages of development, key stakeholders' views were sought ensuring TVET to be developmentally appropriate and progressive for learners and that it fulfils the needs of the Bhutanese society.

4.2. Practical Oriented Pedagogy

The approach to teaching TVET must base on theories on learning by doing, experiential learning and psychomotor focused approaches. Unlike other subjects, TVET must focus on providing learning experiences that will not only enhance knowledge but also focus on psychomotor skills and the right attitude. The curriculum must clearly specify the amount of time and engagement allotted to practical field works in labs and workshops in a progressive manner as students climb up the levels. Emphasis must be to enhance creativity, innovation, and problem-solving skills through the curriculum.

Pedagogical approaches must be supported through well-facilitated classrooms, workshops with required standard tools, models, equipment, and training materials. ICT must be integrated as an integral part of technical/vocational subjects as and when feasible to enhance the effectiveness of teaching and learning.

The pedagogical approaches should be inclusive and be able to cater to the needs of differently abled students, irrespective of gender.

4.3. Knowledge, Understanding and Entrepreneurship

Every subject area of the school curriculum must contribute to the general education of the learners so that they are:

- factually well informed;
- capable of innovating and appreciating technical/vocational objects of aesthetic significance;
- endowed with rich social and cultural values;
- able to make informed decisions in choosing the career;
- motivated to learn, be innovative, creative, and enterprising;

- aware of the importance of dignity of labour;
- aware of occupational health and safety.

The aspiration of the TVET is to inculcate in the learners the notion of the dignity of labour, imbibe entrepreneurial skills, observe occupational health and safety, be divergent in thinking guided by the technical/vocational knowledge and skills in addressing the national challenges of the skilled manpower and developing professionalism in the technical/vocational field.

Therefore, the TVET has been developed not only to give the learners a strong foundation in different technical/vocational trades, but also to develop love for technical/vocational trades, inculcate a sense of professionalism and embrace job opportunities available in technical/vocational fields. So that they are factually well informed and become skilled.

Besides becoming skilled and contributing to the national economy, they can further broaden their scope by becoming globally competent through innovation, creativity b entrepreneurial skills.

4.4. Learners and Learning

Children learn from birth, and learning continues throughout their lives. They already bring an understanding of the natural world to the technical/vocational classroom. As soon as learners start to interact with the environment, they start developing personal beliefs, concepts, and skills about the world around them. Using their innate quality, past experiences and interests, children begin to unfold their potential in different areas of work. The differently abled children also display their hidden talents, if provided opportunity. Thus, every opportunity must be created to cater to their varied capabilities as per Howard Garner's multiple intelligence and provide avenues for them to exhibit their calibre and accordingly groom them to pursue the career of their choice.

Therefore, the learning environment and avenues are provided by offering various technical/vocational trades, clubs, and pre-vocational orientation programmes to the children of diverse abilities, in all classes, to tap their interest and potential, enabling them to pursue the occupations as per their interest, choice, and calibre.

4.5. Technical Language Learning

Scientific and technical terminology is vital for learners to effectively comprehend and communicate their ideas and study findings, to the class and the wider world while studying technical/vocational subjects.

Children should learn the technical terms focused on day-to-day technical/vocational practices through defining, describing, and explaining them and be able to interpret the drawing and design in practice.

The language of technical English must be considered as per developmental stages, directly using commonly understood terms with reasoning, note taking, listening, summarising and report writing along with the elements of grammar and vocabulary as per the following key stages.

It should focus on clear communication for situations where you may be using technical language and need technical writing and speaking skills. This will provide students with the skills and technical vocabulary to discuss a broad range of technical communication.

4.6. TVET and GNH

TVET with underlying principles of GNH should cater to holistic teaching and learning which will address socio-economic challenges and encourage learners to acquire necessary life skills to face it.

A curriculum infused with GNH promises more meaningful education and the four pillars of GNH can be incorporated, including but not limited to, in the following ways.

6.1 Sustainable and equitable socio-economic development

1. skilling for employment.
2. the use of resources in a sustainable approach.
3. Innovation and creativity.

6.2 Conservation of environment

1. Environmentally friendly practices
2. Green technical/vocational education and skills
3. Proper waste management
4. Use of renewable resources.

6.3 Good Governance

1. ethics such as integrity, commitment, dedication etc.
2. professionalism in delivering one's duty prescribed to occupational standard.
3. technical/vocational leadership such as leading, mentoring, coaching, supervising, managing etc.
4. participation in decision-making, consultation, teamwork, collaboration etc.

6.4 Preservation and promotion of culture

1. Unique traditional arts and crafts
2. indigenous know-how
3. community support and participation.

4.7. Community Engagement and Local Knowledge

TVET must optimise on the local human resources that are available to incorporate local knowledge on various trades of Technical/Vocational Education and Training (TVET). The community is an asset that can add greater value to TVET through collaboration with trade-specific local experts on carpentry, electrical, tailoring, masonry, and any other available areas to provide additional information on know-how and hands-on experience to the students.

Community engagement and local knowledge are about bringing the real-life component to the teaching of TVET and leveraging on it to further motivate and encourage students to see the possibilities of livelihood and income generation.

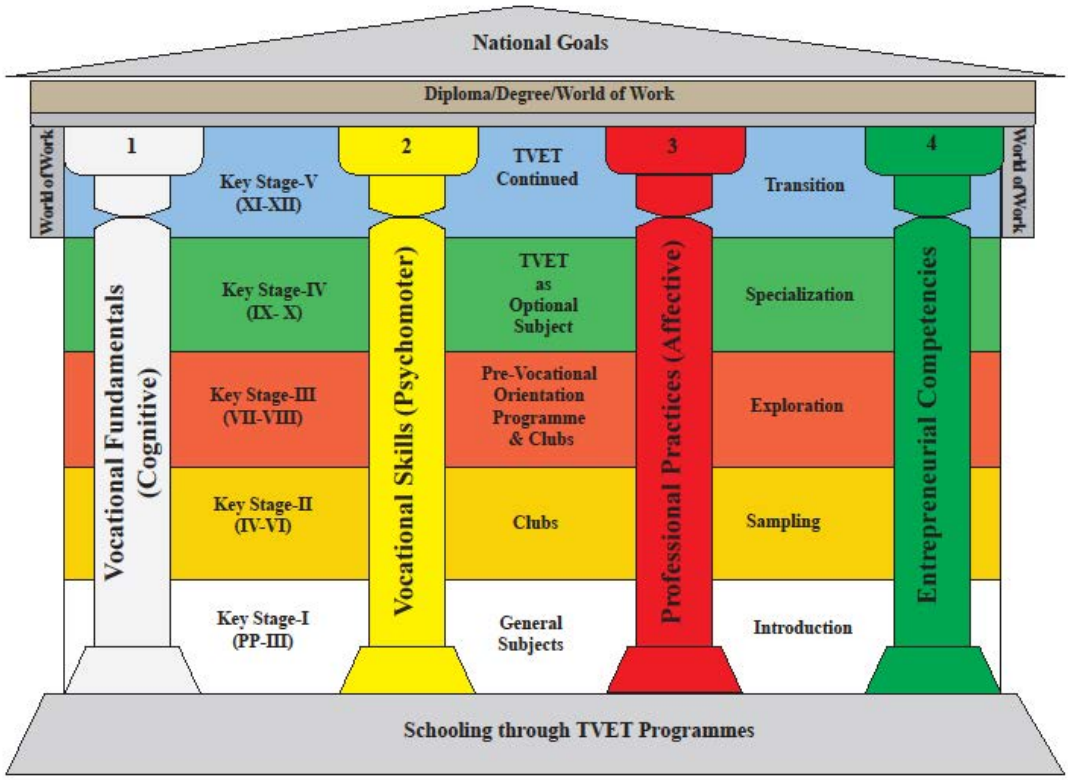
Projects and field trips aimed at the aforementioned end goals should become integral parts of TVET teaching in schools. It must also serve to preserve and promote traditional and local cultures.

In delivering the TVET curriculum, a networked approach based on collaboration with relevant stakeholders for sharing of resources, both material and human, including industry participation should be prioritised.

4.8. Livelihood and Employment

Technical/vocational Education must be guided by the current ground reality of skills mismatch. Therefore, priority must be given to skilling through the TVET to address the mismatch and enable students to avail livelihood and employment opportunities as per the changing socio-economic landscape. It should also support the interested students to pursue post-secondary technical/vocational education for national certification that will enhance their scope of employment.

The subject must incorporate entrepreneurial competencies to enable students to plan, start, and run a business in technical/vocational fields to boost self-employment and socio-economic development. A provision must also be created to those who have a passion to be technocrats, craftsmen, and artisans through programmes such as ATP, industrial attachment and recognition of prior learning (RPL) in collaboration with relevant stakeholders. As a result, this will provide a platform for lifelong learning.



5. Curriculum Structure and Organisation

5.1. STRANDS

Four strands have been identified as the main components of study right from pre-primary to class XII. Everyday teaching and learning will contribute towards the enhancement of the strands and as students progress to higher classes their understanding and competencies in each strand will accordingly get broadened.

5.1.1. Technical/Vocational Fundamentals (Cognitive)

Technical/Vocational Fundamentals are fundamental concepts and knowledge in both numeracy and literacy that are essential for students to learn to become an informed individual in the area of study. Students should be able to make relevant connections to cross-curricular areas, including but not limited to, sustainable development, entrepreneurship, innovation, and scientific literacy related to the subject matter.

5.1.2. Technical/Vocational Skills (Psychomotor)

Technical/Vocational Skills include the basic technological know-how in the field of study that will assist students to pursue post-secondary education in the subject and enhance their scope of employment in the related industries. This strand focuses on providing practical experiences that will help children develop and hone their required skill sets necessary to pursue higher studies or to join the job market.

5.1.3. Professional Practices (Affective)

Professional practices include values such as occupational health and safety, the dignity of labour, respect for work etc. that are expected to be taught and inculcated in the due course of studying the subject. This strand is expected to inculcate a positive attitude and appreciation towards technical/vocational professions.

5.1.4. Entrepreneurial Competencies

Students enhance their understanding of the professional practices related to the subject matter such as issues, the scope of employment and career possibilities through attachment, career counselling, projects and field visits so that school to workplace transition is smoothened. This will also help students make informed decisions on their career prospects and develop entrepreneurial competencies such as innovation, creativity, problem solving and planning.

Note: (Since 5.1 c and 5.1 d are process strands which are not vividly captured in the content, some programmes need to be carried out at different levels of classes. The entrepreneurship modules that are offered in TTI/IZC will be taught from classes IX to XII exploring various strategies)

5.2. Key Stages

The learning standards of the students will get enhanced as they progress to higher classes, not only through the study of technical/vocational subjects but also through the study of other subjects and programmes as described below.

5.2.1. Key Stage 1 (Classes PP-III): Introduction

This period is best described as the "symbolic mastery." What is important at this key stage is the opportunity to explore and to work intensively with materials that nourish human intelligence.

Through the study of subjects like English, Dzongkha and Mathematics, the students are introduced to basic terminologies, pictures, shapes and objects, patterns, measurements, names, sketching, colouring, and safety practices related to TVET. They will also explore their immediate surroundings and experience technical/vocational related activities through games, arts and crafts, drawing and model making.

5.2.2. Key Stage 2 (Classes IV-VI): Sampling

The children in this key stage develop a new quality of mind. They start to understand and get better perspectives on activities related to various trades. Therefore, the children are capable of thinking logically and are ready for a deeper understanding of different subject areas.
Through the study of subjects, students will learn higher technical/vocational related contents in geometry, measurement, shapes, scientific concepts, safety practices and values that are applicable to everyday occurrences and be introduced to concepts of jobs and job markets in social studies. Moreover, they will also be introduced to farming, industry and other technical/vocational opportunities.

In addition, the Technical/Vocational sampling programme can be conducted by making the students visit other clubs besides choosing one club. It will provide them with the opportunity to support sampling and improve their awareness and understanding of the scope of technical/vocational education. Through the implementation of guidelines for the technical/vocational clubs (at least one club in a year), students will get a basic hands-on experience about a few trades.

5.2.3. Key Stage 3 (Classes VII and VIII): Exploration

In the adolescent years, there are significant developments, mainly the movement towards abstract thinking, dealing logically with multifaceted situations and the development of meta cognitive abilities.

Through the study of various subjects, understanding of technical/vocational concepts will widen and relations can be drawn across different fields. Students will continue to associate their learning to the various concepts pertaining to technical/vocational education in a deeper manner and be able to translate their learning to their daily living.

The Pre-Vocational Orientation Programme (PVOP) will be organised (at least twice a year) in the form of talks by guest speakers, presentations, exhibitions, field visits etc. It is aimed at enhancing students' understanding of technical/vocational education with focus on various

trades like plumbing, masonry, carpentry, electrical, arts and crafts etc. The institution of pre-vocational orientation program at this stage is aimed at allowing them to further explore their interests in various technical/vocational areas and make decisions that may lead to pursuing higher education in certain technical/vocational trades. It will be followed by technical/vocational club formation in the areas of their interest. The students after joining technical/vocational clubs will be taught basic concepts with a marked difference of practical learning/hands-on learning experiences. In addition, the students can be equipped better to choose the technical/vocational subjects through career counselling.

5.2.4. Key Stage 4 (Classes IX to X): Specialisation

At this key stage, learners demonstrate significant developments in terms of logical and abstract thinking and are able to comprehend complex situations. For older children, education is for understanding, for mastering disciplines and for apprenticeship.

At this stage, students will be allowed to opt for a technical/vocational trade of their choice and interest as an elective subject for specialisation, through proper career guidance and counselling to let them make informed decisions. These students will start to study the subject in a deeper manner, utilising the allotted time round the year for two years to enhance knowledge, skills and professional competencies, which are expected to make them semi-skilled and job ready, if they choose to join the job market. The curriculum will be offered on a modular basis with the provision for credit transfer, should the students choose to continue their education in technical/vocational institutes and others.

The focus will be more on skilling through more practical classes. When they complete the course, students are expected to be competent to carry out basic skill work in their field of study. The common competencies can be further enhanced through career counselling, professional practices, occupational health and safety, innovation, creativity, entrepreneurial skills, and related values which will be covered in the modules.

5.2.5. Key Stage 5 (Classes XI and XII): Transition

At this key stage, the learners have well developed meta cognitive abilities and an understanding of the natural world around them. Children with young and maturing minds are moving towards making critical and informed decisions about career and becoming a productive member of society.

At this stage, students will continue to study additional modules on the trade they chose in stage 4 to specialise and develop skills to facilitate transition to the workplace or tertiary education programme. Similar to stage 4, students can transfer their modular credits for lateral entry to technical/vocational institutes and others, which would facilitate them to become skilled. This is allowed with the aim to reduce waste of time and resources for both the individual and the government, besides recognising their prior learning.

In addition, career counselling, professional practices, occupational health and safety, innovation, creativity, entrepreneurial skills, and related values incorporated in the modules can enable the graduates to further enhance their skills needed for the higher level of proficiency.

5.3. Key Stage Competency-based Standards (Strand wise)

The expected key learning standards of each strand for different key stages are mentioned below:

5.3.1. Strand 1: Technical/Vocational Fundamentals (Cognitive)

By the end of Key Stage 2 (Classes IV-VI) students should be able to:

- state what technical/vocational education is.
- observe different types of technical/vocational trades.
- identify basic tools and equipment
- state the uses/functions of different types of tools and equipment.
- explain the fundamental terminologies, pictures, shapes and objects, patterns, measurements, names and sketching related to trades.

By the end of Key Stage 3 (Classes VII-VIII) students should be able to:

- describe the nature of the work of different technical/vocational occupations.
- State the fundamental technical concepts involved in the particular trades.
- demonstrate one's potential required in different trades.

By the end of Key Stage 4 (Classes IX-X) students should be able to:

- describe the fundamentals of particular trades that they have opted to study.
- identify different types of tools, equipment and materials required for specific trades.
- state functions and working principles of tools, equipment, and other trade related resources.
- List basic occupational health and safety rules.
- Explain Personal Protective Equipment (PPE).
- Carry out the computation and conversion of measurement scales.
- interpret engineering drawings and symbols.
- Carry out basic calculations and estimations for particular task.

By the end of Key Stage 5(Classes XI-XII) students should be able to:

- Interpret theories of particular trade that they have opted to study in depth.
- identify additional tools, equipment and materials required for specific trades.
- explain the functions and working principles of additional tools, equipment, and other trade related resources.
- justify occupational health and safety rules.
- explain computation and conversion of measurement scales.
- carry out calculations and estimations for any given job.
- interpret basic engineering drawings and symbols.

5.3.2. Strand 2: Technical/Vocational Skills (Psychomotor)

By the end of Key Stage 2 (Classes IV-VI) students should be able to:

- experience different technical/vocational trades through clubs.
- get hands-on experience of basic tools related to different trades.
- develop basic models/products.

- follow safety rules to carry out activities.
- carry out measurement.
- draw sketches.
- explore their immediate surroundings and experience skill-based activities through games, arts and crafts, drawing and model making, colouring, etc.

By the end of Key Stage 3(Classes VII-VIII) students should be able to:

- get hands-on experience of different technical/vocational trades through PVOP and club activities.
- get hands-on experience of additional tools used for different trades.
- use safety rules to carry out activities.
- carry out measurement and conversion.
- draw basic technical symbols and drawings.
- demonstrate and produce additional products

By the end of Key Stage 4 (Classes IX-X) students should be able to:

- translate theoretical or scientific concepts to real world applications.
- make proper use of tools and equipment and carry out their maintenance.
- observe occupational health and safety and use PPE.
- carry out drawing and estimation of a particular task.
- draw basic engineering drawings.
- demonstrate competencies as per prescribed modules to fulfil all specified elements of competencies as per NCS.
- perform semi-skilled work in opted trades as per the national competency standard (NCS)

By the end of Key Stage 5 (Classes XI-XII) students should be able to:

- translate theoretical or scientific concepts to real world applications for additional modules.
- make use of the tools and equipment professionally and carry out their maintenance.
- apply occupational health and safety and use PPE.
- carry out drawing and estimation of a particular job.
- draw engineering drawings.
- demonstrate competencies in additional prescribed modules to fulfil all specified elements of competencies as per NCS.
- perform semi skilled work in opted trades as per the national competency standard (NCS) for additional modules.

5.3.3. Strand 3: Professional Practices (Affective)

By the end of Key Stage 2(Classes IV-VI) students should be able to:

- observe different kinds of technical/vocational occupations.
- justify the importance/aesthetic values of different technical/vocational occupations.
- show interest and enthusiasm in vocational trades.
- respect technical/vocational professions.

- enjoy learning by doing.

By the end of Key Stage 3 (Classes VII-VIII) students should be able to:

- justify that there are more employment opportunities in technical/vocational fields.
- appreciate the importance and aesthetic value of different technical/vocational occupations.
- Show love, respect, and positive attitude towards technical/vocational professions.
- demonstrate interest in technical/vocational knowledge and skills.
- implement safety rules.
- create and innovate designs and products.
- explain the values and importance of technical and vocational education.

By the end of Key Stage 4 (Classes IX-X) students should be able to:

- explain that technical/vocational education could open up employment and livelihood opportunities.
- appreciate the values of technical/vocational skills and traditional arts and crafts.
- value technical/vocational education as an alternative pathway for self-employment and meaningful economic activity.
- appreciate the roles of technical/vocational professions for the community and nation as a whole.
- develop a commitment to quality, integrity, enterprise, and dignity of labour.
- comply strictly to occupational health and safety.

By the end of Key Stage 5 (Classes XI-XII) students should be able to:

- justify that technical/vocational education could open up employment and livelihood opportunities and prepare mentally to transit to technical/vocational training institutes or workplace through lateral entry.
- explain the values of technical/vocational skills and traditional arts and crafts in preserving and promoting GNH and national goals.
- contribute towards fulfilling the national goal of self-reliance in a skilled workforce.
- justify technical/vocational education to be an alternative pathway for self-employment and meaningful economic activity for national prosperity.
- explain the contributions of the technical/vocational profession for the community and nation as a whole.
- show a greater commitment to quality, integrity, enterprise, and dignity of labour.
- comply strictly with occupational health and safety and be aware of the labour act.

5.3.4. Strand 4: Entrepreneurial Competencies

By the end of Key Stage 2 (Classes IV-VI) students should be able to:

- state opportunities in different technical/vocational trades and work environments.
- nurture innovation and creativity through learning by doing.

By the end of Key Stage 3(Classes VII-VIII) students should be able to:

- explain opportunities in different technical/vocational trades.

- state the requirements to become technical/vocational professionals.
- explain the work environment.
- demonstrate innovation and creativity through learning by doing.

By the end of Key Stage 4 (Classes IX-X) students should be able to:

- make an informed choice of the technical/vocational subject through career guidance and counselling.
- apply innovation and creativity in the technical/vocational field to carry out project work.
- gain experience of working in a real time environment for the particular trade.
- experiment problem solving through innovation and creativity in fixing minor issues related to their trade.
- explore work opportunities available in the locality for short term or long-term engagement.
- justify the importance of teamwork and collaboration.
- justify that through innovation and creativity, technical/vocational education can lead to individual and collective economic success.

By the end of Key Stage 5 (Classes XI-XII) students should be able to:

- prepare themselves for national certifications and lifelong learning for career progression.
- make an informed choice of the technical/vocational subject through internship and work experience.
- apply problem solving through innovation and creativity in a real work situation.
- work in a real time environment for the particular trade.
- capitalise on entrepreneurial knowledge and skills to start a business.
- collaborate with others and work in a team.
- explain that through innovation and creativity, technical/vocational education can lead to greater individual and collective economic success.

5.3.5. Class-wise Competencies (Annexure I to IX)

5.3.6. Learning Objectives, Core concepts (Chapters/Topics) and Process Essential Skills (Annexure I to IX)

The content areas with instructional hours, class-wise competencies and learning objectives for each class are specified for different chapters as per the trades that are offered. Since they differ from trade to trade, they are mentioned differently as annexures. They can be accordingly developed for new trades in future as per need

6. Teaching and Learning Approaches

Progressive education is focused on creating critical thinkers and inquirers who are active learners. According to John Dewey and other educators, progressive education must prepare learners for active participation in education. The focus of education must be creating critical thinkers and inquirers who are active learners. Most progressive education programs have the following qualities in common:

1. Blended learning- use of ICT and online resources
2. Use of 21st century skills.
3. Integration of entrepreneurship into education
4. Highly personalised learning with differentiated instruction accounting for each individual's personal needs and goals
5. Integration of community service and projects into the curriculum
6. Content based on knowledge and skills needed both in the present and future society
7. Emphasis on lifelong learning and social skills

Therefore, the TVET curriculum must be implemented following the progressive educational approaches:

Place Based Education

Place Based Education (PBE) is an approach that connects learning and communities to increase student engagement, academic outcomes, and community impact**.** PBE emphasises on "hands-on, real-world learning experiences" and gives students opportunities to connect to the culture, ecology, and economy of local places. The PBE concept is explained through ten principles – community as classroom, interdisciplinary learning, design thinking, connections, enquiry-based learning, real-world challenges, partnerships, learner-centred, content rich, and local to global. In the Bhutanese context, a place can relate to the ecology, economy, culture, and governance system of a place.

Competency Based Education

Competency Based Education (CBE) refers to systems of instruction, assessment, grading, and academic reporting that are based on students demonstrating that they have learned the expected knowledge and skills as they progress through their school education. The CBE concept is based on five design principle:

1. Learners advanced to higher-levels upon demonstration of mastery and not age. They are assessed on performance or the application of the skills;
2. Learning objectives are explicit and measurable and are shared with the learners. Students take responsibility for their learning, thereby increasing their engagement and motivation. Learning expands beyond the classroom.

3. Assessment is meaningful and supports positive learning experiences for students. Teachers assess skills or concepts in multiple contexts and in multiple ways. Focus is on student learning and not student grades.
4. Students receive timely and differentiated support.
5. Learning outcomes emphasise application and creation of knowledge. Learners are required to apply skills and knowledge to new situations to demonstrate mastery and to create knowledge.

Dimensions of Effective Pedagogy

The following are some of the dimensions of effective pedagogy that can be taken into consideration.

1. **Creating an enabling and conducive learning environment.**

Learning and development do not occur in a sequential linear fashion nor is one approach of learning equally effective to all, therefore, teachers should work towards setting up learning environments which appeal to children's interests and are relevant to their day-to-day experiences. The pedagogical approaches should create a positive psychosocial ambience where the individual learners feel included and safe. This may call for teachers to use differentiated instructions and a variety of teaching strategies to make learning accessible to all. Direct hands-on experiences encourage children for interaction, engagement, and involvement, which in turn, lead to improved understanding, recall and the development of mental representations. This approach supports children and young people as they move from concrete, tangible experiences to symbolic and abstract notions. As children develop their learning, dynamic learning environments provide a context for dealing with issues in depth and from multiple perspectives. Therefore, schools should create school environments that meet the educational, social, emotional, physical, and recreational needs of students.

2. **Making learning relevant and meaningful**

Relevance is a crucial factor in all kinds of learning. Students learn best when they feel that what they are studying is worth learning because it is meaningful and relevant to their lives. At the same time students must see the usefulness and potential application of this knowledge to their everyday lives. Effective teachers use pedagogies that connect classroom learning to the relevance of that learning in life, thus making learning more meaningful. Students should also be exposed to contexts and contents that are local, regional, and international which would be of relevance to them in their further education and career opportunities, thus making them part of the global village.

Learning can also be made relevant and meaningful by connecting prior learning to new learning. Learners come to the classroom with a broad range of pre-existing knowledge, skills, beliefs, and attitudes, which influence how they interpret and organise new information. How they process and integrate this information will, in turn, affect how they remember, think, apply, and create new knowledge. Since new knowledge and skill is dependent on pre-existing knowledge and skill, knowing what learners know and can do when they come into the

classroom or before they begin a new topic of study, can help us craft instructional activities that build off of student strengths and acknowledge and address their weaknesses.

Once prior knowledge and skill is assessed, there is a range of potential responses, depending upon the type of course, the uniformity of results, and the availability and type of supplemental materials and alternatives. Another way of making learning relevant and meaningful is by using pedagogies that facilitate cooperative, collaborative, and shared learning. Students learn best when engaging in shared activities and work in cooperation and collaboration with other learners. In shared activities everyone, including the teacher becomes a learner. Through this, learners share their opinions, remain engaged and take the ownership of their own learning.

3. **Fostering reflective practices**

Effective pedagogies leave rooms for learners to reflect on their learning process. One of the ways to do this is by using pedagogies that allow learners to participate in empowering activities in which they understand that learning is a process and mistakes are a natural part of learning. Teachers incorporate learner experiences, interests, and real-life situations in instructions. Reflection, particularly at the higher levels, can lead to greater self-awareness, which in turn is a first step to positive change. Taking time to reflect can help students identify approaches that have worked well, and in that way reinforce good practice and reflect on why some approaches did not work. Such metacognitive strategies can enable students to transfer learning to other disciplines and domains.

4. **Promote inquisitiveness**

Effective pedagogies should support and encourage learner's commitment to initiate and complete complex, inquiry-based learning requiring creative and critical thinking with attention to problem solving. Teachers orchestrate effective classroom discussion, questioning, and learning tasks that promote higher-order thinking skills. Teacher challenges learners to think deeply about problems and encourages and or models a variety of approaches to a solution. Teachers integrate a variety of learning resources with classroom instruction to increase learning options. Teachers clarify and share with students learning intentions/targets and criteria for success. Through these strategies students become, among others, self-directed learners. All pedagogical approaches that teachers use should be based on evidence of efficacy.

5. **Autonomy and flexibility**

The curriculum should be flexible to accommodate localised school-based innovation and creativity for effective implementation and delivery. It should allow flexibility to teachers to customise the curricular contents to local context and adopt different teaching strategies to develop their professional knowledge and apply them accordingly. Teachers should have the autonomy to come up with alternative assessment tools to assess learners' competencies as they learn and to inform future learning.

7. Assessment and Reporting

Educational assessment is the process of documenting, usually in measurable terms, outcomes of knowledge, skills, attitudes, and beliefs of the learners. This includes the processes of gathering and interpreting information about the progress of their learning. For the assessment to be valuable to individuals and organisations, the assessment must be accurate and objective. The learners should be well informed about what will be assessed and how it will be assessed. This makes the teacher's expectations clear to the learners to set appropriate learning outcomes. The teachers can play an important role in the learners' achievement by effectively monitoring their learning and giving them constructive feedback on how they can improve, and providing the necessary scaffolding for the needy learners as identified through the reliable assessment techniques and tools. Evidence based online assessment systems can be initiated wherever possible for transparency and proper record.

Assessment is an integral part of the teaching and learning process because it:

1. helps improve the learners' learning through the provision of constructive feedback and comments by teachers.
2. enables the teachers to incorporate varied teaching and learning strategies and resources to ensure quality learning in the learners.
3. empowers the learners to be self-reflective who monitors and evaluates their own progress.
4. assesses the strengths and weaknesses of the learners.
5. helps to diagnose the special needs of the learners.
6. provides evidence to grade and promote the learners to a higher level.
7. helps to inform parents and other stakeholders about the achievements of the learners.

The achievements and performances of the learners in VC are assessed on the following three domains:

- ***Technical/vocational knowledge***
- ***Technical/vocational skills***
- ***Technical/vocational values, attitude, and entrepreneurial competencies***

These are assessed through the following schemes of assessment:

7.1. Continuous Formative Assessment (CFA)

Formative assessment is used to provide feedback to teachers and learners, so that teaching and learning can be improved through the provision of regular feedback and remedial learning opportunities for the learners when needed. It also enables the teachers to understand what teaching methods and materials work best.

CFA facilitates the teachers to diagnose the learning needs of the learners and recognize the individual differences in learning. Through the constructive feedback provided, the learners

can understand their strengths and weaknesses. It also empowers them to be self-reflective who monitor and evaluate their own progress.

CFA should happen daily throughout the teaching-learning processes of the academic year. It is NOT graded, as it is to give continuous feedback to the learners.

The suggested techniques for CFA for the three domains are:

- ***Technical/vocational knowledge:*** *Class work, homework, written tests without grades, observations, immediate interaction with the students, etc.*
- ***Technical/vocational skills:*** *Demonstrations, model making, practical observation,* ***Question*** *and answer, homework, class work, etc.*
- ***Technical/vocational values, attitude, and entrepreneurial competencies:*** *Viva, Observations of students' behaviour and work, conduct, sense of responsibility and ownership.*

The tools identified for CFA are checklists and anecdotal records.

7.2. Continuous Summative Assessment (CSA)

Continuous Summative Assessment is another form of continuous assessment. It helps in determining the learner's performance and the effectiveness of instructions. This assessment helps to improve the learners learning and mandates the teachers to incorporate varied teaching strategies and resources to ensure quality teaching and learning. It empowers learners to be self-reflective learners who monitor and evaluate their own progress.

In CSA, the learner's performances and achievements are graded. This ensures active participation of learners in the teaching and learning processes.

The suggested techniques for CSA for the three domains are:

- ***Technical/vocational knowledge:*** *Project work, homework, case study, viva, and written tests.*
- ***Technical/vocational skills:*** *Project work, homework, skill test, observation, modular assessment.*
- ***Technical/vocational values, attitudes, and entrepreneurial competencies:*** *Observation of the learners' conduct, viva, assessment of students' behaviour, work and conduct, assessment of sense of responsibility and ownership.*

The main tools for CSA are rubrics and paper pencil tests.

7.3. Summative Assessment

Summative assessment consists of written exams, practical exams, and CSA all of which are carried out during both the terms.

Summative assessment (S) marks are summed up at the end of the year to determine the level of learning outcomes achieved by individual learners. The teachers use information gathered to grade the learners for promotion, to report to parents and other stakeholders.

The questions for the written examinations should cover all three domains of the curriculum, keeping in mind the learning objectives. Bloom's taxonomy should be referred to when designing test items to ensure proportionate distribution of questions across all levels of the cognitive domain.

Relevant and appropriate rubrics will have to be developed for assessing class work, homework, and project work for authentic assessment of all the strands.

Weighting for summative assessment (IX to XII)

2.3 Written = 10
2.3 Practical = 70
2.3 CA = 20

Sl. No.	Type		Weighting
1	Term I	40%	1. Written exam 5 %
			2. Practical exam 25%
			3. CA 10%
2	Term II	60%	1. Written exam 5%
			2. Practical exam 45%
			3. CA 10%
Total		**100%**	**A+B+C**

2.2.1 Details of CA

Continuous Assessment (10%)	
Continuous Assessment for the term I /II (10%)	**Weighting**
1. Class Work	3
2. Homework	3
3. Project Work	4

NB: BCSEA or the external examiner will administer the written and practical exams for terminal classes (Classes X and XII) and also consider the internal marks submitted by the school. The internal marks (20%) will consist of 5% theory and 15% practical while the

external marks (80%) will consist of 15% theory and 65 % practical as mentioned in the table below.

Classes X and XII assessment

	Internal (Home)	**External (BCSEA)**	**Grant Total**
Written/Theory	5%	15%	20%
Practical	15%	65%	80%
Total	**20%**	**80 %**	**100%**

Considering the credit transfer of the courses covered in the schools, the remaining courses/OJT can be undertaken at technical institutes. Accordingly, final assessment of NC2/NC3 will be carried out by relevant agencies under MoLHR.

Weighting for strands

1. Examinations	**Strand 1 (Concepts)**	**Strand 2 (Skills)**	**Strand 3 &4 (Values, attitudes and entrepreneurial competencies)**	**Total**
Written exam	80%	10%	10%	100
Practical exam	10%	80%	10%	100
Average	45%	45%	10%	100

2. Continuous Assessment	**Strand 1 (Concepts)**	**Strand 2 (Skills)**	**Strand 3 &4 (Values, attitudes and entrepreneurial competencies)**	**Total**
Theory 1. Class participation 2. Assignments (class /homework) **3.** Project /field trips (write up)	60%	20%	20%	100
Practical 1. Class **2.** Project	20%	60%	20%	100
Average	40%	40%	20%	100

8. Enabling Conditions

The school supported by relevant agencies must create an enabling environment that facilitates achievement of the objectives with which the subject of TVET is being introduced in the country. The environment along with textbooks as one of the tools will only help achieve the outcomes.

The context for the change will need the following:

	One Week				**One Year (32 weeks)**	**Remarks**
Class	Allotted periods (minutes)	Clubs (1 period)	Saturdays (2 hours)	Total	Total	
IX	50 x 3= 150	60	120	330	330x32 = 10560 minutes = 176 hours	National School Curriculum 132
X	”	”	”	”	176 hours	132
Total (IX and X)					**352 hours**	**264**
XI	50 x 6= 300	60	120	480	480 x 32= 15360 minutes= 256 hours	192
XII	40 x 6= 240	”	”	”	256 hours	192
Total (XI to XII)					**512 hours**	**384**
Total (IX to XII)					**864 hours (352+512)**	**648**

- School leadership that understands and believes the importance of preparing the students with knowledge, skills and abilities providing the required time. The suggestive time is as mentioned below.
- Learning environment built around a student in the constructivist approach that complements the textbooks and includes the infrastructure, workshop, tools, equipment, and training materials that are required to practice the knowledge and skills. The minimum resources required for each trade are worked out in annexures X-XVIII.
- Recruitment of trained instructors/trainers and their capacity building continually, working in collaboration with nearby TTIs/IZC.

- Assessment and evaluation that are designed to capture the learning outcomes in its various domains of learning and inform the learner and facilitators in real time to take corrective action.
- An inclusive environment that encourages equity in diversity in all aspects including gender, ability, culture etc.
- Partnerships of stakeholders, especially practitioners to enrich the learning experiences where the trainer/instructor might not have all the knowledge and experiences.
- Student leadership for engagement as active learners.

9. Cross Curricular Studies

Cross curricular studies refer to the interdisciplinary linkages, as no subject can be treated as stand alone. The learning experiences acquired in one subject must supplement and compliment other subjects. Teaching of school-based TVET could contribute to reinforce and enrich the knowledge, skills and values taught in other subjects just as the knowledge, skills and values acquired from other learning areas can be transferred to TVET. For example, acquiring knowledge and skills of Occupational Health and Safety, studying scientific/mathematical concepts, laws and principles can scaffold the students' acquisition of information and experiences expected in other subjects like Science and Mathematics. The entrepreneurship module can be directly related to the business plans and skills that are there in Economics, Commerce and Accountancy. Similarly, skills such as teamwork, time management, research work, innovation, technology competence are brought to the fore as are values such as ethics, respect, responsibility, aestheticism, industry, innovation including Gross National Happiness principles through the study of TVET.

GLOSSARY

ATP: Apprenticeship Programme
BCSEA: Bhutan Council for School Examinations and Assessment
CA: Continuous Assessment
CFA: Continuous Formative Assessment
CBC: Competency Based Curriculum
CBLM: Competency Based Learning Materials
CSA: Continuous Summative Assessment
DCPD: Department of Curriculum and Professional Development
DCRD: Department of Curriculum Research and Development
GNH: Gross National Happiness
ICT: Information and Communication Technology
IZC/CZC: Institute of Zorig Chusum/College of Zorig Chusum
MoE: Ministry of Education
MoLHR: Ministry of Labour and Human Resources
MoU: Memorandum of Understanding
NC: National Certificate (Level I, II and III)
NCS: National Competency Standard
PP: Pre-Primary
PVOP: Pre-Vocational Orientation Programme

REC: Royal Education Council
RPL: Recognising Prior Learning
SA: Summative Assessment
TTI: Technical Training Institute
TVE: Technical and Vocational Education
TVET: Technical and Vocational Education and Training

BIBLIOGRAPHY

Ministry of Labour and Human Resources. (2022). *TVET Management Information System*. Retrieved from National Competency Standards: https://mis.molhr.gov.bt/tvet/ncs

Ministry of Labour and Human Resources. (2022). *TVET Management InformationSystem*. Retrieved from Curriculum: https://mis.molhr.gov.bt/tvet/curriculum

MoLHR. (2013). *TECHNICAL & VOCATIONAL EDUCATION AND TRAINING POLICY FINAL DRAFT.* Thimphu: Ministry of Labour and Human Resources.

MoE. (2014). *Bhutan Education Blueprint 2014-2024.* Thimphu: Ministry of Education.

MoE. (2014). *National Education Policy (Draft).* Thimphu: Ministry of Education.

REC. (2012). *The National Education Framework.* Thimphu: REC.

Education, M. (2013). *Technical-Vocational Education Overview.* Monitaba: Manitoba Education.

Yeo, T. (n.d.). *Employment and TVET: Singapore's approach.*

Tasmania, U. o. (2014). *TASMANIAN CURRICULUM FRAMEWORK.* Tasmania: University of Tasmania.

Education, F. N. (n.d.). *Vocational education and training in Finland.* Finland: Finnish National Board of Education.

(n.d.). *Concept Note Vocational Education and Training in European Development Cooperation.* European Commission.

Boodhai, N. (n.d.). *CONCEPT PAPER FOR THE DEVELOPMENT OF A CARICOM STRATEGIC PLAN FOR VOCATIONAL EDUCATION SERVICES (CSME).* Trinidad & Tobago: Navneet Boodhai.

Goel, D. V. (n.d.). *TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) SYSTEM IN INDIA FOR SUSTAINABLE DEVELOPMENT.* India: Ministry of Human Resource Development, Government of India.

Sirohi, D. V. (n.d.). *TVET System in India: An Over view.* New Delhi: NEUPA.

Lee Ji-Yeon (KRIVET, K. (n.d.). *Vocational Education and Training in Korea: Achieving the Enhancement of National Competitiveness.* Korea: Director of Career Development Center, KRIVET.

Yek, T. M. (2006). *Technical Education 2020 in Singapore: Better Quality, Higher Performance and More Choices through a Market Approach.* Singapore: Institute of Technical Education.

Education, P. S. (2018). *TVET Country Profile: India.* India: Pandit Sunderlal Sharma Central Institute of Vocational Education.

(MoE), D. (2005). *ENGLISH Curriculum Framework Classes PP-XII.* Paro: CAPSD.

(DCRD)MoE. (2012). *Science Curriculum Framework PP-XII.* Paro: DCRD, MoE.

DCRD. (2014). *Values Education Framework Classes PP-XII.* Paro: DCRD.

ANNEXURE I: FURNITURE MAKING

Instructional hours

Class	Module	Chapter	Lesson	Theory (Hrs)	Practical (Hrs.)	Total Duration (Hrs.)
IX	**Module 1** Performing manual woodwork	**Chapter 1** Practising Occupational Health and Safety (OHS)	1. Apply Principles of 5s	1	2	17 hrs
			2. Apply OHS Practices	1	2	
			3. Use personal Protective equipment (PPE)	1	1	
			4. Maintain workplace and personal safety	1	2	
			5. Maintain tools and equipment safety	1	2	
			6. Use fire extinguisher	1	2	
		Chapter 2 Maintaining hand tools and portable power tools	1. Sharpen plane and chisel blades	2	6	40 hrs
			2. Sharpen saw blade	2	8	
			3. Grind hand tools	1	2	
			4. Make handle	0.5	2	
			5. Sharpen augur bit	0.5	2	

			6. Sharpen knife	0.5	2	
			7. Change portable planer blade	1	2	
			8. Change circular saw blade	1	2	
			9. Replace jigsaw blade	1	2	
			10. Replace router bit	0.5	2	
		Chapter 3 Carrying out basic woodwork	1. Perform cross cut	2	6	60 hrs
			2. Perform rip cut	1	6	
			3. Plane work piece	2.5	14	
			4. Chisel work piece	2.5	14	
			5. Drill hole	1	4	
			6. Sand work piece	2	5	
Engineering drawing				3	12	15 hrs
TOTAL				**30hrs**	**102hrs**	**132 hrs**
		Chapter 3 (Continued) Carrying out basic woodwork	7. Cut glass	1	3	12hrs
			8. Perform timber seasoning	5	3	

X	**Module 1** Performing manual wood work	**Chapter 4** Performing wood joints	1. Make butt joint	1	5	90hrs
			2. Make half lap joint	2	6	
			3. Make 'T' lap joint	2	6	
			4. Make mortise and tenon joint	2	8	
			5. Make miter joint	1	7	
			6. Make finger joint	2	8	
			7. Make dovetail joint	2	8	
			8. Perform sash joint	1.5	9	
			9. Make haunch joint	2	9	
			4.10 Make dowel joint	0.5	3	
			4.11 Perform basic estimation of materials	2	3	
		Engineering drawing		10	20	30 hrs
TOTAL				**34 hrs**	**98 hrs**	**132 hrs**
XI		**Chapter :1** Making table	1. Prepare table components	3	13	70 hrs
			2. Make table joints	4	16	
			3. Assemble table component	2	7	

	Module 2 Making table and chairs		4. Make drawer	1	9	
			5. Assemble drawer component	1	4	
			6. Perform finishing work	2	8	
		Chapter: 2 Making chair	1. Prepare chair components	3	14	50 hrs
			2. Make chair joint	3	15	
			3. Assemble chair component parts	2	13	
		Chapter: 3 Making chokdrom	1. Prepare chokdrom components	3	17	61 hrs
			2. Make chokdrom joints	4	20	
			3. Assemble chokdrom components	2	15	
		Engineering drawing		3	8	11 hrs
Total				**33hrs**	**159hrs**	**192 hrs**
	Module 3 Making bed and Sofa frames	**Chapter: 1** Making bed	1. Prepare bed components	3	18	60 hrs
			2. Make bed joints	5	20	
			3. Assemble bed components	2	12	

XII		**Chapter: 2** Making sofa frame	1. Prepare sofa components	5	23	86hrs
			2. Prepare sofa joints	7	32	
			3. Assemble sofa components	3	16	
	Module 4 Making storage cabinet	**Chapter:1** Preparing cabinet	1. Prepare cabinet components	1	5	23hrs
			2. Make cabinet joints	2	9	
			3. Assemble cabinet components	1	5	
		Chapter: 2 Making shutter joints and assemble parts	1. Prepare shutter components	1	6	23 hrs
			2. Make shutter joints	2	8	
			3. Assemble shutter	1	5	
			Total Hrs.	**33hrs**	**159 hrs**	**192 hrs.**
			Grand Total	**130**	**518hrs**	**648 hrs.**

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Practise OHS procedures in any task for safety
2. Maintain hand tools and portable power tools for better performance
3. Apply basic woodwork techniques to produce different products
4. Make appropriate use of PPE

5. Maintain workplace safety in our day-to-day life
6. Make use of the standard procedure to operate the fire extinguisher
7. Sharpen plane blade to achieve smooth cutting
8. Sharpen saw blade to improve its efficiency
9. Grind any tool using a grinding machine
10. Make handle of any tool
11. Sharpen any augur bit for better performance
12. Sharpen any knife for better performance
13. Change portable planner blade as required
14. Change circular saw blade as required
15. Replace jigsaw blade as required
16. Replace router bit as required
17. Perform cross-cut techniques to produce different products
18. Perform rip-cut technique to produce different products
19. Apply planning techniques to produce different products
20. Identify the grains of any wood
21. Apply chiselling technique to produce different products
22. Operate drilling machine using different bits in different areas as per requirement
23. Carry out sanding work in any product

CLASS IX COMPETENCIES-ENGINEERING DRAWING

1. Carry out basic engineering drawing
2. Handle the drawing instrument properly
3. Layout the drawing sheet as per the required dimension
4. Interpret signs and symbols as required
5. Draw different types of lines as per their application
6. Draw letters and numbers as per the given scale

2) CLASS X COMPETENCIES

1. Use different types of wood joints in making new products
2. Cut glass as per the job requirement (desired shapes and sizes)
3. Perform timber seasoning for making any product
4. Use moisture meter to measure moisture content in any wood

5. Interpret drawing of any joints in woodwork
6. Use butt joint to make any product
7. Use a half-lap joint to make any product
8. Use mortise and tenon joint to make any product
9. Use miter joint to make any product
10. Use a finger joint to make any product
11. Use a dovetail joint to make any product
12. Use sash joint to make any product
13. Use haunch joint to make any product
14. Use dowel joint to make any product
15. Carry out estimation of the materials using BSR

CLASS X COMPETENCIES-ENGINEERING DRAWING

1. Draw isometric blocks and orthographic projections
2. Convert the drawing scales as per the drawing ratios
3. Draw isometric blocks as per the given dimension in standards procedures
4. Draw orthographic projections to give an accurate overall representation of an object

3) CLASS XI COMPETENCIES

1. Apply techniques of making table, chair and chokdrom for other products
2. Make a table with a different design using a circular saw machine, surface planer machine, and thicknesser machine
3. Make table using different joints
4. Assemble table components to produce or repair
5. Make a drawer of a different design
6. Perform finishing work for any product
7. Use the components to make chairs of a different design
8. Use different joints to make a new chair/repair an old chair
9. Use the components to make chokdrom of a different design
10. Use the joints to make a chokdrom of different designs
11. Assemble the components to make a new chokdrom

CLASS XI COMPETENCIES-ENGINEERING DRAWING

1. Draw objects before carrying out the tasks

2. Draw stools of a different design
3. Draw a chair of a different design
4. Draw a table of different designs

4) CLASS XII COMPETENCIES

1. Apply techniques of making bed, sofa, and storage cabinet for other products
2. Prepare the components to make a new bed/repair a bed
3. Use bed joints to make beds of different designs
4. Assemble the components to make a new bed/repair a bed
5. Prepare sofa frames of different designs using a lathe machine
6. Use different joints to make a sofa using a band saw machine
7. Assemble the components to make a new sofa/repair a sofa
8. Prepare cabinets of different designs
9. Use different joints to make the cabinet
10. Assemble the components to make a new cabinet/repair a cabinet
11. Prepare shutter components of different designs
12. Use different joints to make a shutter
13. Assemble the components to make a new shutter/repair shutter
14. Select laches, knobs, tower bolt, magnetic door catcher, and handle according to the job requirement

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	Core concepts (Chapters/Topics)	Class
	MODULE 1: PERFORMING MANUAL WOOD WORK	**IX**
	Chapter 1: Practising Occupational Health and Safety (OHS) and Personal Protective Equipment (PPE)	
1. Define 5S 2. State the purposes of 5S	**Apply principles of 5S**	

3. Explain the Principles of 5S 4. Define OHS 5. State the importance of OHS 6. Explain the rights of employee 7. State the main causes of accidents 8. State the safety rules		
9. Define PPE 10. State the importance of PPE 11. List the categories of PPE *12.* Ensure *to use appropriate PPE* *13. Ensure safe disposal of damage PPE* *14. Ensure not to use defective and damaged PPE*	**Use PPE**	
1. Define safety precaution 2. List different types of safety 3. Explain workshop and personal safety 4. State the importance of maintaining workplace and personal safety 5. Explain the importance of safety signs and symbols 6. Explain the emergency exit 7. Describe the layout of the workshop 8. *Ensure to follow OHS procedures* 9. *Ensure to keep the workshop clean* 10. *Ensure to ring the alarm bell before the accident spreads over* 11. *Ensure to display safety signs and symbols* 12. *Ensure to use appropriate PPE in workplace* 13. *Ensure to avoid horseplay at workplace*	**Maintain work place safety**	

14. *Ensure to avoid smoking and eating inside the workshop* 15. *Ensure to avoid working under influence of alcohol*		
1. Explain tools and equipment safety 2. State the importance of maintaining tools and equipment safety 3. List dos and don'ts of tools and equipment 4. *Ensure all the tools are in workable condition* 5. *Ensure to keep tools clean and dry, and tore them properly after use* 6. *Ensure to operate the machine when instructed* 7. *Ensure to refer manual prior to operation of tools and equipment*	**Maintain tools and equipment safety**	
1. Define fire extinguisher 2. Label the parts of fire extinguisher 3. Explain the types of fire 4. List types of fire extinguishers 5. State the method of combating/extinguishing fires 6. *Ensure to read the instructions provided on the fire extinguisher* 7. *Ensure appropriate use PPE*	**Use fire extinguisher**	
Chapter 2: Maintaining hand tools and portable power tools		
1. List the types of plane and chisel blade 2. Identify the parts of plane 3. Identify the types of plane blade 4. State the function of the plane and its parts	**Sharpen plane/chisel blade**	

5. Explain the purpose of soaking oil stone in water 6. State the purpose of maintaining sharpening angle range 7. *Ensure safe while checking the sharpness of the plane or chisel blade*		
1. State the function of saw 2. List the types of saws 3. List types of saw setting tools 4. Explain the method of sharpening and setting saw teeth 5. *Ensure safe handling of saw* 6. *Ensure appropriate use of PPE*	**Sharpen saw blade**	
1. State the function of a grinding machine 2. List the safety precaution 3. State the function of safety guard 4. Explain the working principle of grinding machine 5. *Ensure to follow safety precautions* 6. *Use to maintain cutting edge at an angle of 25° approximately* 7. *Ensure to appropriate use of PPE*	**Grind hand tools**	
1. Identify the materials used for handle 2. State the purpose of handle 3. Explain the method of fitting handle *4. Ensure proper disposal of waste* 5. *Ensure safe handling to tools*	**Make handle**	
1. Define augur bit 2. Identify the size of auger bit 3. Label the parts of auger bit 4. State the function of auger bit	**Sharpen augur bit**	

5. *Ensure not to change the angle of the bevel from the originally sharpened bit* 6. *Ensure to avoid lifting the brace end to prevent the damaging of bevel edge* 7. *Ensure safe handling of sharpen bits* 8. *Ensure appropriate use of PPE*		
1. Define knife 2. Identify the types of knives 3. *Ensure safe handling of knife*	**Sharpen knife**	
1. State the portable planer safety precaution 2. State the working principle of planer machine 3. State the function of portable planer 4. State the application of planer machine ***5. Operate portable planer machine*** 6. *Ensure to follow safety precautions* 7. *Ensure safe handling of power tools* 8. *Ensure appropriate use of PPE* 9. *Ensure the blade is aligned with the notch of the cutter block*	**Change portable planner blade**	
1. State the function of circular saw machine 2. List the parts of circular saw machine 3. State the type of saw blades 4. State the application circular saw machine ***5. Operate circular saw*** 6. *Ensure appropriate use of PPE* 7. *Ensure that the stock is well supported to prevent getting the kerf close,*	**Change circular saw blade**	

binding the blade, and causing a kickback 8. *Ensure to support thin materials near the cut* 9. *Ensure to adjust the depth of cut, so that the ends of three teeth are extended to ¼" (6 mm)* 10. *Ensure to check the base and angle adjustments are tightened before using a saw* *11. Ensure to let the blade touch the workpiece only after the machine is switched on* *12. Ensure to hold the machine by both hands if two handles are provided* *13. Ensure the saw blade has stopped running before resting it on the workbench* *14. Ensure to unplug the power cable while making adjustment or to changing blade* *15. Ensure to use sharp blades and keep the blade guard functional* *16. Ensure to avoid overextending or overreaching and losing balance while using the portable circular saw*		
1. State the function of jig saw machine 2. Label the parts of jigsaw machine ***3. Operate jigsaw machine*** *4. Ensure to cut the workpiece at normal speed* 5. *Ensure safe handling of power tools* 6. *Ensure appropriate use of PPE*	**Replace jigsaw blade**	
1. State the function of router machine 2. State the types of router bit	**Replace router bit**	

3. Use router machine *4. Ensure to cut the workpiece at normal speed* 5. *Ensure safe handling of power tools* 6. *Ensure to use PPE*		
Chapter 3: Carrying out basic wood work		
1. Define crosscut saw 2. State the purpose of cross cutting 3. *Ensure safe handling of tools* 4. *Ensure safe use of hand saw* 5. *Ensure appropriate use of PPE*	**Perform cross-cut**	
1. State the function of rip cut saw 2. State the application of rip cut saw 3. *Ensure safe handling of tools* 4. *Ensure safe use of hand saw* 5. *Ensure appropriate use of PPE*	**Perform rip cutting**	
1. Define plane 2. State the purpose of planing 3. List the types of marking tools 4. State the preventive measure for distortion of work piece 5. State planing methods 6. Explain the grains and textures of wood 7. *Ensure safe handling of planes* 8. *Ensure to place the plane side wise* 9. *Ensure appropriate use of PPE*	**Plane work piece**	
1. State the functions of chisel 2. Identify the different types of chisels 3. *Ensure safe handling of chisel* 4. *Ensure appropriate use of PPE*	**Chisel work piece**	

1. Define drilling bit 2. List the sizes of drill bit 3. State the purpose of drilling 4. Explain the types of boring tools 5. Explain drilling methods ***6. Operate drilling machine*** 7. *Ensure safe handling of tools and equipment* 8. *Ensure appropriate use of PPE*	**Drill hole**	
1. Define sanding 2. State the purposes of sanding 3. Explain types of sand paper 4. Explain the types of sand paper grits 5. State the methods of sanding 6. State the function of portable power sanding machine ***7. Use portable power sanding machine*** 8. *Ensure safe handling of tools* 9. *Ensure to follow safety precautions* 10. *Ensure appropriate use of PPE*	**Sand work piece**	
Chapter 3: Carrying out basic wood work		**X**
1. Define glass cutter 2. State the function of glass cutter 3. State the types of glass 4. State the purpose of applying kerosene while cutting glass 5. *Ensure proper handling of glass* 6. *Ensure proper disposal of waste glasses* 7. *Ensure to use PPE* 8. *Ensure to cut glass without breaking any edges*	**Cut glass**	

1. Define wood 2. Classify types of woods 3. State the characteristics of wood 4. Explain the spices of trees in Bhutan 5. State the properties of wood 6. Explain cross section of timber 7. Explain conversion of timber 8. Explain preservation of timber 9. Explain timber defects 10. Define timber seasoning 11. Explain purpose of seasoning 12. State the types of seasoning 13. Explain the methods of seasoning 14. Explain moisture content in the timber ***15. Use moisture meter*** *16. Ensure proper stacking of timber* *17. Ensure to work in team* *18. Ensure appropriate use of PPE*	**Perform timber seasoning**	
Chapter 4: Performing wood joints		
1. Define wood joints 2. Explain the purpose of butt joint 3. State the application of butt joint 4. State the requirement of wood joint 5. Explain the types of butt joint *6. Ensure safe handling of hand tools* *7. Ensure appropriate use of PPE*	**Make butt joint**	
1. Define half lap joint 2. State the purpose of half-lap joint 3. State the types of half lap joints 4. Interpret drawing 5. *Ensure safe handling of hand tools*	**Make half lap joint**	

6. *Ensure appropriate use of PPE*		
1. Define "T" joints 2. State the application of "T" joint 3. State the types of "T" joint 4. *Ensure safe handling of hand tools* 5. *Ensure appropriate use of PPE*	**Perform "T" Joint**	
1. State the application of mortise and tenon joint 2. State the types of mortise and tenon joint 3. Interpret drawing 4. *Ensure safe handling of hand tools* 5. *Ensure appropriate use PPE*	**Perform mortise and tenon joint**	
1. Define miter joint 2. State the application of miter joint 3. Explain the types of miter joint 4. Explain the characteristics of miter joint 5. Interpret drawing 6. *Ensure safe handling of hand tools* 7. *Ensure appropriate use of PPE*	**Make miter joint**	
1. List types of finger joints 2. State the application of finger joint 3. Interpret drawing *4. Ensure safe handling of hand tools* 5. *Ensure appropriate use of PPE*	**Make finger joint**	
1. Explain the characteristics of dovetail joint 2. List the types of dovetail joint 3. List the application of dovetail joint 4. Interpret drawing *5. Ensure safe handling of hand tools* 6. *Ensure appropriate use of PPE*	**Perform dovetail joint**	
1. Define sash joint	**Perform sash joint**	

2. Explain the purpose of sash joint 3. State the characteristics of sash joint 4. State the application of sash joint 5. Interpret drawing *6. Ensure safe handling of hand tools* 7. *Ensure appropriate use of PPE*		
1. State the purpose of haunch joint 2. State the application of haunch joint 3. Interpret drawing 4. *Ensure safe handling of hand tools* 5. *Ensure appropriate use PPE*	**Make haunch joint**	
1. State the application of dowel joint 2. State the purpose of dowel plate 3. *Ensure safe handling of hand tools* 4. *Ensure to use PPE*	**Make dowel joint**	
1. Define estimation and costing 2. Sate the types of estimation and costing 3. Explain the purpose of estimation through Bhutan Schedule of Rate (BSR) 4. Estimate basic cost of wooden component product 5. *Ensure correct dimensions are extracted from the drawings* 6. *Ensure correct code and estimation are executed*	**Perform basic estimation of materials**	
MODULE 2: MAKING TABLES AND CHAIR **Chapter 1:** Making table		XI
1. Define table 2. Interpret drawing 3. State the components of table 4. State the function of the circular saw machine	**Prepare table components**	

5. Label the parts of circular saw machine 6. State the purpose of surface planer machine 7. Label the parts of surface planer machine 8. State the functions of thicknesser machine 9. Label the parts of thicknesser machine ***10. Use surface planer machine*** ***11. Use thicknesser machine*** ***12. Operate circular saw machine*** ***13. Operate planer machine*** *14. Ensure safe handling of machines* 15. *Ensure to use PPE*		
1. State the types of joint 1. State the purpose of pedestal drill machine 2. Label the parts of pedestal drilling machine 3. State the function of mortise machine 4. Label the parts of mortise machine ***5. Use pedestal drilling machine*** ***6. Use mortise machine*** *7. Ensure proper handling of machines* *8. Ensure to use appropriate PPE*	**Make table joints**	
1. State the purpose of nail and screw 2. Types of nails 3. Types of screws 4. State the purpose of clamp 5. State the types of clamps 6. State the purpose of glue 7. State the types of adhesives 8. State the importance of pre-assembling 9. Interpret designed drawing	**Assemble table components**	

10. *Ensure proper handling of clamps* 11. *Ensure to use appropriate PPE*		
1. Define drawer 2. State the purpose of drawer 3. State the types of joints 4. *Ensure safe handling of hand tools machines* 5. *Ensure to use appropriate PPE*	**Make drawer**	
1. Interpret design drawing *2. Ensure proper handling of clamps* *3. Ensure the safety while using clamps* *4. Ensure to use appropriate PPE*	**Assemble drawer components**	
1. State the function of sanding machine 2. State types of sanding machine 3. State the purpose of wood filler 4. State the purpose of polish 5. State the types of polish ***6. Use sanding machine*** **7.** *Ensure proper handling of machine* **8.** *Ensure to use appropriate PPE*	**Perform finishing work**	
Chapter 2: Making chair		
1. Define chair 2. State the types of chairs 3. Label the components of chair *4. Ensure proper handling of machines* *5. Ensure to follow safety precautions while operating the machine* 6. *Ensure to use PPE*	**Prepare chair components**	
1. State the types of joint *2. Ensure proper handling of machines* *3. Ensure to use appropriate PPE*	**Make chair joint**	
1. Interpret design drawing *2. Ensure proper handling of clamps*	**Assemble chair component parts**	

3. *Ensure the safety while using clamps* 4. *Ensure to use PPE*		
Chapter 3: Making simple chokdrom		
1. Define chokdrom 2. Label the components of chokdrom 3. *Ensure proper handling of machines* 4. *Ensure to follow safety precautions while operating the machine* 5. *Ensure to use appropriate PPE*	**Prepare chokdrom components**	
1. State the types of joints 2. Define spindle moulder machine 3. State the function of spindle moulder machine 4. Label the parts of machine ***5. Use spindle moulder machine*** 6. *Ensure safe handling of hand tools and machines* 7. *Ensure to use appropriate PPE*	**Make chokdrom joints**	
MODULE 3: MAKING BED AND SOFA FRAMES **Chapter 1:** Making bed		XII
1. Define bed 2. State the types of beds 3. Label the components of bed 4. State the size of bed 5. Interpret drawing 6. Prepare cutting list 7. *Ensure proper handling of machines* 8. *Ensure to use appropriate PPE*	**Prepare bed components**	
1. State the types of joints 2. *Ensure safe handling of hand tools and machines* 3. *Ensure to use appropriate PPE*	**Make bed joints**	
1. Define ironmongery	**Assemble components of bed**	

2. State the types of fasteners 3. State the types of hardware fittings of bed 4. State the importance of diagonal checking 5. Use clamps 6. Perform finishing (Sanding and polishing) *7. Ensure proper handling of clamp* *8. Ensure to use appropriate PPE*		
Chapter 2: Making sofa frame		
1. Define sofa 2. State the types of sofas 3. Label the components of sofa 4. Interpret drawings 5. Prepare cutting list 6. State the function of wood turning lathe machine 7. Label the parts of wood turning lathe machine ***8. Use wood turning lathe machine*** *9. Ensure proper handling of machine* *10. Ensure to use appropriate PPE*	**Prepare sofa components**	
1. State the types of joints 2. State the function of band saw machine 3. Label the parts of band saw machine 4. State the function of jigs and fixture ***5. Use band sawing machine*** *6. Ensure proper handling of tools* *7. Ensure appropriate use of PPE*	**Prepare sofa joints**	
1. Interpret design drawing 2. State the importance of alignment 3. State the purpose of furniture stability *4. Ensure proper handling of machines*	**Assemble sofa components**	

5. *Ensure to use appropriate PPE*		
MODULE 4: MAKING STORAGE CABINET **Chapter 1:** Preparing cabinet		
1. Define cabinet 2. State the types of cabinet 3. Label the components of cabinet 4. Interpret drawing 5. *Ensure safe use of machines* 6. *Ensure to use appropriate PPE*	**Prepare cabinet components**	
1. State the types of joints 2. *Ensure safe use of machines* 3. *Ensure to use appropriate PPE*	**Make cabinet joints**	
1. Interpret design drawing 2. Check diagonal and alignment *3. Ensure safe use of machines* *4. Ensure to use appropriate PPE*	**Assemble cabinet components**	
Chapter 2: Making shutter joints and assemble parts		
1. Interpret drawing 2. State the function of shutter 3. State the types of shutters 4. Label the components of shutter 5. *Ensure safe handling of machines* 6. *Ensure to use appropriate PPE*	**Prepare shutter components**	
1. Sate the types of shutter joints 2. *Ensure safe handling of machines* 3. *Ensure to use appropriate PPE*	**Make shutter joints**	
1. Interpret design drawing 2. State the types of shutter hardware fittings 3. State the application of shutter hardware fittings ***4. Fix hardware fitting on shutter***	**Assemble shutter**	

5. *Ensure safe handling of machines* 6. *Ensure to use appropriate PPE*		

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills- ENGINEERING DRAWING

Learning objectives	Core concepts (Chapters/Topics)	Class
Chapter: 1 Interpreting Basic Engineering Drawing		IX
1. Define engineering drawing 2. State the purposes of engineering drawing 3. List the types and uses of drawing instruments 4. List the sizes of drawing papers 5. *Ensure clean and neatness of drawing* 6. *Ensure proper handling of drawing instruments*	**Use drawing instrument**	
1. Define the layout of a drawing sheet 2. Define the title block *3. Ensure clean and neatness of drawing* *4. Ensure Proper handling of drawing instruments*	**Lay out drawing sheet**	
1. Define signs and symbols 2. Define abbreviation *3. Ensure clean and neatness of drawing* 4. *Ensure Proper handling of drawing instruments*	**Draw engineering signs, symbols, and abbreviations**	
1. Define line 2. State the types of line and its application *3. Ensure clean and neatness of drawing* *4. Ensure Proper handling of drawing instruments*	**Drawing types of lines**	

1. Define lettering and numbering 2. Classify the styles of letters 3. List the types of letters 4. Define freehand lettering 5. List the sizes of letters 6. State the rules for lettering and numbering *7. Ensure clean and neatness of drawing* *8. Ensure Proper handling of drawing instruments*	**Draw a letter and number**	
1. Define dimension 2. State the types of dimensions 3. Explain the system of dimensions 4. State the terminologies of dimensions 5. State the rules for dimensioning *6. Ensure clean and neatness of drawing* *7. Ensure Proper handling of drawing instruments*	**Provide dimension**	
Chapter 2: Drawing isometric projections		X
1. Define drawing scale 2. List the types of scale *3. Ensure clean and neatness of drawing* *4. Ensure Proper handling of drawing instruments*	**Convert scale for drawing**	
1. Define isometric drawing 2. State the isometric terminologies *3. Carry out free hand sketching* *4. Ensure clean and neatness of drawing* *5. Ensure Proper handling of drawing instruments*	**Draw isometric blocks**	
1. Draw Orthographic projections *2.* Draw six principle views	**Draw an orthographic projections**	

3. Explain the method of obtaining six principle views 4. Explain four quadrants with the help of diagrams 5. Differentiate between first and third angle projections 6. Ensure clean and neatness of drawing 7. Ensure proper handling of drawing instruments		
Chapter 3: Interpreting technical drawing		XI
1. Define elevations (front, right, left, rear) 2. Define sections *3. Draw elevations* *4. Draw sections* *5. Ensure clean and neatness of drawing* *6. Ensure Proper handling of drawing instruments*	**Draw stool**	
1. Draw chair elevations 2. Draw chair sections *3. Ensure clean and neatness of drawing* *4. Ensure proper handling of drawing instruments*	**Draw chair**	
1. Draw elevations 2. Draw sections *3. Ensure clean and neatness of drawing* *4. Ensure proper handling of drawing instruments*	**Draw table**	

ANNEXURE II: ELECTRICAL

Instructional hours

Class	Modules covered	Chapters	Lessons	Theory (Hrs)	Practical (Hrs)	Total duration (Hrs)
IX	**Module 1:** Applying Fundamentals of Electricity	**Chapter 1:** Practising Occupational Health and Safety (OHS)	1. Apply Principles of 5S and OHS practice.	1	2	**18**
			2. Use Personal Protective Equipment (PPE).	1	2	
			3. Maintain workplace & personal safety.	1	2	
			4. Maintaining tools & equipment safety.	1	2	
			5. Follow the Electrical safety rules	1	2	
			6. Use Fire Extinguisher	1	2	
			7. Test conductor, semiconductor and insulator	2	3	**31**
			8. Perform instrument reading	1	5	
			9. Measure resistance	1	3	
			10. Measure voltage	1	2	
			11. Measure Current	1	2	
			12. Measure Power	1	2	
			13. Measure Frequency	1	2	
			14. Measure Energy	1	3	
		Chapter 3:	1. Verify Ohm's law	2	3	
			2. Verify characteristics of series circuit.	1	7	

		Verifying Dc circuits	3. Verify characteristics of parallel circuit.	1	7	**45**
			4. Verify characteristics of series parallel combined circuit.	1	7	
			5. Verify Kirchhoff's current law	1	7	
			6. Verify Kirchhoff's voltage law.	1	7	
		Chapter 4: Verifying AC circuits	1. Verify characteristics of AC and DC.	2	4	**38**
			2. Check phase sequence of three phase supply	1	2	
			3. Verify characteristics of balanced and unbalanced load in star connection	1	15	
			4. Verify characteristics of balanced delta load connection	1	12	
Total hours				**27**	**92**	**132**
Class	**Module covered**	**Chapters**	**Lessons**	**Theory (Hrs)**	**Practical (Hrs)**	**Total duration (Hrs)**
X	**Module 2:** Carrying out installation of panel board	**Chapter 1:** Installing protective device for single phase	1. Install distribution board for single phase	1	2	**17**
			2. Install MCB for single phase	1.5	2	
			3. Install RCCB for single phase	1.5	2	
			4. Install ELCB for single phase	1.5	2	
			5. Install changeover switch for single phase	1.5	2	

		Chapter 2: Installing protective device for three phase	1. Install MCB for three phase	1.5	3	**31**
			2. Install bus bar	1	3	
			3. Install Distribution board for three phase	1.5	3	
			4. Install RCCB for three phase	1.5	3	
			5. Install ELCB for three phase	1.5	3	
			6. Install MCCB	1.5	3	
			7. Install change over switch for three phase	1.5	3	
		Chapter 3: Installing Earthing	1. Install plate Earthing	2	11.5	**50**
			2. Install pipe Earthing	1	11	
			3. Install slab Earthing	1	11	
			4. Install Building lightning arrester	1	10.5	
		Applying Engineering Drawing	1. Lay out drawing sheet	0.25	1	**34**
			2. Draw title block	0.25	1	
			3. Draw single stroke letter	0.25	1	
			4. Draw lines	0.25	1	
			5. Dimension the objects	0.25	0.5	
			6. Draw triangle	0.25	1	
			7. Draw cube	0.25	1	
			8. Draw octagon	0.25	1	

			9. Draw Ellipse	0.25	1	
			10. Draw front view of an object	0.25	2	
			11. Draw top view of an object	0.25	2	
			12. Draw right side view of an object	0.25	2	
			13. Draw left side view of an object	0.25	2	
			14. Draw rear view of an object	0.25	2	
			15. Draw isometric views	0.25	1.5	
			16. Draw full section of an object	0.25	3.5	
			17. Draw half section of an object	0.25	3	
			18. Draw partial section of an object	0.25	3	
Total hours				**27.5**	**104.5**	**132**
Class XI	**Modules covered**	**Chapters**	**Lessons**	**Theory (Hrs)**	**Practical (Hrs)**	**Nominal duration (Hrs)**
		Applying Engineering Drawing for electrical	1. Draw electrical signs and symbols	0.25	1.5	
			2. Draw layout plan of lighting points	0.25	1.5	
			3. Draw layout plan of power points	0.25	1.5	
			4. Draw conduit layout plan of lighting points	0.25	3	
			5. Draw conduit layout plan of power points	0.25	3	

			6. Draw plate earthing layout plan	0.5	3.25	**34**
			7. Draw final circuit (SB-points) wiring diagram	0.5	3.25	
			8. Draw sub-main distribution board (SMDB) wiring diagram	0.5	3.25	
			9. Draw Main Distribution Board (MDB) Wiring Diagram	0.5	3.25	
			10. Draw Staircase Wiring	0.5	3	
	Module 3: Carrying out installation of security and communication system		11. Draw Go-down Wiring diagram	0.75	3	**26**
		Chapter 1: Installing security system	1. Preparing Bio Net Connector (BNC)	1	2	
			2. Install CCTV	2	5	
			3. Install Burglar alarm	1	5	
			4. Install Hooter/Siren	1	3	
			5. Install Fire Alarm System	1	5	
		Chapter 2: Installing Communication system	1. Prepare LAN cable	1	5	**24**
			2. Install I/O box	1	5	
			3. Prepare Balun plug	1	3	
			4. Connect RF connector	1	3	
			5. Install TV socket	1	3	
		Chapter 3: Testing Security and communication system	1. Test BNC	1	2	**18**
			2. Test Modular Jack	1	2	
			3. Test LAN cable	1	2	
			4. Test Fire Alarm	1	2	
			5. Test Burglar Alarm	1	2	
			6. Test CCTV	1	2	

		Chapter 4: Repair home appliances	1. Repair water boiler	1	8	**54**
			2. Repair curry cooker	1	8	
			3. Repair rice cooker	1	8	
			4. Repair electric iron	1	8	
			5. Repair electric heater	1	8	
			6. Repair geyser	1	8	
	Module 4: Carrying out domestic wiring	**Chapter 1:** Preparing wire Joints	1. Prepare rat-tail joint	0.5	2	**7.5**
			2. Prepare T-joint	0.5	2	
			3. Prepare Straight joint	0.5	2	
		Chapter 2: Performing Lighting and Power circuit wiring	1. Perform PVC (Poly Vinyl Chloride) Casing Capping wiring for two lighting	2	6.5	**28.5**
			2. Perform PVC conduit wiring for two lighting and one power load	3	7	
			3. Perform MS conduit wiring for three lighting and one power load	3	7	
Total hours				**37**	**155**	**192**
Class	**Modules covered**	**Chapters**	**Lessons**	**Theory (Hrs)**	**Practical (Hrs)**	**Nominal duration (Hrs)**
XII		**Chapter 2:** Performing Lighting and Power circuit wiring	1. Laying concealed conduit	2.5	8	**62**
			2. Perform stair case wiring	2.5	10	
			3. Perform Hostel wiring	3	10	
			4. Perform call bell wiring	3	10	
			5. Perform go down wiring	3	10	

		Chapter 3: Performing Installation test	1. Perform IR test	1	3	**27.5**
			2. Perform continuity test	1	3	
			3. Perform Polarity test	1	3	
			4. Perform earth continuity test	1	3	
			5. Perform Earth resistance test	1	3	
			6. Perform soil resistivity test	1.5	6	
		Chapter 4: Troubleshooting building wiring	1. Troubleshoot fluorescent lamp/LED and fittings	2	5	**20.5**
			2. Troubleshoot Fan and fitting	2	5	
			3. Troubleshoot HID lamp and fitting	1.5	5	
		Chapter 5: Estimating materials	1. Estimate materials for PVC Casing Capping wiring	3	18	**82**
			2. Estimate materials for PVC conduit wiring	3	18	
			3. Estimate materials for MS conduit wiring	2	18	
			4. Estimate materials for concealed HDPE pipe wiring	2	18	
			Total hours	**36**	**156**	**192**
						648

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Apply principle of 5S to organize and manage the workplace
2. Use PPE to protect from workplace hazards
3. Maintain work place and personal safety to reduce the risk in the workplace
4. Maintain hand tools and equipment safety to increase the efficiency of tools and equipment
5. Use fire extinguisher to combat the fire
6. Introductory Knowledge
7. Test to check continuity of conductor, insulator, and semiconductor
8. Perform instrument reading
9. Measure resistance
10. Measure voltage
11. Measure current
12. Measure power
13. Measure energy
14. Verify Ohm's law
15. Verify characteristics of series circuit
16. Verify characteristics of parallel circuit
17. Verify characteristics of series parallel combined circuit
18. Verify Kirchhoff's current law
19. Verify Kirchhoff's voltage law
20. Verify characteristics of AC and DC
21. Check phase sequence of three phase supply
22. Verify characteristics of balanced and unbalanced load in star connection
23. Verify characteristics of balanced delta load connection

2) CLASS X COMPETENCIES

1. Install distribution board for single phase
2. Install miniature circuit breaker for single phase
3. Install Residual current circuit breaker for single phase
4. Install Earth leakage circuit breaker for single phase
5. Install changeover switch for single phase

6. Install MCB for three phase
7. Install Bus bar
8. Install Distribution board for three phase
9. Install RCCB for three phase
10. Install ELCB for three phase
11. Install MCCB
12. Install changeover switch for three phase
13. Install Plate earthing
14. Install Pipe Earthing
15. Install slab earthing
16. Install building lightning arrester
17. Use drawing instruments
18. Lay out of drawing sheet

3) CLASS XI COMPETENCIES

1. Interpret engineering signs, symbols and abbreviation
2. Draw different types of lines
3. Letter and numbering
4. Dimension
5. Convert Scale for drawing
6. Draw Isometric blocks
7. Draw orthographic projection
8. Draw simple building plan
9. Prepare Bio-net connector
10. Install CCTV
11. Install Burglar alarm
12. Install Hooter/ siren
13. Install fire alarm
14. Prepare local area network cable
15. Install I/O box
16. Prepare balun plug
17. Connect Radio Frequency connector
18. Install TV socket

19. Test BNC connector
20. Test modular jack
21. Test LAN cable
22. Test fire alarm
23. Test Burglar alarm
24. Test CCTV

4) CLASS XII COMPETENCIES

1. Preparing rat tail joint
2. Preparing T-Joint
3. Preparing Straight Joint
4. Performing Lighting and power circuit wiring
5. Performing PVC casing capping wiring for 2 lighting loads
6. Performing PVC conduit wiring for 2 lighting and 1 power load
7. Performing MS conduit wiring for 3 lighting and 1 power load
8. Laying concealed conduit
9. Performing stair case wiring
10. Performing hostel wiring
11. Performing call bell wiring
12. Performing go-down wiring
13. Performing corridor wiring
14. Performing IL test
15. Performing continuity test
16. Performing polarity test
17. Performing earth continuity test
18. Performing earth resistance test
19. Performing soil resistivity test
20. Troubleshooting fluorescent lamp/LED and fitting
21. Troubleshooting fan and fitting
22. Troubleshooting High Intensity Discharge (HID) lamp and fitting
23. Estimating materials for PVC casing capping wiring
24. Estimating materials for Poly Vinyl Chloride (PVC) conduit wiring
25. Estimating materials for Mild steel (MS) conduit wiring

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	Core concepts (Chapters/Topics)	Class
	MODULE 1: APPLYING FUNDAMENTAL OF ELECTRICITY **Chapter 1: Practising Occupational Health and Safety (OHS)**	**IX**
1.2.1 Define 5S 1.2.2 State the purposes of 5S 1.2.3 Explain the principles of 5s 1.2.4 Define OHS 1.2.5 State the importance of OHS 1.2.6 Explain the rights of employee 1.2.7 State the main causes of accidents 1.2.8 State the safety rules 1.2.9 *Be responsible and vigilant while following OHS* 1.2.10 *Ensure safe handling of materials and equipment*	**1. Apply principles of 5S**	
1. Define PPE 2. State the importance of PPE 3. List the categories of PPE 4. *Ensure safe handling of PPE*	**2. Use Personal Protective Equipment (PPE)**	
1. Define safety precaution 2. List the different types of safety 3. Explain workshop and personal safety 4. State the importance of maintaining workplace and personal safety 5. Explain the importance of safety signs and symbols 6. Explain the emergency exit 7. Describe the layout of the workshop	**3. Maintain workplace & personal safety**	

8. Ensure safe handling of equipment 9. Ensure correct operation of fire extinguisher 10. Ensure safe working environment		
1. Explain tools and equipment safety 2. State the importance of maintaining tools and equipment 3. List Dos and don'ts of maintaining tools and equipment 4. *Be responsible and vigilant while maintaining tools and equipment* 5. Ensure *safe handling of tools and equipment*	**4. Maintain tools & equipment safety**	
1. Define fire extinguisher 2. Label the parts of fire extinguisher 3. Explain the types of fire 4. List types of fire extinguishers 5. State the methods of combating/extinguishing fires 6. Explain the types of fire extinguishers 7. State the methods of combat/extinguisher fires 8. *Be responsible and vigilant while using fire extinguisher* 9. *Ensure safe handling fire extinguisher*	**5. Using fire extinguisher**	
Chapter 2: Applying basic electrical theory		
2.1.1 Introduction to Electricity. 2.1.2 Explain generation of electricity 2.1.3 Describe trends and scope of Domestic wiring technician 1. Define conductor, insulator and semiconductor 2. Explain the properties of conductor, insulator and semiconductor 3. Differentiate among conductors, insulators and semiconductors	1. **Test conductor, semiconductor and insulator**	

4. Use multimeter 5. Use IR Tester 6. Be responsible and vigilant while following testing 7. Ensure safe handling of instruments.		
1. Define instrument 2. List types of scale 3. List the types of electrical measuring instruments 4. State the functions of measuring instruments 5. List signs & symbols of instruments 6. Explain the errors in the instruments. 7. Be responsible and vigilant while performing instrument reading *8.* Ensure safe handling of instrument	**2. Perform instrument reading**	
1. Define resistance, resistor and resistivity (unit and symbol) 2. State the factors affecting resistance 3. List the types of resistors 4. List the application of resistors 5. Determine the value of resistors using colour coding chart ***6. Use multimeter*** *7. Ensure safe handling of measuring instruments* 8. *Ensure to select correct range of the meters*	**3. Measure resistance**	
2.4.1 Define voltage (unit and symbol) 2.4.2 State the difference between AC and DC source 2.5.3 List the types of voltmeters *2.5.4* ***Use voltmeter*** 2.5.5 ***Use multimeter***	**4. Measure voltage**	

2.5.6 Ensure safe handling of measuring instruments. 2.5.7 *Ensure to select the correct range of the meters.*		
2.6.1 Define Current (unit and symbol) 2.6.2 State types of current 2.6.3 Explain the effects of current 2.6.4 List the types of ammeters 2.6.5 ***Use Ammeter*** *2.6.6* ***Use clamp on multimeter*** *2.6.7 Ensure safe handling of measuring instruments* *2.6.8 Ensure to select correct range of the meters*	**5. Measure current**	
2.7.1 Define Power (unit and symbol) 2.7.2 State the relation between current, voltage and power 2.7.3 List the types of power 2.7.4 Explain power triangle 2.7.5 Define power factor *2.7.6* ***Use Wattmeter*** *2.7.7 Ensure safe handling of measuring instruments* *2.7.8 Ensure to select correct range of the meters*	**6. Measure power**	
2.7.1 Define frequency (unit and symbol) 2.7.2 State the relation between time and frequency 2.7.3 ***Use Frequency Meter*** 2.7.4 *Ensure safe handling of measuring instruments* 2.7.5 *Ensure to select correct range of the meters*	**7. Measure frequency**	

2.8.1 Define Electrical Energy (unit and symbol) 2.8.2 Calculate energy consumed 2.8.3 Calculate electricity tariff 2.8.4 List the types of electrical load *2.8.5* ***Use Energy Meter*** *2.8.6 Ensure safe handling of measuring instruments* *2.8.7 Ensure to select correct range of the meters*	**8. Measure energy**	
Chapter 3: Verifying DC circuits		
1. State Ohm's law 2. State the application of Ohm's law 3. State the limitations of Ohm's law 4. Use ammeter 5. Use voltmeter 6. Ensure safe handling of meters 7. Ensure to check the connection of meters 8. Ensure to verify the circuit connection	**1. Verify Ohm's law**	
1. Define series circuit 2. Explain the characteristics of series circuit 3. State the advantages and disadvantages of series circuit 4. List the application of series circuit *5.* ***Use ammeter*** *6.* ***Use voltmeter*** 7. *Ensure safe handling of meters* 8. *Ensure to check the connection of meters* 9. *Ensure to verify the circuit connection*	2. **Verify characteristics of series circuit**	
1. Define parallel circuit 2. Explain the characteristics of parallel circuit		

3. State the advantages and disadvantages of parallel circuit 4. List the applications of parallel circuit *5.* ***Use ammeter*** *6.* ***Use voltmeter*** *7.* ***Interpret circuit diagram*** 8. *Ensure safe handling of instruments* 9. *Ensure to check the connection of meters* 10. *Ensure to verify the circuit connection*	**3. Verify characteristics of parallel circuit**	
1. State the advantages and disadvantages of series parallel combined circuit 2. State the application of series parallel combined circuit 3. Differentiate between series and parallel circuit *4.* ***Use ammeter*** *5.* ***Use voltmeter*** 6. *Ensure safe handling of instruments* 7. *Ensure to check the connection of meters* 8. *Ensure to verify the circuit connection*	**4. Verify characteristics of series parallel combined circuit**	
1. State Kirchhoff's current law 2. Explain sign-convention in applying Kirchhoff's current law 3. State the limitations of Kirchhoff's current law 4. State applications of Kirchhoff's current law *5.* ***Use ammeter and voltmeter*** 6. *Ensure safe handling of instruments* 7. *Ensure to check the connection of meters* 8. *Ensure to verify the circuit connection*	**5. Verify Kirchhoff's current law**	
1. State Kirchhoff's voltage law 2. Explain sign-convention in applying Kirchhoff's voltage law 3. State the limitations of Kirchhoff's voltage law	**6. Verify Kirchhoff's voltage law**	

4. State applications of Kirchhoff's voltage law 5. ***Use ammeter*** 6. ***Use voltmeter*** 7. *Ensure safe handling of instruments* 8. *Ensure to check the connection of meters* 9. *Ensure to verify the circuit connection*		
Chapter 4: Verifying AC circuits		
1. Explain characteristics of AC and DC 2. List the advantages of AC over DC 3. List the advantages of DC over AC 4. State the application of Cathode Ray Oscilloscope (CRO) 5. Explain the types of sources ***6. Use CRO*** ***7. Operate function generator*** ***8. Use Multimeter*** *9. Ensure safe handling of tools and equipment* *10. Be responsible and vigilant while operating the CRO*	**1. Verify characteristics of AC and DC**	
1. State difference between single and polyphase 2. List advantages of polyphase over single phase 3. List the types of polyphase circuit 4. State the purpose of checking phase sequence 5. ***Use phase sequence meter*** 6. *Ensure safe handling of instruments* 7. *Ensure to check the connection of meters* 8. *Ensure to verify the circuit connection*	**4.2 Check phase sequence of three phase supply**	
1. State the purpose of interconnection of three phase 2. Differentiate between star and delta connection 3. Explain the characteristics of balanced star load	**4.3 Verify characteristics of balanced and unbalanced load in star connection**	

4. Explain the characteristics of unbalanced star load in 3-wire and 4-wire supply system 5. ***Use multimeter*** 6. ***Use clamp on meter*** 7. *Ensure safe handling of instruments* 8. *Ensure to check the connection of meters* 9. *Ensure to verify the circuit connection*		
1. State the advantages and disadvantages of delta connection 2. Explain the characteristics of balanced delta load 3. State the application of delta connected load 4. ***Use multimeter*** 5. ***Use clamp on meter*** 6. *Ensure safe handling of instruments* 7. *Ensure to check the connection of meters* 8. *Ensure to verify the circuit connection*	**4.4 Verify characteristics of balanced delta load connection**	
MODULE 2: CARRYING OUT INSTALLATION OF PANEL BOARD **Chapter 1:** Install protective devices for single phase		**X**
1.1.1 List the types of distribution board 1.1.2 State the function of distribution board 1.1.3 **Use drilling machine**	**1.1 Install distribution board for single phase**	
1. Define MCB 2. List the types of MCB 3. Explain the working principle of MCB 4. State the application of MCB 5. Select MCB as per requirement 6. Select wire size for the connection of single phase MCB 7. Select colour coding for the connection of single phase MCB 8. ***Use Multimeter***	**1.2 Install miniature circuit breaker for single phase**	

9. *Ensure safe handling of instruments* 10. *Ensure to verify the circuit connection*		
1.3.1 Define RCCB 1.3.2 Explain working principle of RCCB 1.3.3 State the application of RCCB 1.3.4 Select RCCB as per requirement 1.3.5 ***Use multimeter*** 1.3.6 *Ensure safe handling of instruments* 1.3.7 *Ensure to verify the circuit connection*	**1.3 Install residual current circuit breaker for single phase**	
1.4.1 Define ELCB 1.4.2 Explain the working principle of ELCB 1.4.3 State the function of ELCB 1.4.4 State the importance of setting tripping current 1.4.5 ***Set tripping current*** 1.4.6 ***Use multimeter*** *1.4.7 Ensure safe handling of instrument* *1.4.8 Ensure to verify the circuit connection*	**1.4 Install earth leakage circuit breaker for single phase**	
1.5.1 Define changeover switch 1.5.2 List the types of changeover switch 1.5.3 State the application of changeover switch 1.5.4 Select changeover switch as per the current rating 1.5.5 ***Use drilling machine*** *1.* ***Use multimeter*** 1.5.7 *Ensure safe handling of instruments* 1.5.8 *Ensure to verify the circuit connection*	**1.5 Install changeover switch for single phase**	
Chapter 2: Install protective devices for three phase		
1. Explain the working principle of three phase MCB	**2.1 Install MCB for three phase**	

2. State the application of three phase MCB 3. Select three phase MCB as per requirement 4. Select wire size for the connection of three phase MCB 5. Select colour coding for the connection of three phase MCB 6. Connect three Phase MCB *7.* ***Use Multimeter*** 8. *Ensure safe handling of instruments* 9. *Ensure to verify the circuit connection*		
1. Define bus bar 2.2.2 Select bus bar	**2.2 Install bus bar**	
2.3.1 List the types of distribution board for three phase	**2.3 Install Distribution board for three phase**	
1. Select RCCB for Three phase load 2. State the advantages and limitations of RCCB ***3. Use multimeter*** 4. *Ensure safe handling of instruments* 5. *Ensure to verify the circuit connection*	**2.4 Install RCCB for three phase**	
1. State the importance of setting tripping current 2. Select ELCB for three phase ***3. Set tripping current*** ***4. Use multimeter*** 5. *Ensure safe handling of instruments* 6. *Ensure to verify the circuit connection*	**2.5 Install ELCB for three phase**	
1. Define MCCB 2.6.2 State the function for MCCB 2.6.3 Select MCCB as per requirement 2.6.4 ***Use multimeter*** *2.6.5 Ensure safe handling of instruments* *2.6.6 Ensure to verify the circuit connection*	**2.6 Install MCCB**	

1. Select current rating of changeover switch for three phase 2.7.2 ***Use multimeter*** 2.7.3 ***Use drilling machine*** *2.7.4 Ensure safe handling of instruments* *2.7.5 Ensure to verify the circuit connection*	**2.7 Install changeover switch for three phase**	
Chapter 3: Install earthing		
1. Introduce earthing 3.1.2 List the types of earthing 3.1.3 State the factors affecting soil resistivity 3.1.4 State the purpose of watering arrangement 3.1.5 State the purpose of using charcoal and salt 3.1.6 Explain the artificial treatment of soil 3.1.7 Select the size of earth lead 3.1.8 State the purpose of bonding earth electrode 3.1.9 ***Interpret drawing*** 3.1.10 ***Perform basic masonry work*** *3.1.11 Ensure efficient use of materials* *3.1.12 Ensure proper disposal of waste*	**3.1 Install plate earthing**	
1. List the advantages of pipe earthing 3.2.2 List the application of pipe earthing 3.2.3 ***Interpret drawing*** 3.2.4 ***Perform masonry work*** 3.2.5 *Ensure efficient use of materials* 3.2.6 *Ensure proper disposal of waste*	**3.2 Install pipe earthing**	
1. Define slab earthing 3.3.2 State the application of slab earthing 3.3.3 List the advantages of slab earthing	**3.3 Install slab earthing**	

3.3.4 State the importance of neutral earthing system 3.3.5 ***Use welding machine*** 3.3.6 ***Use spanner*** *3.3.7 Ensure efficient use of materials* *3.3.8 Ensure proper disposal of waste*		
3.4.1 Define LA 3.4.2 List the types of building LA 3.4.3 State the application of building LA 3.4.4 ***Interpret drawing*** 3.4.5 ***Use drilling machine*** 3.4.6 ***Use IR tester*** 3.4.7 ***Use earth tester*** 3.4.8 *Ensure safe handling of testing kits.* 3.4 9 *Ensure efficient use of materials* 3.4.10 *Ensure proper disposal of waste*	**3.4 Install building lightning arrester**	
Chapter 4: Applying engineering drawing		
4.1.1 Stare importance of drawing margin 4.1.2 List types and sizes of drawing sheet 4.1.3 state standard gap between margin and edge of the drawing sheet ***4.1.4 Use set square*** ***4.1.5 Use T scale*** 4.1.6 *Ensure clean and neatness of drawing.* 4.1.7 *Ensure proper handling of drawing instruments.*	**4.1 Lay out drawing sheet**	
4.2.1 Define title block 4.2.2 State the importance of title block 4.2.3 Explain formats of title block ***4.2.4 Use set square*** ***4.2.5 Use T scale***	**4.2 Draw title block**	

4.2.6 Ensure clean and neatness of drawing. *4.2.7 Ensure proper handling of drawing instruments*		
4.3.1 Define lettering 4.3.2 Define single stroke lettering 4.3.3 State the characteristics of type A and type B 4.3.4 State the purpose of drawing grid lines 4.3.5 List the types of pencil ***4.3.6 Use pencil*** ***4.3.7 Use set square*** ***4.3.8 Use T scale*** *4.3.9 Ensure clean and neatness of drawing.* *4.3.10 Ensure proper handling of drawing instruments*	**4.3 Draw single stroke letter**	
4.4.1 List the types of lines in engineering drawing 4.4.2 List the Application of lines ***4.4.3 Use set square*** ***4.4.4 Use T scale*** *4.4.5 Ensure clean and neatness of drawing.* *4.4.6 Ensure proper handling of drawing instruments*	**4.4 Draw lines**	
4.5.1 List the rules of dimensioning 4.5.2 State the elements of dimensioning 4.5.3 State the methods of indicating dimensions 4.5.4 State the arrangement of dimensions 4.5.5 State dimensioning of geometrical shapes ***4.5.6 Use set square*** ***4.5.7 Use T scale*** ***4.5.8 Use Protractor*** *4.5.9 Ensure clean and neatness of drawing.*	**4.5 Dimension the objects**	

4.5.10 Ensure proper handling of drawing instruments		
4.6.1 Define triangle 4.6.2 List the types of triangle ***4.6.3 Use set square*** ***4.6.4 Use T scale*** ***4.6.5 Use compass*** *4.6.6 Ensure clean and neatness of drawing.* *4.6.7 Ensure proper handling of drawing instruments*	**4.6 Draw triangle**	
4.7.1 Define cube ***4.7.2 Use set square*** ***4.7.3 Use T scale*** ***4.7.4 Use protractor*** *4.7.5 Ensure clean and neatness of drawing.* *4.7.6 Ensure proper handling of drawing instruments*	**4.7 Draw cube**	
4.8.1 Define octagon 4.8.2 State the methods of constructing octagon ***4.8.3 Use set square*** ***4.8.4 Use T scale*** ***4.8.5 Use compass*** *4.8.6 Ensure clean and neatness of drawing.* *4.8.7 Ensure proper handling of drawing instruments*	**4.8 Draw octagon**	
4.9.1 Define ellipse 4.9.2 State the types of ellipse	**4.9 Draw ellipse**	

4.9.3 Define eccentricity 4.9.4 Define focus 4.9.5 Define vertex 4.9.6 Define quadrant 4.9.7 State the methods of construction of ellipse ***4.9.8 Use set square*** ***4.9.9 Use T scale*** ***4.9.10 Use compass*** *4.9.11 Ensure clean and neatness of drawing.* *4.9.11 Ensure proper handling of drawing instruments*		
4.10.1 State the types of projection 4.10.2 State the application of projection 4.10.3 State the features of projection 4.10.4 Draw the symbol of orthographic projection ***4.10.5 Use set square*** ***4.10.6 Use T scale*** ***4.10.7 Use compass*** *4.10.8 Ensure clean and neatness of drawing.* *4.10.9 Ensure proper handling of drawing instruments*	**4.10 Draw front view of an object**	
4.11.1 State the types of projection 4.11.2 State the application of projection 4.11.3 State the features of projection 4.11.4 Draw the symbol of orthographic projection ***4.11.5 Use set square*** ***4.11.6 Use T scale*** ***4.1.7 Use compass*** ***4.11.8 Use mini drafter*** ***4.11.9 Use French curves*** ***4.11.10 Use divider*** *4.11.11 Ensure clean and neatness of drawing.* *4.11.12 Ensure proper handling of drawing instruments*	**4.11 Draw top view of an object**	

4.12.1 State the types of projection 4.12.2 State the application of projection 4.12.3 State the features of projection 4.12.4 Draw the symbol of orthographic projection ***4.12.5 Use set square*** ***4.12.6 Use T scale*** ***4.12.7 Use compass*** *4.12.8 Ensure clean and neatness of drawing.* *4.12.9 Ensure proper handling of drawing instruments*	**4.12 Draw right side view of an object**	
4.13.1 State the types of projection 4.13.2 State the application of projection 4.13.3 State the features of projection 4.13.4 Draw the symbol of orthographic projection ***4.13.5 Use set square*** ***4.13.6 Use T scale*** ***4.13.7 Use compass*** *4.13.8 Ensure clean and neatness of drawing.* *4.13.9 Ensure proper handling of drawing instruments*	**4.13 Draw left side view of an object**	
4.14.1 State the types of projection 4.14.2 State the application of projection 4.14.3 State the features of projection 4.14.4 Draw the symbol of orthographic projection ***4.14.5 Use set square*** ***4.14.6 Use T scale*** ***4.14.7 Use compass*** *4.14.8 Ensure clean and neatness of drawing.* *4.14.9 Ensure proper handling of drawing instruments*	**4.14 Draw rear view of an object**	
4.15.1 State axonometric projection 4.15.2 Explain principal of isometric projection 4.15.3 List the types of lines in an isometric projection	**4.15 Draw isometric view**	

4.15.4 Explain dimensioning of isometric projection ***4.15.5 Use set square*** ***4.15.6 Use T scale*** ***4.15.7 Use compass*** ***4.15.8 Use mini drafter*** *4.15.8 Ensure clean and neatness of drawing.* *4.15.9 Ensure proper handling of drawing instruments*		
4.16.1 Define full sectioning 4.16.2 State the purpose of sectioning 4.16.3 List the types of cutting plane 4.16.4 List the rules of sectioning ***4.16.5 Use set square*** ***4.16.6 Use T scale*** ***4.16.7 Use mini drafter*** *4.16.8 Ensure clean and neatness of drawing.* *4.16.9 Ensure proper handling of drawing instruments*	**4.16 Draw full section of an object**	
4.17.1 Define half sectioning 4.17.2 State the difference between full section and half section ***4.17.3 Use set square*** ***4.17.4 Use T scale*** ***4.17.5 Use mini drafter*** *4.17.6 Ensure clean and neatness of drawing.* *4.17.7 Ensure proper handling of drawing instruments*	**4.17 Draw half section of an object**	
4.18.1 Define partial sectioning 4.18.2 State the difference between half section and partial section ***4.18.3 Use set square*** ***4.18.4 Use T scale*** ***4.18.5 Use mini drafter*** *4.18.6 Ensure clean and neatness of drawing.*	**4.18 Draw partial section of an object**	

4.18.7 Ensure proper handling of drawing instruments		

Chapter 1: Applying engineering drawing for electrical		**XI**
1.1.1 List the types of electrical signs and symbols 1.1. 2 State the application of electrical signs and symbols ***1.1.3 Use set square*** ***1.1.4 Use T scale*** ***1.1.5 Use compass*** ***1.1.6 Use mini drafter*** *1.1.7 Ensure clean and neatness of drawing.* 1.1.8 *Ensure proper handling of drawing instruments*.	**1.1 Draw electrical signs and symbol**	
1.2.1 State the types of lighting load 1.2.2 State the purpose of lighting layout plan 1.2.3 State the colour coding and wire size for lighting point ***1.2.4 Use set square*** ***1.2.5 Use T scale*** ***1.2.6 Use compass*** ***1.2.7 Use mini drafter*** 1.2.8 *Ensure clean and neatness of drawing* 1.2.9 *Ensure proper handling of drawing instruments*.	**1.2 Draw layout plan of lighting load**	
1.3.1 State the purpose of layout plan of power point 1.3.2 State the colour coding and wire size for power point 1.3.3 Describe the requirement for lettering. ***1.3.4 Use set square*** ***1.3.5 Use T scale*** ***1.3.6 Use compass***	**1.3 Draw layout plan of power point**	

1.3.7 Use mini drafter 1.3.8 *Ensure clean and neatness of drawing*. 1.3.9 *Ensure proper handling of drawing instruments*.		
1.4.1 State the purpose of conduit layout plan ***1.4.2 Use set square*** ***1.4.3 Use T scale*** ***1.4.4 Use compass*** 1.4.5 *Ensure clean and neatness of drawing*. 1.4.6 *Ensure proper handling of drawing instruments*.	**1.4 Draw conduit layout plan of lighting points**	
1.5.1 State the purpose of conduit layout plan 1.5.2 Describe the requirement for lettering. ***1.5.3 Use set square*** ***1.5.4 Use T scale*** ***1.5.5 Use mini drafter*** 1.5.6 *Ensure clean and neatness of drawing*. 1.5.7 *Ensure proper handling of drawing instruments*.	**1.5 Draw conduit layout plan of power points**	
1.6.1 Define earthing 1.6.2 List types of earthing 1.6.3 List components of plate earthing 1.6.4 State purpose of earthing ***1.6.5 Use set square*** ***1.6.6 Use T scale*** ***1.6.7 Use compass*** ***1.6.8 Use mini drafter*** 1.6.9 *Ensure clean and neatness of drawing*. 1.6.10 Ensure *proper handling of drawing instruments*.	**1.6 Draw plate earthing layout plan**	

1. Define legend 2. State the purpose of legend 3. List types of wire 4. List size of wire 5. ***Use set square*** 6. ***Use T scale*** 7. ***Use mini drafter*** 1.7.8 *Ensure clean and neatness of drawing.* 1.7.9 *Ensure proper handling of drawing instruments*.	**1.7 Draw final circuit (SB points) wiring diagram**	
1.8.1 Define SMDB 1.8.2 State the function of SMDB projection. ***1.8.3 Use set square*** ***1.8.4 Use T scale*** ***1.8.5 Use mini drafter*** *1.8.6 Ensure clean and neatness of drawing.* *1.8.7 Ensure proper handling of drawing instruments*.	**1.8 Draw SMDB wiring diagram**	
1.9.1 Define wiring diagram 1.9.2 State the purpose of Main Distribution board (MDB) ***1.9.3 Use set square*** ***1.9.4 Use T scale*** ***1.9.5 Use mini drafter*** *1.9.6 Ensure clean and neatness of drawing.* *1.9.7 Ensure proper handling of drawing instruments*.	**1.9 Draw MDB wiring diagram**	
1.10.1 State the application of staircase wiring ***1.10.2 Use set square*** ***1.10.3 Use T scale*** ***1.10.4 Use mini drafter***	**1.10 Draw staircase wiring**	

1.10.5 Use divider *1.10.6 Ensure clean and neatness of drawing.* *1.10.7 Ensure proper handling of drawing instruments.*		
1.11.1 State the application of godown wiring ***1.11.2 Use set square*** ***1.11.3 Use T scale*** ***1.11.4 Use mini drafter*** ***1.11.5 Use divider*** *1.11.6 Ensure clean and neatness of drawing.* *1.11.7 Ensure proper handling of drawing instruments.*	**1.11 Draw godown wiring**	
MODULE 3: CARRYING OUT INSTALLATION OF SECURITY AND COMMUNICATION SYSTEM **Chapter 1:** Install security system		
1. List the types of BNC 2. List the application of BNC 3. Explain constructional parts of BNC 4. Explain the types of Coaxial cable based on size 5. Explain constructional parts of coaxial cable 6. State the importance of of using BNC 7. ***Use BNC crimping tool***	**1.1 Prepare bio-net connector**	
1. Explain security system 2. State the types of security system 3. State the importance of security system 4. List the types of CCTV system 5. List the application of CCTV 6. Explain the component in a CCTV system and its function 7. State the types and features of CCTV camera 8. State the types and features of CCTV recorders	**1.2 Install CCTV**	

9. Explain the consequences of inappropriate selection and location of camera 1.2.11 ***Interpret drawing*** 1.2.12 ***Use multimeter*** 1.2.13 ***Use drilling machine***		
1.3.1 Define burglar alarm 1.3.2 List the components of burglar alarm 1.3.3 List the types of burglar alarm system 1.3.4 Identify the types of alarms and sensors 1.3.5 Explain typical alarm circuit diagram 1.3.6 ***Interpret drawing*** 1.3.7 ***Use multimeter*** 1.3.8 ***Use drilling machine***	**1.3 Install burglar alarm**	
1.4.1 Define hooter and siren 1.4.2 State the types of hooters and siren 1.4.3 List the application of hooter and siren 1.4.4 ***Interpret drawing*** 1.4.5 ***Use multimeter*** 1.4.6 ***Use drilling machine***	**1.4 Install hooter/siren**	
1.5.1 Define fire alarm 1.5.2 Identity the types of fire alarm 1.5.3 Identify the types of sensors and detectors 1.5.4 Select location of fire alarm 1.5.5 ***Use drilling machine***	**1.5 Install fire alarm**	
Chapter 2: Install communication system		
2.1.1 Define communication system 2.1.2 List the types of communication system 2.1.3 List the types of communication cable 2.1.4 State the difference between RJ11 and RJ45 connector	**2.1 Prepare local area network cable**	

2.1.5 State the function of individual pins 2.1.6 List the types of LAN cable connection 2.1.7 List the types of LAN cable 2.1.8 State the application of LAN cable 2.1.9 ***Use LAN cable tester*** 2.1.10 ***Use LAN crimping tools***		
2.2.1 Read colour coding of modular jack 2.2.2 State the purpose of I/O box 2.2.3 ***Use impact tool***	**2.2 Install I/O box**	
2.3.1 List the types of coaxial cable 2.3.2 List the types of balun plug 2.3.3 State the application of balun plug 2.3.4 ***Use multimeter***	**2.3 Prepare balun plug**	
2.4.1 List the types of RF connector 2.4.2 State the purpose of RF connector 2.4.3 State the application of RF connector 2.4.4 ***Use crimping tools***	**2.4 Connect radio frequency connector**	
2.5.1 List the types and size if coaxial cable 2.5.2 State the standard installation rules 2.5.3 ***Use drilling machine***	**2.5 Install TV socket**	
Chapter 3: Test security and communication system		
3.1.1 State the purpose of coaxial cable 3.1.2 ***Use multimeter***	**3.1 Test BNC connector**	
3.2.1 State the purpose of testing modular jack 3.2.2 ***Use cable tester***	**3.2 Test modular jack**	
3.3.1 State the purpose of LAN cable testing 3.3.2 List the application of cross and straight-thru connection 3.3.3 ***Use LAN tester***	**3.3 Test LAN cable**	

3.4.1 State the purpose of smoke detector 3.4.2 List types of smoke detector 3.4.4 State the purpose testing of fire alarm 3.4.5 Troubleshoot problems associated with smoke detector 3.4.6 ***Operate fire detector***	**3.4 Test fire alarm**	
3.5.1 State the importance of testing burglar alarm 3.5.2 ***Operate burglar alarm***	**3.5 Test burglar alarm**	
3.5.1 State the importance of testing CCTV system 3.5.2 ***Operate CCTV system***	**3.6 Test CCTV**	
MODULE 4: CARRYING OUT DOMESTIC WIRING **Chapter 1:** Prepare wire joints		
1. List types of wires 2. State types of wire joints 3. State the purpose of joints 4. Explain the importance of proper insulation 5. State the consequences of improper joints and insulation 6. State the application of rat tail joints 7. Use of wire stripper 8. Use of soldering iron 9. Use insulation sleeves 10. Be responsible and vigilant while following OHS. **11.** Ensure safe handling of materials and equipment.	**1. Prepare rat tail joint**	
1.2.1 State the application of T-Joints 1.2.2 ***Use wire stripper*** 1.2.3 ***Use Insulation sleeves*** 1.2.4 ***Use soldering iron*** 1.2.5 *Be responsible and vigilant while following OHS* 1.2.6 *Ensure safe handling of materials and equipment.*	**1.2 Prepare T-Joint**	

1.2.1 State the application of Straight Joints 1.2.2 ***Use wire stripper*** 1.2.3 ***Use Insulation sleeves*** 1.2.4 ***Use soldering iron*** 1.2.5 *Be responsible and vigilant while following OHS* 1.2.6 *Ensure safe handling of materials and equipment.*	**1.3 Prepare Straight Joint**	
Chapter 2: Performing Lighting and power circuit wiring		
1. Explain the PVC conduit wiring 2. State electrical sign and symbols 3. List types of house wiring and its application 4. List types of installation rules 5. State advantages and disadvantages of different types of wiring 6. Differentiate between surface and concealed wiring 7. List types of Distribution board (DB) 8. List types of protective switch gears 9. List types of sub- circuit 10. List types of switches 11. List types of sockets 12. List types of holders 13. List types of luminaries/ lamps 14. State colour coding of wire 15. State size of wires and rating 16. List different size of casing capping bit and its accessories ***17. Use wire drawing skills*** ***18. Use spirit level*** ***19. Use drilling machine*** ***20. Interpret circuit drawing***	1. **Perform PVC casing capping wiring for 2 lighting loads**	

21. Ensure safe handling of instruments. 22. Ensure to follow OHS rules and regulations 23. Ensure appropriate use of PPE 24. Ensure proper disposal of waste		
1. Introduce to PVC conduit wiring 2. List lighting and power loads 3. List advantages and disadvantages of PVC Conduit wiring 4. State the application of PVC conduit wiring 5. List types of PVC conduit fitting. 6. List the importance of pre-installation test ***7. Interpret drawings*** ***8. Use drilling machine*** ***9. Use IR tester*** ***10. Use spirit level*** ***11. Wire drawings skills*** 12. *Ensure to follow OHS rules and regulations* 13. *Ensure appropriate use of PPE* 14. *Ensure proper disposal of waste* 15. *Ensure safe handling of instrument.*	**2. Perform PVC conduit wiring for 2 lightings and 1 power load**	
1. Explain the lighting and power load 2. Introduce MS conduit wiring. 3. List the advantages and disadvantages of MS conduit wiring 4. State the application of MS conduit wiring. 5. List the types of MS conduit fitting ***6. Interpret drawings*** ***7. Use drilling machine*** ***8. Use IR tester*** ***9. Use spirit level*** ***10. Wire drawings skills***	**3. Perform MS conduit wiring for 3 lighting and 1 power load**	

11. *Ensure safe handling of materials.* 12. *Ensure to follow OHS rules and regulations* 13. *Ensure appropriate use of PPE* 14. *Ensure proper disposal of waste*		
Chapter 3: Repair Home Appliance		
1. List the types of water boilers. 2. Explain the construction and work principle of a water boiler. 3. Identify and state the function of each component of the water boiler. 4. Read and interpret circuit diagrams of water boiler. 5. Test heat elements, indicator, switch and thermostat of water boiler. 6. Identify the defect of the water boiler.	**1. Repair water boiler**	
1. List the types of geyser. 2. Explain the construction and work principle of geyser. 3. Identify and state the function of each component of the geyser. 4. Read and interpret circuit diagram of geyser. 5. Test heat elements, indicator, switch, and thermostat of geyser. 6. Identify the defect of the geyser.	**2. Repair geyser**	
1. List the types of washing machine. 2. Explain the construction and working principle of the washing machine. 3. Identify and state the function of each component of the washing machine. 4. Interpret circuit diagram of washing machine. 5. Identify the defect of washing machine	**3. Repair washing machine**	
1. List types of electric iron. 2. Explain the construction and working principle of electric iron. 3. Identify and state the function of each component of electric iron.	**4. Repair electric iron**	

4. Interpret circuit diagram of electric iron. 5. Identify the defect of electric iron.		
1. List the types of curry cooker. 2. Explain the construction and working principle of the curry cooker. 3. Interpret circuit diagram of curry cooker. 4. Identify the defect of the curry cooker.	**5. Repair curry cooker**	
1. List the types of rice cooker. 2. Explain the construction and working principle of the rice cooker. 3. Identify and state the function of each component of the rice cooker. 4. Interpret circuit diagram of rice cooker. 5. Identify the defect of the rice cooker.	**6. Repair rice cooker**	
1. Explain the construction and working principle of ceiling fan. 2. Identify and state the function of each component of the ceiling fan. 3. Interpret circuit diagram of ceiling fan. 4. Identify the defect of ceiling fan	**7. Repair ceiling fan**	
1. List the types of electric heater. 2. Explain the construction and work principle of electric heater. 3. Identify and state the function of each component of the electric heater. 4. Interpret circuit diagram of electric heater.	**Repair electric heater**	

Learning objectives	Core concepts (Chapters/Topics)	Class
	Chapter 2: Performing lighting and power circuit wiring	**XII**
1. List types of concealed wiring 2. Explain the advantages and disadvantages of concealed wiring	**1. Lay concealed conduit**	

3. State the application of concealed wiring 4. ***Use drilling machine*** 5. ***Use spirit level*** 6. *Ensure appropriate use of PPE* 7. *Ensure to follow OHS rules and regulations* 8. *Ensure proper disposal of waste*		
1. State the application of stair case wiring 2. State the advantages and disadvantages of stair case wiring 3. State the application of staircase wiring 4. Draw wiring diagram ***5. Use IR tester*** ***6. Use spirit level*** ***7. Use drilling machine*** *8. Interpret drawings* *9. Ensure appropriate use of PPE* *10. Ensure to follow OHS rules and regulations* 11. *Ensure proper disposal of waste*	**2.5 Perform stair case wiring**	
1. State the application of hostel wiring 2. Draw hostel wiring ***3. Use IR tester*** ***4. Use spirit level*** ***5. Use drilling machine*** ***6. Interpret drawings*** 7. *Ensure appropriate use of PPE* *8. Ensure to follow OHS rules and regulations* 9. *Ensure proper disposal of waste*	**2.6 Perform hostel wiring**	
2.7.1 State the application call bell wiring 1. List types of call bell 2. Draw wiring diagram of call bell ***3. Use IR tester*** ***4. Use spirit level*** ***5. Use drilling machine*** ***6. Interpret drawings***	**2.7 Perform call bell wiring**	

7. *Ensure appropriate use of PPE* *8. Ensure to follow OHS rules and regulations* *2.7.9 Ensure proper disposal of waste*		
1. State the application of go-down wiring 2. List the application of godown wiring 3. Draw wiring diagram 4. ***Use IR tester*** 5. ***Use spirit level*** 6. ***Use drilling machine*** 7. ***Interpret drawings*** 8. *Ensure appropriate use of PPE* 9. *Ensure to follow OHS rules and regulations* 10. *Ensure proper disposal of waste*	**2.8 Perform go- down wiring**	
Chapter 3: Perform installation test		
1. State the purpose of IR test 2. State the standard of IR test ***3. Use IR tester*** *4. Ensure appropriate use of PPE* *5. Ensure to follow OHS rules and regulations* *6. Ensure proper disposal of waste* 7. *Ensure correct selection of test voltage*	**3.1Perform IR test**	
1. State the purpose of continuity test 2. State the function of IR tester ***3. Use IR tester*** *4. Ensure appropriate use of PPE* *5. Ensure to follow OHS rules and regulations* *6. Ensure proper disposal of waste* 7. *Ensure correct selection of test voltage*	**3.2 Perform Continuity test**	
1. State the purpose of polarity test **2. Use IR tester** *3. Ensure appropriate use of PPE* *4. Ensure to follow OHS rules and regulations* *5. Ensure proper disposal of waste*	**3.3 Perform polarity test**	

6. *Ensure correct selection of test voltage*		
1. State earth continuity test 2. State the importance of earthing ***3. Use IR tester*** *4. Ensure appropriate use of PPE* *5. Ensure to follow OHS rules and regulations* *6. Ensure proper disposal of waste* ***7.** Ensure correct selection of test voltage*	**3.4 Perform earth continuity test**	
3.5.1 State purpose of earth resistance test 3.5.2 State standard earth resistance for domestic installations 3.5.3 List Methods of testing earth resistance 1. ***Use earth tester*** *2. Ensure appropriate use of PPE* *3. Ensure to follow OHS rules and regulations* *3.5.7 Ensure proper disposal of waste* *3.5.8 Ensure correct selection of test voltage*	**3.5 Perform earth resistance test**	X
3.6.1 State the purpose of soil resistivity test 3.6.2 Calculate the soil resistivity 3.6.3 List methods of soil resistivity test 3.6.4 ***Use IR tester*** *3.6.5 Ensure appropriate use of PPE* 3.6.6 *Ensure to follow OHS rules and regulations* 3.6.7 *Ensure proper disposal of waste*	**3.6 Perform soil resistivity test**	
Chapter 4: Troubleshooting building wiring		
4.1.1 List types of fluorescent tube/LED 4.1.2 Explain the Working principle of fluorescent tube/ LED 4.1.3 List the components of fluorescent tube and its function 4.1.4 State the symptoms, causes and remedies of faults in fluorescent tube 4.1.5 ***Use multi-meter***	**4.1** **Troubleshoot fluorescent lamp/ LED and fitting**	

4.1.6 ***Use test lamp*** 4.1.7 *Ensure to follow OHS rules and regulations* 4.1.8 *Ensure appropriate use of PPE* 4.1.9 *Ensure proper disposal of waste*		
4.2.1 List types of fan 4.2.2 State the function of fan components 4.2.3 Explain the working principle of fan 4.2.4 State the symptoms, cause and remedies of faults in a fan *4.2.5* ***Use multi-meter*** *4.2.6 Ensure OHS rules and regulations* *4..2.7 Ensure to follow PPE*	**4.2 Troubleshoot fan and fitting**	
4.3.1 List types of HID lamp 4.3.2 State the function of HID lamp components 4.3.3 Explain the working principle of HID Lamp 4.3.4 State the Symptoms, causes and remedies of faults in HID lamp and fitting *4.3.5* ***Use Multi-meter*** *4.3.6* ***Interpret circuit diagram*** *4.3.7 Ensure to follow OHS rules and regulations* *4.3.8 Ensure appropriate use of PPE*	**4.3 Troubleshoot High Intensity Discharges (HID) lamp and fitting**	
Chapter 5: Estimate materials		
5.1.1 Introduce to basic estimation and costing 5.1.2 State the purpose of basic estimation and costing 5.1.3 State the methods of basic estimation and costing 5.1.4 Explain the rules for estimation 5.1.5 Explain BSR 5.1.6 Explain Bill of Quantity (BoQ) *5.1.7* ***Interpret drawings*** *5.1.8* ***Interpret Bhutan Schedule of Rates (BSR) and Labour and Material Coefficient (LMC)*** *5.1.9 Being time conscious*	**5.1 Estimating materials for PVC casing and capping wiring**	

5.1.10 Being efficient in using resources		
1. State the methods of estimation and costing 2. List rules for estimation ***3. Interpret drawings*** *4. Being time conscious* *5.2.5 Being efficient in using resources*	**5.2 Estimate materials for Poly Vinyl Chloride (PVC) conduit wiring**	
5.3.1 List methods of estimation and costing 5.3.2 List Rules of estimation 5.3.3 ***Interpret drawing*** 5.3.4 *Being time conscious* *5.3.5 Being efficient in using resources*	**5.3 Estimate materials for Mild steel (MS) conduit wiring**	
5.4.1 List methods of estimation and costing 5.4.2 List rules for estimation 5.4.3 ***Interpret drawing*** 5.4.4 *Being time conscious* *5.4.5 Being efficient in using resources*	**5.4 Estimate materials for concealed HDPE pipe wiring**	

ANNEXURE III: MASONRY

Instructional hours

Class	Module	Chapters	Lessons	Theory (hrs)	Practical (hrs)	Total (hrs)
IX	**Module 1:** Performing brick/block, stone masonry and plastering work	**Chapter1** Practising Occupational Health and Safety (OHS) and Work Safety	1. Apply Principle of 5S	1	1	11
			2. Use PPE	1	1	
			3. Maintain workplace and personal safety	1	2	
			4. Maintain tools and equipment safety	1	1	
			5. Use fire extinguisher	1	1	
		Chapter 2 Preparing for Masonry Work	1. Select masonry tools, equipment, and materials	3	2	21
			2. Identify Building Components	2	2	
			3. Estimate materials	4	8	
		Chapter3 Preparing mortar mix	1. Conduct silt content test	2	2	16
			2. Prepare surface	2	2	
			3. Mix mortar manually	3	2	
			4. Mix mortar mechanically	1	2	
		Chapter 4 Performing brick/blocks masonry work	1. Carry out foundation layout	4	20	57
			2. Conduct compressive test for bricks	3	3	
			3. Cut brick	2	3	
			4. Lay of stretcher bond	2	20	
			5. Engineering Drawing	9	18	27
Total hours						**132**
X	**Module 1:** Performing	**Chapter 4**	1. Lay English bond wall	3	28	126
			2. Lay header bond	3	24	

	brick/block, stone masonry and plastering work	**(Continued)** Performing brick/blocks masonry work	3. Lay Flemish bond	3	25	
			4. Prepare stabilised earth block	4	14	
			5. Lay stabilised earth block wall	4	18	
			Engineering Drawing	2	4	6
Total hours						**132**
XI	**Module 1:** Performing brick/block, stone masonry and plastering work	**Chapter 4 (Continued)** Performing brick/blocks masonry work	1. Provide seismic bands	8	18	108
			2. Lay confined masonry wall	10	46	
			3. Provide pointing	6	20	
		Chapter 5 Performing stone masonry	1. Dress stones manually	6	20	49
			2. Dress stone using a cutting machine	5	18	
			Engineering Drawing	5	30	35
Total hours						**192**
XII	**Module 1:** Performing brick/block, stone masonry and plastering work	**Chapter 5 (Continued)** Performing stone masonry	1. Lay Random Rubble Masonry (RRM) wall	6	36	192
			2. Lay Dry Rubble Masonry (DRM) wall	5	18	
			3. Lay ashlar wall	6	47	
			4. Lay retaining wall	8	48	
			5. Repair brick, block and stone masonry works	4	14	
Total hours						**192**
Engineering Drawing						**68**
Grand Total Hours						**648**

Class-wise Competencies

1. CLASS IX COMPETENCIES

1. Practise OHS procedures in any task for safety.
2. Maintain hand tools and portable power tools for better performance.
3. Operate and use different types of fire extinguishers to combat fire.
4. Select the right tools, materials, and equipment for the right job.
5. Identify different classes of building, their parts, and utilities.
6. Carry out estimation of any work by interpreting drawing and using BSR.
7. Determine the quantity of silt in sand through a silt content test as per the standard procedure.
8. Maintain the levelness and cleanliness of the surface for mixing mortar.
9. Prepare mortar mix manually for various tasks as per the given ratio.
10. Carry out mechanical mortar mixing professionally where mass quantity is required.
11. Carryout foundation layout as per the drawing.
12. Conduct a compressive test for different classes of bricks.
13. Cut brick to different types of bats/closure as per the job requirement.
14. Construct a stretcher bond wall as per the drawing following standard procedure.

2. CLASS X COMPETENCIES

1. Lay English bond wall as per the drawing following standard procedure.
2. Construct header bond walls of different designs as per the drawing procedure.
3. Construct the Flemish bond wall as per the given drawing and requirement.
4. Prepare stabilised earth blocks as required.
5. Lay stabilised earth block wall as required.

3. CLASS XI COMPETENCIES

1. Provide seismic bands as per the design and requirement.
2. Lay confined masonry wall as per the drawing and specification.
3. Provide the different types of pointing as required.
4. Dress the stone manually in the required shape and size as per the job requirements.
5. Dress stone using a cutting machine into a required shape and size as per the job requirements.

4. CLASS XII COMPETENCIES

1. Construct RRM wall as per the drawing and specification following the standard procedures.
2. Construct the DRM wall as required.
3. Lay Ashlar masonry wall as per the drawing and specification.

4. Lay retaining wall as per the design following standard procedure.
5. Repair the different types of masonry defects as per requirement.

Class-wise Competencies for engineering drawing

1) CLASS IX COMPETENCIES

1. Use drawing instruments properly.
2. Layout the drawing sheet as per the given format.
3. Draw different types of lines as per their application.
4. Draw letters and numbers as per the requirement.
5. Provide dimensions as per the requirement.

2) CLASS X COMPETENCIES

1. Draw isometric blocks as per the given procedure.

3) CLASS XI COMPETENCIES

1. Draw orthographic projection as per the standard procedures and dimensions.
2. Draw a building plan for different designs following standard practice.

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	Core concepts (Chapters/Topics)	Class
	MODULE: PERFORMING BRICK/BLOCK, STONE MASONRY AND PLASTERING WORK	**IX**
	Chapter 1: Practising Occupational Health and Safety (OHS) and workshop safety	
1. Define 5S 2. State the purposes of 5S 3. Explain the principle of 5S 4. Define OHS 5. State the importance of OHS 6. Explain the rights for employee 7. State the main causes of accidents 8. State the safety rules	**1. Apply principles of 5S**	

9. *Ensure appropriate use of PPE* 10. *Ensure to refer OHS manual*		
1. Define PPE 2. State the importance of PPE 3. List the categories of PPE 4. *Ensure good care of PPE* 5. *Ensure to wear appropriate PPE* 6. *Ensure not to defective and damaged PPE*	**2. Use PPE**	
1. Define safety precaution 2. List the different types of safety 3. Explain workshop and personal safety 4. State the importance of maintaining a workplace and personal safety 5. Explain the importance of safety signs and symbols 6. Explain the Emergency exit 7. Describe the layout of the workshop 8. *Ensure to follow OHS procedures* 9. *Ensure to keep the workshop clean* 10. *Ensure to ring the alarm bell before the accident spreads over* 11. *Ensure to display safety signs and symbols* 12. *Ensure to use appropriate PPE in workplace* 13. *Ensure to avoid horseplay at workplace* 14. *Ensure to avoid smoking and eating inside the workshop* 15. *Ensure to avoid working under influence of alcohol*	**3. Maintain workplace and personal safety**	
1. Explain tool and equipment safety	**4. Maintain tools and equipment safety**	

2. State the importance of maintaining tool and equipment safety 3. List the dos and don'ts for tool and equipment safety *4. Ensure all the tools are in workable condition* *5. Ensure to keep tools clean and dry, and store them properly after use* *6. Ensure to operate the machine when instructed* *7. Ensure to refer manual prior to operation of tools and equipment*		
1. Define fire extinguisher 2. Label the parts of fire extinguisher 3. Explain the types of fires 4. Explain the types of fire extinguishers 5. State the methods of combating/extinguishing fires *6. Ensure to read the instructions provided on the fire extinguisher* *7. Ensure appropriate use PPE*	**5. Use fire extinguisher**	
Chapter 2: Preparing for masonry work		
✓ State the types of tools and their uses ✓ State the types of materials and their uses ✓ State the types of equipment and their uses ✓ Describe the importance of selecting appropriate tools, material, and equipment ✓ Explain the storage of materials ✓ *Ensure appropriate use of PPE*	1.6. **Select masonry tools, equipment, and materials**	
1. List the different classification of buildings	1.7. **Identify building components**	

2. Label the parts of building components 3. List the utilities and facilities provided in the building *4. Ensure to use appropriate PPE*		
1. Define estimation and costing 2. State the purposes of estimation 3. Name the types of estimation 4. Explain two stages of detailed estimate 5. Methods of estimation 6. Define Bhutan Schedule of Rate and state its uses 7. Describe unit measurement of work 8. Explain the unit conversion of measurement *9. Ensure to interpret drawing and its specification* *10. Ensure to use correct format* *11. Ensure to use BSR as a reference*	**1.8. Estimate materials**	
Chapter 3: Preparing mortar mix		
1. Define sand 2. List the types of sand 3. State the purpose of testing 4. Describe the effect of silt content in the sand 5. State the reason for using salt solution 6. Discuss the methods of reducing silt content 7. Ensure to mix sand and water thoroughly 8. Ensure proper handling of jar/glass/cylinder *9. Ensure to add salt in solution*	**1.7. Conduct silt content test**	
1. Define mortar 2. State the function of mortar 3. List the uses of mortar 4. State the types of mortar	**1.8. Prepare surface**	

5. Identify the tools required for preparing the surface 6. State the requirement of mixing platform 7. Ensure appropriate use PPE *8.* Ensure platform is prepared on the level ground		
1. State the different types of cement 2. State the different types of mix ratio 3. Explain the setting time of cement 4. List the method of measuring the ingredients 5. Methods of preparing mortar mix 6. Calculate the total quantity of mortar *7.* Ensure appropriate use of PPE	**1.9. Mix mortar manually**	
1. Define mixture machine 2. State the function of mixture machine 3. Label the parts of the mixture machine 4. Identify the types of mixture machine 5. Operate mixture machine 6. Ensure proper operation of mixture machine *7.* Ensure appropriate use of PPE	**1.10. Mix mortar mechanically**	
Chapter 4: Performing brick/blocks masonry work		
1. Define foundation 2. State the purpose of a foundation 3. Name the different types of foundation 4. State the requirement of the foundation 5. Define layout and describe its purpose 6. List the methods of layout 7. Calculate using Pythagoras theorem to derive the 3,4,5 method 8. State the terminologies used in a layout	**1.1. Carry out foundation layout**	

9. Define dumpy level 10. Label the parts and state its function 11. Define levelling staff 12. State the precaution while using the dumpy level ***13. Operate dumpy level*** ***14. Use water level pipe*** *15. Ensure proper handling of dumpy level* 16. *Ensure to record the reading* *17. Ensure appropriate use of PPE* *18. Ensure proper handling of water level pipe*		
1. Define brick masonry 2. State the types of brick 3. Classify different classes of bricks 4. Label the parts of brick 5. State the properties of good brick 6. State the importance of soaking the bricks 7. Explain the different types of field test for brick 8. Label the parts of compressive testing machine 9. State the purpose of compressive strength test 10. Explain preparation of brick specimen testing 11. Calculate the compressive strength of brick ***12. Operate compressive testing machine*** *13. Ensure proper handling of the machine* *14. Ensure appropriate use PPE* *15. Ensure to use 2 mm plywood*	**1.1. Conduct compressive test for bricks**	
1. List the types of bats/closure	1.2. **Cut brick**	

2. Explain the importance of soaking the brick before cutting 3. Describe the methods of cutting the bricks *4. Ensure appropriate use of PPE* *5. Ensure proper handling of cutting tools*		
1. List the types of brick bond 2. Differentiate between the bonded and unbonded wall 3. Describe the orientation of bricks 4. Define stretcher bond 5. State the application of stretcher bond 6. Explain the technical terms for brick masonry 7. Calculate the quantity of bricks *8. Ensure appropriate use of PPE* *9. Ensure proper handling of cutting tools*	**1.3. Lay stretcher bond**	
Chapter 4: (Continued Performing brick/blocks masonry work		**X**
1. Define English bond 2. State the advantage of English bond 3. State the application of English bond *4. Ensure proper handling of hand tools* *5. Ensure appropriate use of PPE*	**1.4. Lay English bond**	
1.1.1. Define the header bond 1.1.2. State the application of header bond 1.1.3. *Ensure proper handling of hand tools* 1.1.4. *Ensure appropriate use of PPE* 1.1.5. *Ensure to maintain cleanliness at workplace* 1.1.6. *Ensure to use materials economically* 1.1.7. *Ensure proper storage of surplus materials*	1.5. **Lay header bond**	

1. Define Flemish bond 2. State the application of Flemish bond 3. Differentiate between English and Flemish bond wall *4. Ensure proper handling of hand tools* *5. Ensure appropriate use of PPE* *6. Ensure to maintain cleanliness at workplace* *7. Ensure to use materials economically* *8. Ensure proper storage of surplus materials*	**1.6. Lay Flemish bond**	
1. Define block masonry 2. List the types of blocks 3. Define stabilised earth block 4. List the different sizes of stabilised earth block 5. State the advantages and disadvantages of stabilised earth block 6. Explain the mix proportion 7. Describe different field test for soil 8. Explain the precautions while operating press machine 9. Operate press machine 10. *Ensure to use right amount of water* 11. *Ensure to lubricate inside of the mould* 12. *Ensure appropriate use of PPE* 13. *Ensure to remove blocks without damaging*	**1.1. Prepare stabilised earth block**	
2.2.1 State the application of earth block 2.2.2 Explain the grouting and its importance 2.2.3 Explain the use of reinforcement bar 2.2.4 Explain the finishing work for block wall	1.2. **Lay stabilised earth block wall**	

2.2.5 *Ensure to grout the cores every after 1 m* 2.2.6 *Ensure appropriate use of PPE*		
Chapter 4: (Continued) Performing brick/blocks masonry work		**XI**
2.2.1 Define seismic band 2.2.2 List the types of seismic band 2.2.3 State the purpose of seismic bands 2.2.4 State the advantages and disadvantages of bands 2.2.5 Explain the use of reinforcement concrete bands 2.2.6 Explain the use of timber in seismic 2.2.7 Define concrete 2.2.8 Define formwork *2.2.9* Define reinforcement bar *2.2.10 Ensure appropriate use gloves, helmet, apron and goggles* *2.2.11 Ensure the proper handling of tools* *2.2.12 Ensure cleanliness at a workplace* *2.2.13 Ensure proper storage of surplus materials*	**1.3. Provide seismic bands**	
2.2.2 Define confined masonry 2.2.3 State the purpose of confined masonry 2.2.4 Describe the structural components of a confined masonry building 2.2.5 State the advantages and disadvantages of confined masonry 2.2.6 Describe the standard practices to be followed for confined masonry construction 2.2.7 Differentiate between RC (reinforced concrete) frame structure and confined masonry	**1.1. Lay confined masonry wall**	

2.2.8 *Ensure appropriate use gloves, helmet, apron, and goggles* 2.2.9 *Ensure the proper handling of tools* 2.2.10 *Ensure cleanliness at a workplace* *2.2.11 Ensure economic use of materials* *2.2.12 Exhibit teamwork* *2.2.13 Ensure proper storage of surplus materials*		
1. Define pointing 2. List the types of tools and materials 3. State the types of pointing and their functions 4. State the advantages of pointing over plastering 5. Define curing 6. State the purpose of curing 7. State the methods of curing 8. Describe the duration of curing 9. Explain the effects of poor curing *1. Ensure proper use of pointing tools* *2. Ensure appropriate use gloves, apron, and mask*	3.2. **Provide pointing**	
Chapter 5: Performing stone masonry		
2.2.2 Define stone masonry 2.2.3 State the uses of stone masonry 2.2.4 State the classification of rock 2.2.5 Describe the types of stone used in building construction 2.2.6 Describe the quality and selection of stone 2.2.7 Define stone dressing 2.2.8 Explain the purpose of stone dressing	**1. Dress stones manually**	

2.2.9 Ensure proper handling of dressing tools *2.2.10 Ensure cleanliness at a workplace* *2.2.11 Ensure appropriate use gloves, apron, goggles, and mask*		
2.2.1 Label the parts of the stone cutting machine 2.2.2 State the importance of pouring water while using a cutting machine 2.2.3 Differentiate between manual and mechanical dressing 2.2.4 ***Operate cutting machine*** 2.2.5 *Ensure the proper handling of cutting machine* 2.2.6 *Ensure cleanliness at a workplace* 2.2.7 *Ensure appropriate use gloves, apron, goggles, and mask*	**2. Dress stone using a cutting machine**	
Chapter 5: (Continued) Performing stone masonry		**XII**
1. State the technical terms used in stone masonry 2. Describe the types of stone masonry 3. Define RRM 4. State the applications of RRM wall 5. State the reasons for providing through stones 6. Differentiate between RRM wall and brick wall 7. Estimate materials for RRM wall *8. Ensure proper care and handling of aligning tools* *9. Ensure cleanliness at the workplace* *10. Ensure economic use of materials* *11. Ensure proper storage of surplus materials*	*1.* **Lay Random Rubble Masonry (RRM) wall**	

12. *Ensure appropriate use of gloves, apron, goggles, and mask*		
1. Define DRM wall 2. List the advantages and disadvantages of DRM wall 3. Explain the estimation of materials for DRM wall 4. State the application of DRM wall *5.* Ensure *proper care and handling of aligning tools* *6. Ensure cleanliness at the workplace* *7.* Ensure *economic use of materials* *8.* Ensure *proper storage of surplus materials* 9. Ensure *appropriate use of gloves, apron, goggles, and mask*	**2. Lay Dry Rubble Masonry (DRM) wall**	
1. Define ashlar masonry 2. Describe the types of ashlar masonry 3. Differentiate between RRM and ashlar masonry 4. State the application of ashlar masonry 5. Ensure *proper care and handling of aligning tools* *6.* Ensure *appropriate use gloves, apron, goggles, and mask*	3. **Lay ashlar masonry wall**	
1. Define retaining 2. List the types of retaining wall and their applications 3. Explain the reason for providing weep holes 4. Explain the technique for preparing a wooden profile 5. Explain the importance of backfill in retaining wall	4. **Lay retaining wall**	

6. Interpret drawing and specification of retaining wall 7. Differentiate between breast wall and retaining wall *8.* Ensure *proper use of aligning tools* *9.* Ensure *appropriate use gloves, apron, goggles, and mask*		
3.4.1.1. State the purpose of repairing 3.4.1.2. Describe the types of damage on structures 3.4.1.3. Describe the remedies for defects/damages *3.4.1.4. Ensure proper use of repairing tools* *3.4.1.5. Ensure appropriate use gloves, apron, goggles, and mask*	5. **Repair brick, block and stone masonry works**	

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	**Core concepts (Chapters/Topics)**	**Class**
	MODULE: INTERPRETING ENGINEERING DRAWING	**IX**
1. Define engineering drawing 2. State the purposes of engineering drawing 3. List the types and uses of drawing instruments 4. List the sizes of drawing papers *5. Ensure proper handling of drawing instruments* *6. Ensure proper disposal of waste*	**1. Use drawing instruments**	
1. Define the layout of a drawing sheet 2. Define the title block 3. Layout drawing sheet *4. Ensure to maintain cleanliness and neatness of drawing*	**2. Layout drawing sheet**	

5. *Ensure proper handling of drawing instruments* 6. *Ensure that the sheet edges are not damaged while handling the drawing*		
1. Define sign and symbol 2. Define abbreviation 3. Draw engineering sign, symbol, and abbreviations *4. Ensure to maintain cleanliness and neatness of drawing* *5. Ensure proper handling of drawing instruments*	**3. Interpret engineering signs, symbols and abbreviations**	
1. Define line 2. State the types of line and its application 3. *Ensure proper handling of drawing instrument* 4. *Ensure to maintain cleanliness and neatness of drawing*	**4. Draw different types of lines**	
1. Define lettering and numbering 2. Classify the styles of letters 3. List the types of letters 4. Define freehand lettering 5. List the sizes of letters 6. State the rules for lettering and numbering *1. Ensure proper handling of drawing instruments* *2. Ensure to maintain cleanliness and neatness of drawing*	**5. Draw letters and numbers**	
1. Define dimensioning 2. State the types of dimensioning 3. Explain the system of dimensioning 4. State the terminologies of dimensions 5. State the rules for dimensioning *6. Ensure to maintain cleanliness and neatness of drawing* *7. Ensure proper handling of drawing instruments*	**6. Provide dimension**	
		X
1. Define isometric drawing 2. State isometric terminologies	**1. Draw Isometric blocks**	

3. *Ensure handling of set squares*		
		XI
1. Define orthographic drawing 2. List the four quadrants 3. Explain the six principles view 4. Explain the methods of obtaining six principles view 5. Differentiate between first and third angle projection 6. *Ensure proper handling of drawing instruments* 7. *Ensure proper disposal of waste*	**2. Draw orthographic projection**	
1. Define construction drawing 2. List the types of construction drawing 3. Define the scale for drawing 4. List the types of scale 5. Describe the specification and data 6. *Develop creativity through their own simple drawing plan* 7. *Ensure proper handling of drawing instruments* 8. *Ensure proper disposal of waste*	**3. Draw a simple building plan**	

ANNEXURE IV: PLUMBING

Instructional hours

Class	Module	Chapters	Lessons	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
IX	**Module 1:** Carrying out installation of internal domestic water supply system and sanitary fixtures	**Chapter1** Practising occupational health and safety (OHS) and Personal Protective Equipment (PPE)	1. Apply Principles of 5S	1	3	17
			2. Use Personal Protective Equipment (PPE)	1	2	
			3. Maintain workshop and personal safety	1.5	2	
			4. Maintain tools and equipment safety	0.5	2	

			5. Use fire extinguisher	1	3	
		Chapter 2 Installing pipes and fittings	1. Identify water pipes and fittings	3	2	77
			2. Identify tools and equipment	2	4	
			3. Estimate material	2	18	
			4. Cut pipes	2	27	
			5. Ream/File pipe	1	16	
Interpreting engineering drawing				11	27	38
Total hours						**132**
X	**Module 1: (Continued)** Carrying out installation of internal domestic water supply system and sanitary fixtures	**Chapter 2 (Continued)** Installing pipes and fittings	1. Thread Galvanised Iron (GI) pipe manually	4	18	128
			2. Thread Galvanised Iron (GI) pipe mechanically	3	12	
			3. Perform Galvanized Iron (GI) pipe joint	4	18	
			4. Perform Chlorinated Polyvinyl Chloride (CPVC) pipe joint	2	7	
			5. Perform Polypropylene Random (PP-R) pipe joint	3	10	
			6. Perform Copper (Cu) pipe joint	3	10	
			7. Perform pex pipe joint	2	6	
			8. Perform High Density Polyethylene (HDPE) pipe joint	4	22	
Interpreting engineering drawing				1	3	4
Total hours						**132**

XI	**Module 1: (Continued)** Carrying out installation of internal domestic water supply system and sanitary fixtures	**Chapter 2 (Continued)** Installing pipes and fittings	9. Prepare layout	2	16	86
			10. Cut channel	3	11	
			11. Lay pipes	3	15	
			12. Fix Clamps	2	10	
			13. Conduct Leakage test	2	8	
			14. Perform pipe insulation	4	10	
		Chapter 3 Installing water tanks and pumps	1. Interpret tank drawing	3	5	80
			2. Study site location	3	7	
			3. Prepare tank bedding	3	8	
			4. Fix tank components	2	4	
			5. Mount storage tank	2	6	
			6. Interpret pump drawing	3	6	
			7. Prepare pump layout	2	8	
			8. Construct pump base	1	5	
			9. Assemble pump accessories	1	5	
			10. Test pump	1	5	
Interpreting isometric, orthographic and trade drawing				2	24	26
Total hours						**192**
XII	**Module 1: (Continued)** Carrying out installation of internal domestic water supply system and sanitary fixtures	**Chapter 4** Maintaining pipes and fittings	*1.* Locate fault	3	9	35
			2. Clear pipe blockage	3	7	
			3. Repair defective pipes and fittings	2	7	
		Chapter 5 Installing sanitary fixtures and fittings	1. Identify sanitary fixtures/appliances	3	7	157
			2. Prepare layout	4	19	
			3. Install wash basin	4	14	
			1. Install European Water Closet (EWC) pan	3	14	

			1. Fix cistern	3	10	
			2. Install Asian Water Closet (AWC) pan	4	23	
			3. Fix geyser	3	12	
			4. Fix urinal	3	13	
			5. Fix bathroom accessories	4	14	
Total hours						**192**
Grand Total hours						**648**

INTERPRETING ENGINEERING DRAWING
DRAWING LESSONS

Class	Module	Chapters	Lessons	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
IX	**Module 1: (Continued)** Interpreting engineering drawing	**Chapter 1** Interpreting basic engineering drawing	1. Using drawing instruments	3	3	38
			2. Laying out drawing sheet	2	3	
			3. Interpreting Engineering Signs, symbols, and abbreviation	2	4	
			4. Drawing different types of lines	2	3	
			5. Draw letters and numbers	1	8	
			6. Provide dimensioning	1	6	
X	**Module 1: (Continued)** Interpreting engineeri	**Chapter 2** Interpreting Isometric, orthographic and	1. Drawing of Isometric blocks	1	3	4

	ng drawing	trade drawing				
XI	**Module 1:** **(Continued)** Interpreting engineering drawing	**Chapter 2** Interpreting Isometric, orthographic and trade drawing	1. Drawing Orthographic Projection	1	12	26
			2. Drawing a simple building plan	1	12	
Grand Total hours				**14**	**54**	**68**

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Apply principle of 5s in the workplace.
2. Make appropriate use of PPE in accordance with OHS practices.
3. Maintain workplace and personal safety as per job requirements.
4. Maintain hand tools and portable power tools for better performance.
5. Use a fire extinguisher as per the standard procedure.
6. Identify internal pipes and fittings as per the job requirements.
7. Identify the right tools and equipment for a particular job.
8. Carry out estimating and costing as per the standard format using BSR and drawing.
9. Cut pipe in square as per the given measurement.
10. Ream the edge of the pipe as per standard practices.

2) CLASS X COMPETENCIES

1. Thread pipe manually as per the job requirement.
2. Thread pipe mechanically as per the job requirement.
3. Perform Galvanized Iron (GI) pipe joint using appropriate jointing compound following the standard procedures.
4. Perform Chlorinated Polyvinyl Chloride (CPVC) pipe joint as per the job requirement following standard procedures.
5. Perform Polypropylene Random (PPR) pipe joint as per the job requirement following standard procedures.

6. Perform Copper (Cu) pipe joint as per the standard practices.
7. Perform pex pipe joint as per the job requirement following standard procedures.
8. Perform High Density Polyethylene (HDPE) pipe joint as per the job requirement following standard procedures.

3) CLASS XI COMPETENCIES

1. Prepare layout as per the drawing using standard dimensions.
2. Cut channel to lay pipes as per job requirement.
3. Lay pipes as per the drawing following standard practices.
4. Fix clamp to secure pipes as per job requirement.
5. Conduct leakage test in the pipeline as per job requirement.
6. Insulate pipe as per the standard practice.
7. Interpret tank drawing as per the standard practice.
8. Study site location as per the capacity of the tank.
9. Prepare tank bedding as per the standard practices.
10. Fix tank components as per the standard practices.
11. Mount storage tank as per the job requirement.
12. Interpret pump drawing as per the standard practice.
13. Prepare pump layout using 3-4-5 method.
14. Construct pump base as per the job requirement.
15. Assemble pump accessories as per the standard practice.
16. Test pump as per the standard practice.

4) CLASS XII COMPETENCIES

1. Locate faults in the pipeline as per the job requirement.
2. Clear pipe blockage as per the requirement.
3. Repair defective pipe and fittings as per the requirement.
4. Identify sanitary fixtures/appliances as per the requirement.
5. Prepare layout as per the drawing using standard dimensions.
6. Install wash basin as per the standard practices.
7. Install European Water Closet (EWC) pan as per the standard practices.
8. Install cistern as per the standard practices.
9. Install Asian Water Closet (AWC) pan as per the standard practices.
10. Geyser is fixed as per the job requirement following standard procedures.
11. Urinal is fixed as per the job requirement following standard procedures.

12. Fix bathroom accessories as per the standard practices.

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	Core concepts (Chapters/Topics)	Class
	MODULE 1: CARRYING OUT INSTALLATION OF INTERNAL DOMESTIC WATER SUPPLY SYSTEM AND SANITARY FIXTURES **Chapter 1: Practising Occupational Health and Safety (OHS) and Personal Protective Equipment (PPE)**	**IX**
1. Define 5S 2. State the purpose of 5S 3. Explain the principle of 5S 4. Define OHS 5. State the importance of OHS 6. Explain the rights of employee 7. List the main causes of accidents 8. State the safety rules in construction site	**1. Apply principles of 5S**	
1. Define PPE 2. State the importance of PPE 3. List down respiratory and non-respiratory PPE *4. Ensure not to use defective and damaged PPE*	**2. Use PPE**	
1. Define safety precaution 2. Explain the importance of safety signs and symbols 3. List the different types of safety 4. Explain workshop and personal safety 5. State the importance of maintaining workplace and personal safety 6. Explain the emergency exit 7. Describe the layout of the workshop 8. *Ensure to follow OHS procedures*	**3. Maintain workshop and personal safety**	

9. *Ensure to keep the workshop clean* 10. *Ensure to ring the alarm bell before the accident spreads over* 11. *Ensure to display safety signs and symbols* 12. *Ensure to use appropriate PPE in workplace* 13. *Ensure to avoid horseplay at workplace* 14. *Ensure to avoid smoking and eating inside the workshop* 15. *Ensure to avoid working under influence of alcohol*		
1. Explain tools and equipment safety 2. State the importance of maintaining tools and equipment safety 3. List dos and don'ts of tools and equipment 4. *Ensure all the tools are in workable condition* 5. *Ensure to keep tools clean and dry and store them properly after use* 6. *Ensure to operate the machine when instructed* 7. *Ensure to refer manual prior to operation of tools and equipment*	**4. Maintain tools and equipment safety**	
1. Define fire extinguisher 2. Label the parts of fire extinguisher 3. Explain the types of fire 4. List types of fire extinguishers 5. State the method of combating/extinguishing fires 6. *Ensure to read the instructions provided on the fire extinguisher* 7. *Ensure appropriate use PPE*	**5. Use fire extinguisher**	
Chapter 2: Install internal pipes and fittings		
1. Define pipe 2. Explain the types of internal pipes and their uses	***1.*** **Identify water pipes and fittings**	

3. Explain the types of internal fittings and their uses 4. State the advantages and disadvantages of different pipe 5. *Ensure proper handling of pipes and fittings* 6. *Ensure good housekeeping* 7. *Ensure appropriate use of PPE*		
1. Define tools and equipment 2. Explain the types of tools and their uses 3. Explain the types of equipment and their uses *4. Ensure proper handling of tools and equipment* 5. *Ensure good housekeeping* 6. *Ensure appropriate use of PPE*	**2. Identify tools and equipment**	
1. Define estimation and costing 2. Explain the importance of estimation and costing 3. List the data required for estimation 4. Explain different methods of estimation *5. Ensure to use current BSR* 6. *Ensure correct interpretation of drawing* 7. *Ensure proper disposal of waste*	*3.* **Estimate materials**	
1. List the types of marking tools 2. Explain the importance of correct body positioning while cutting pipe 3. Explain the importance of maintaining hacksaw blade in forward direction 4. Differentiate between pipe cutter and hacksaw 5. Explain the purpose of applying lubricant 6. Label the parts of cutting tools 7. Label the parts of different vices ***8. Set hacksaw*** 9. *Ensure safe handling of tools and materials*	**4. Cut pipe**	

10. *Ensure good housekeeping* 11. *Ensure appropriate use of PPE* 12. *Ensure proper disposal of waste*		
1. Define reamer and file 2. List the type of reamers 3. Label the parts of reamer 4. Explain the importance of checking thickness of the pipe edge while reaming 5. Explain the different type of files 6. Explain the purpose filing pipe 7. ***File pipe*** 8. *Ensure safe handling of tools* 9. *Ensure appropriate use of PPE* 10. *Ensure proper disposal of waste*	**5. Ream/File pipe**	
Chapter 2: Install internal pipes and fittings		**X**
1. Define threading 2. List the types of manual threading tools 3. Label the parts of die stock 4. Differentiate between die stock and ratchet die set 5. Explain the causes of defective thread. 6. State the purpose of applying lubricant ***7. Set die stock*** ***8. Use ratchet die set*** 9. *Ensure proper handling of die stock and ratchet die set* 10. *Ensure appropriate use of PPE* 11. *Ensure proper disposal of waste*	**6. Thread Galvanized Iron (GI) pipe manually**	
1. Explain the types of electric threading machine and their features 2. Label the parts of the threading machine 3. Differentiate between threading pipe manually and mechanically ***4. Set universal threading machine*** 5. *Ensure appropriate use of PPE*	*7.* **Thread Galvanized Iron (GI) pipe mechanically**	

6. *Ensure proper handling of equipment* 7. *Ensure proper disposal of waste* *8. Ensure to be patient while threading*		
1. Define GI pipe 2. Explain the classification of GI pipe 3. List the characteristics and properties of GI pipe and fittings 4. List the available sizes of GI pipe 5. State the advantages and disadvantages of GI pipe and fittings 6. State the application of GI pipe 7. Explain the types of jointing compound and its application 8. Explain the purpose of applying jointing compound 9. Define Z-Dimension 10. Calculate Z-dimension ***11. Wrap jute*** 12. *Ensure appropriate use of PPE* 13. *Ensure economic use of materials* 14. *Ensure proper handling of tools* 15. *Ensure proper disposal of waste* *16. Ensure to use of accurate jointing compound*	**8. Perform Galvanized Iron (GI) pipe joint**	
1. Define CPVC pipe 2. Explain the characteristics and properties of CPVC pipes and fittings 3. List the available sizes of CPVC pipe 4. List the jointing compound used for CPVC pipes and fittings 5. List the advantages and disadvantages of CPVC pipe and fittings 6. State the importance of trial fitting 7. State the application of CPVC pipe 8. *Ensure economic use of materials* 9. *Ensure appropriate use of PPE* 10. *Ensure proper disposal of waste*	*9.* **Perform Chlorinated Polyvinyl Chloride (CPVC) pipe joint**	

1. Define PP-R pipe 2. State the characteristics and properties of PP-R pipe and fittings 3. List the available sizes of PPR pipe 4. Explain the advantages and disadvantages of PP-R pipes and fittings 5. State the application of PP-R pipe 6. Explain the importance of maintaining correct temperature of PP-R welding machine 7. *Ensure proper handling of PP-R Bud welding machine* 8. *Ensure economic use of materials* 9. *Ensure to follow OHS* 10. *Ensure appropriate use of PPE*	**10. Perform Poly Propylene - Random (PP-R) pipe joint**	
1. Define Cu pipe 2. State the types of Cu pipe 3. State the dimension of Cu pipe 4. Explain the advantages and disadvantages of copper pipe 5. Explain the methods of joining Cu pipe 6. State the application of Cu pipe 7. *Ensure appropriate use of PPE* 8. *Ensure economic use of materials* **9.** *Ensure proper disposal of waste*	**11. Perform Copper (Cu) pipe joint**	
1. Define pex pipe 2. List the available sizes of pex pipe 3. State the advantages and disadvantages of pex pipe 4. Explain the methods of joining pex pipe 5. State the application of pex pipe 6. *Ensure appropriate use of PPE* 7. *Ensure economic use of materials* 8. *Ensure proper disposal of waste*	**1. Perform pex pipe joint**	
1. Define HDPE pipe 2. Explain the characteristic of HDPE pipe	**2. Perform High Density Polyethylene (HDPE) pipe joint**	

3. State the advantages and disadvantages of HDPE pipe 4. List the available sizes of HDPE pipe 5. Explain the methods of joining HDPE pipe 6. Explain the importance of maintaining correct temperature of heating plate 7. State the application of HDPE pipe 8. ***Use manual heating plate*** 9. ***Use butt-welding machine*** 10. *Ensure proper handling of heating plate* 11. *Ensure proper disposal of waste* 12. *Ensure appropriate use of PPE*		
Chapter 2: Install internal pipes and fittings		**XI**
1. Define layout 2. List the types of layout tools, equipment, and materials 3. State the importance of preparing layout 4. State the importance of checking alignment 5. Explain the importance of checking power cables before preparing layout ***6. Use water level*** 7. *Ensure correct interpretation of drawing* 8. *Ensure appropriate use of PPE* 9. *Ensure proper handling of tools and equipment*	*3.* **Prepare layout**	
1. Explain method of cutting channel 2. State the purpose of channelling 3. State the consequences of irregular cutting of channel 4. List the types of channel cutting tools and equipment ***5. Use tile cutter machine*** 6. *Ensure proper handling of tools and equipment* 7. *Ensure appropriate use of PPE*	**4. Cut channel**	

8. *Ensure proper disposal of waste*		
1. Explain the methods of laying pipe 2. State the importance of trail fitting 3. Explain the importance of laying hot and cold-water line in parallel 4. State the consequences of improper laying of pipe 5. Calculate the loading values and dimensioning 6. *Ensure proper handling of tools and materials* 7. *Ensure appropriate use of PPE* 8. *Ensure proper disposal of waste*	5. **Lay pipeline**	
1. Define clamp and dowel 1. List the types of clamps and dowels 2. Explain the purpose of fixing clamp 3. State the right position/place for fixing clamp ***4. Use drilling machine*** 5. *Ensure proper handling of drilling machine* 6. *Ensure economic use of materials* 7. *Ensure appropriate use of PPE*	**2.17 Fix clamps**	
1. State the types of pressure testing equipment 1. Label the parts of hydrostatic pressure testing machine 2. Explain the methods of checking leakage 3. State the purpose of pressure gauge 4. State the importance of removing air from test line 5. *Ensure proper handling of pressure testing device* 6. *Ensure appropriate use of PPE*	**2. Conduct leakage test**	
1. Define insulation 1. Explain the purpose of insulating pipe	3. **Perform pipe insulation**	

2. List the types of pipe insulation materials 3. List the types of binding materials 4. *Ensure proper handling of materials* 5. *Ensure proper disposal of waste* 6. *Ensure appropriate use of PPE*		
Chapter 3: Install water tanks and pumps		
1. List the signs and symbols for the storage tank and its components. 2. Label the different components of the tank. 3. *Ensure correct interpretation of drawing.*	***1.*** **Interpret tank drawing**	
1. Explain the importance of studying site location 2. Explain the types of report writing 3. State the purpose of writing report 4. *Ensure proper handling of equipment* 5. *Ensure appropriate use of PPE*	***2.*** **Study site location**	
1. Define bedding 2. Explain the types of bedding 3. Explain the purpose of tank bedding 4. *Ensure proper handling of tools and materials* 5. *Ensure appropriate use of PPE*	**3. Prepare tank bedding**	
1. Define storage tank *2.* List the types of storage tank *3.* List the components of storage tank and their function *4.* Explain working principal of float valve *5.* State the advantages and disadvantages of different storage tank 6. Calculate the size and capacity of tank *7. Ensure proper handling of tools and equipment* *8. Ensure economic use of materials*	**4. Fix tank components**	

9. *Ensure appropriate use of PPE*		
1. List the types of valves and their application 2. State the function of union 3. Explain the purpose of using vent pipe 4. Explain the importance of checking leakage 5. Explain the importance of checking flow direction of gate valve 6. *Ensure proper handling of storage tank* 7. *Ensure appropriate use of PPE*	***5.*** **Mount storage tank**	
1. List the types of signs and symbols of pump and its accessories 2. Explain the importance of referring drawing 3. *Ensure good housekeeping* 4. *Ensure correct interpretation of drawing* 5. *Ensure safe handling of drawing*	***6.*** **Interpret pump drawing**	
1. State the methods of preparing layout 2. Explain the Pythagoras theorem 3. *Ensure proper handling of tools and material* 4. *Ensure appropriate use of PPE*	**7. Prepare pump layout**	
1. Explain the different types of foundation 2. State the purpose of soling 3. State the difference between Plain Cement Concrete (PCC) and Reinforced Cement Concrete (RCC) 4. ***Perform concreting work*** 5. *Ensure proper handling of tools and equipment* 6. *Ensure appropriate use of PPE*	***8.*** **Construct pump base**	
1. Define water pump and state its function 2. List the types of water pump 3. Label the parts of the water pump 4. State the working principle of water pump	**9. Assemble pump accessories**	

5. List the advantages and disadvantages of different pumps 6. Explain the purpose of using check/foot valve 7. *Ensure proper handling of tools and equipment* 8. *Ensure appropriate use of PPE*		
1. Explain the importance of priming 2. Explain dos and don'ts while installing pump 3. State the causes and remedies of defects in water pump 4. Calculate head discharge 5. *Ensure proper handling of tools and equipment* 6. *Ensure to use appropriate PPE*	**10. Test pump**	
Chapter 4: Maintain pipes and fittings		**XII**
1. List the different types of faults 2. Explain the causes and remedies of pipeline faults 3. *Ensure appropriate use of PPE*	***1.*** **Locate fault**	
1. State the causes of pipe blockage 2. List the types of block clearing tool 3. *Ensure proper handling tools, materials and equipment* 4. *Ensure appropriate use of PPE*	***2.*** **Clear pipe blockage**	
1. Explain the causes and remedies of defective pipelines 2. Explain the causes and remedies of defective fittings 3. *Ensure proper handling of tools, materials and equipment* 4. *Ensure appropriate use of PPE*	***3.*** **Repair defective pipes and fittings**	
Chapter 5: Install sanitary fixtures and fittings		
1. Define sanitary fixture	**1. Identify sanitary fixtures/appliances**	

2. List the types of sanitary fixtures and their uses 3. State the importance of checking defects *4. Ensure proper handling of materials*		
1. List the signs and symbols of sanitary fixtures 2. List the standard dimensions of sanitary fixtures 3. State the appropriate location of sanitary fixtures 4. Explain the importance of technical drawing ***5. Use laser level*** *6. Ensure safe handling of tools and equipment* *7. Ensure to use PPE*	**2. Prepare layout**	
1. Define wash basin 2. Explain different types of wash basin 3. List the components of wash basin ***4. Fix basin mixer*** 5. *Ensure safe handling of tools and materials* *6. Ensure to use PPE*	**3. Install wash basin**	
1. Define EWC pan 2. Explain types of EWC pan 3. State advantages and disadvantages of using EWC pan 4. Define trap 5. List the types of traps and their uses 6. *Ensure safe handling of tools and materials* *7. Ensure to use PPE*	**4. Install European Water Closet (EWC) pan**	
1. Define cistern 2. Explain the types of cisterns 3. State the differences between manual and automatic flushing cistern	**5. Fix cistern**	

4. Label the parts of cistern and explain it's working principle 5. *Ensure safe handling of tools and materials* 6. *Ensure to use PPE*		
1. List the types of AWC pan 2. Explain the importance of providing bedding 3. State the purpose of applying mortar/adhesive around the joints 4. State the advantages and disadvantages of AWC pan 5. ***Construct brick wall*** 6. *Ensure safe handling of tools and materials* 7. *Ensure to use PPE*	**6. Install Asian Water Closet (AWC) pan**	
1. Define geyser 2. Explain the types of geysers 3. State the advantages and disadvantages of geyser 4. Explain the components of geysers 5. State the location of geyser 6. *Ensure safe handling of tools, equipment and materials* 7. *Ensure to use PPE*	**7. Fix geyser**	
1. Define urinal 2. Explain the types of urinals and their applications 3. *Ensure safe handling of tools, equipment and materials* 4. *Ensure to use PPE*	**8. Fix urinal**	
1. Define bathroom accessories 2. State the types of bathroom accessories and their uses 3. List the standard dimensioning for bathroom accessories 4. *Ensure safe handling of tools and materials*	**9. Fix bathroom accessories**	

5. *Ensure to use PPE*		

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Use a drawing instrument as per the requirement.
2. Layout the drawing sheet as per the standard format.
3. Interpret engineering signs, symbols and abbreviations as per the drawing.
4. Draw lines as per the standard practices.
5. Draw letters and numbers as per the given scale.
6. Provide dimensions as per standard practices.

2) CLASS X COMPETENCIES

1. Draw isometric block as per the given dimensions following standard procedure.

3) CLASS XI COMPETENCIES

1. Draw orthographic projections as per the standard practices.
2. Draw a simple building plan as per the requirement.

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills in table format

Learning objectives	Core concepts (Chapters/Topics)	Class
	Chapter 1: Interpreting Basic Engineering Drawing	**IX**
1. Define Engineering Drawing 2. State the purposes of engineering drawing 3. List the types and uses of drawing instruments 4. List the sizes of drawing papers *5. Ensure proper handling of drawing instruments* *6. Ensure proper disposal of waste*	**1. Use drawing instruments**	
1. Define layout of drawing sheet 2. Define title block *3. Ensure to maintain cleanliness and neatness of drawing* *4. Ensure proper handling of drawing instruments*	**2. Layout drawing sheet**	

5. *Ensure that the sheet edges are not damaged while handling the drawing*		
1. Define sign and symbol 2. Define abbreviation *3. Ensure to maintain cleanliness and neatness of drawing* 4. *Ensure proper handling of drawing instruments*	**3. Interpret engineering Sign, symbols and abbreviation**	
1. Define line 2. State the types of line and its application *3. Ensure proper handling of drawing instrument* 4. *Ensure to maintain cleanliness and neatness of drawing*	**4. Draw different types of lines**	
1. Define lettering and numbering 2. Classify the styles of letters 3. List the types of letters 4. Define freehand lettering 5. List the sizes of letters 6. State the rules for lettering and numbering	**5. Draw letters and numbers**	
1. Define dimensioning 2. State the types of dimensioning 3. Explain the system of dimensioning 4. State the terminologies of dimensions 5. State the rules for dimensioning *6. Ensure proper handling of drawing instruments* *7. Ensure to maintain cleanliness and neatness of drawing*	**6. Provide dimension**	
Chapter 2: Interpreting Isometric, orthographic and trade drawing		X
1. Define isometric drawing 2. State isometric terminologies 3. *Ensure handling of set squares*	**2. Draw Isometric blocks**	
Chapter 2: Interpreting Isometric, orthographic and trade drawing		XI
1. Define orthographic drawing 2. Draw six principle views 3. Explain the methods of obtaining six principle views	**3. Draw orthographic projection**	

4. Explain four quadrant with the help of drawing 5. Differentiate between first and third angle projection 6. *Ensure proper handling of drawing instruments* 7. *Ensure proper disposal of waste*		
1. Define building drawing 2. List the types of building drawing 3. Define the scale for drawing 4. List the types of scale 5. ***Develop creativity through their own simple drawing plan*** 6. *Ensure proper handling of drawing instruments* 7. *Ensure proper disposal of waste*	**4. Draw a simple building plan**	

ANNEXURE V: WELDING

Instructional hours

Class	Module	Topics/Chapter	Lessons	Nominal Duration (Hrs)
IX	**Module 1:** Carrying out Shielded Metal Arc Welding (SMAW)	**Chapter 1:** Practising Occupational Health and safety (OHS) and workshop safety	1. Apply principles of 5S 2. Use Personal Protective Equipment (PPE) 3. Maintain workplace and personal safety 4. Maintain tools and equipment safety. 5. Use fire extinguisher	17
		Chapter 2: Performing setup for SMAW process	1. Prepare base metal 2. Set up SMAW machine 3. Set up base metal	44
		Chapter 3: Performing SMAW on plate	1. Perform stringer bead in flat position 2. Perform weaving bead in flat position 3. Perform fillet weld in flat position(1F)	57

		Interpreting basic engineering drawing	1. Use the drawing instrument 2. Lay out drawing sheet 3. Draw engineering signs, symbols and abbreviations 4. Draw types of lines 5. Draw a letter and number 6. Provide dimensions	14
			Total hours	**132**
X	**Module 1:** Carrying out Shielded Metal Arc Welding (SMAW) (Continued)	**Chapter 3: (Continued)** Performing SMAW on plate	4. Perform groove weld in flat position(1G) 5. Perform fillet weld in horizontal position(2F) 6. Perform groove weld in horizontal position(2G) 7. Perform fillet weld in vertical position(3F) 8. Perform groove weld in vertical position(3G) 9. Perform fillet weld in overhead position(4F) 10. Perform groove weld in overhead position(4G)	105
		Drawing isometric and mechanical parts	2.1 Covert scale for drawing 2.2 Draw isometric blocks 2.3 Draw an orthographic projection	27
			Total hours	**132**
XI	**Module 1:** Carrying out Shielded Metal Arc Welding (SMAW) (Continued)	**Chapter 4:** Performing SMAW on pipe	1. Perform fillet weld in horizontal rolled position(1F) 2. Perform groove weld in horizontal rolled position(1G) 3. Perform groove weld in vertical fixed position(2G) 4. Perform fillet weld in horizontal fixed position(5F)	111

			5. Perform groove weld in horizontal fixed position(5G)	
		Chapter 5: Performing arc cutting/gouging	1. Set up arc cutting/gouging equipment 2. Perform arc cutting 3. Perform arc gouging	32
		Chapter 6: Performing post SMAW	1. Perform penetrant test (PT) 2. Perform finishing work 3. Compiling work completion report	22
		Engineering drawing	3.1 Draw isometric views for different joints 3.2 Interpret simple mechanical drawing 3.3 Draw mechanical machine parts	27
			Total hours	**192**
XII	**Module 2:** Carrying out Oxy-Acetylene Processes	**Chapter 1:** Performing set up for Oxy-acetylene welding	1. Prepare base metal 2. Set up oxy-acetylene welding equipment 3. Perform flame setting for oxy-acetylene welding 4. Setup base metal	27
		Chapter 2: Performing oxy-acetylene welding	1. Perform straight line bead without filler rod 2. Perform straight line bead with filler rod 3. Weld fillet joint in flat position(1F) 4. Weld butt joint in flat joint(1G) 5. Weld fillet joint in horizontal position(2F)	92

			6. Weld butt joint in horizontal position(2G) 7. Weld fillet joint in vertical position(3F) 8. Weld butt joint in vertical position(3G)	
		Chapter 3: Performing oxy-acetylene cutting	1. Set up oxy-acetylene cutting equipment 2. Perform flame setting for oxy-acetylene cutting 3. Prepare base metal 4. Perform straight cutting 5. Perform angle cutting 6. Perform profile cutting	39
		Chapter 4: Performing brazing	1. Prepare base metal 2. Set up base metal 3. Braze the work piece	18
		Chapter 5: Performing post work for oxy-acetylene processes	1. Perform visual inspection of finished work piece 2. Maintain oxy-acetylene equipment **3.** Compile work completion report	16
			Total Hours	**192**
			Grand Total	**648**

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Apply Principles of 5S in any task for safety
2. Use Personal Protective Equipment (PPE) in every task
3. Maintain workplace and personal safety as per OHS standard
4. Maintain hand tools and portable power tools for better performance
5. Use different fire extinguishers to combat different classes of fires
6. Prepare base metal as per the standard procedure
7. Set up SMAW machine as job requirement

8. Set up base metal as per the job requirement
9. Perform stringer bead in flat position as per standard procedure
10. Perform weaving bead in flat position as per standard procedure
11. Perform fillet weld in flat position(1F) as per standard procedure

2) CLASS X COMPETENCIES

1. Perform groove weld in flat position(1G)
2. Perform fillet weld in horizontal position(2F)
3. Perform groove weld in horizontal position(2G)
4. Perform fillet weld in vertical position(3F)
5. Perform groove weld in vertical position (3G)
6. Perform fillet weld in overhead position(4F)
7. Perform groove weld in overhead position(4G)

3) CLASS XI COMPETENCIES

1. Perform fillet weld in horizontal rolled position(1F)
2. Perform groove weld in horizontal rolled position(1G)
3. Perform groove weld in vertical fixed position(2G)
4. Perform fillet weld in horizontal fixed position(5F)
5. Perform groove weld in horizontal fixed position (5G)
6. Set up arc cutting /gouging equipment
7. Perform arc cutting
8. Perform arc gouging
9. Perform Penetrant Test (PT)
10. Perform finishing work
11. Compile work completion report

4) CLASS XII COMPETENCIES

1. Prepare base metal for Oxy-acetylene welding
2. Set up oxy-acetylene welding equipment
3. Perform flame setting for oxy-acetylene welding
4. Setup base metal for oxy-acetylene welding
5. Perform straight line bead without filler rod
6. Perform straight line bead with filler rod
7. Weld fillet joint in flat position(1F)

8. Weld butt joint in flat joint(1G)
9. Weld fillet joint in horizontal position(2F)
10. Weld butt joint in horizontal position(2G)
11. Weld fillet joint in vertical position(3F)
12. Weld butt joint in vertical position(3G)
13. Set up oxy-acetylene cutting equipment
14. Perform flame setting for oxy-acetylene cutting
15. Prepare base metal for oxy-acetylene cutting
16. Perform straight cutting
17. Perform angle cutting
18. Perform profile cutting
19. Prepare base metal for brazing
20. Set up base metal for brazing
21. Braze the workpiece as per standard procedure
22. Perform visual inspection of finished work piece oxy-acetylene processes
23. Maintain oxy-acetylene equipment
24. Compile work completion report

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	**Core concepts (Chapters/Topics)**	**Class**
	Chapter1. Practising Occupational Health and Safety (OHS)	**IX**
3.7.1. Define 5s. 3.7.2. State the purposes of 5S. 3.7.3. Explain the principles of 5s 3.7.4. Define OHS. 3.7.5. State the importance of OHS. 3.7.6. Explain the rights of the employee. 3.7.7. State the main causes of accidents. 3.7.8. Explain the safety rules. 3.7.9. *Ensure appropriate use of PPE*	**1. Apply principles of 5S**	

1. Define PPE. 2. State the importance of PPE. 3. List the categories of PPE. *4. Ensure to use appropriate PPE.* *5. Ensure safe disposal of damage PPE.* 6. *Ensure not to use defective and damaged PPE*	**2. Use Personal Protective Equipment (PPE)**	
1.1.1. Define safety precautions. 1.1.2. List the different types of safety. 1.1.3. Explain workshop and personal safety. 1.1.4. State the importance of maintaining a workplace and personal safety. 1.1.5. Explain the importance of safety signs and symbols. 1.1.6. Explain the emergency exit. 1.1.7. Describe the layout of the workshop. 1.1.8. *Ensure to follow OHS procedures.* 1.1.9. *Ensure to keep the workshop clean.* 1.1.10. *Ensure to ring the alarm bell before the accident spreads over.* 1.1.11. *Ensure to display safety signs and symbols.* 1.1.12. *Ensure to use appropriate PPE in the workplace.* 1.1.13. *Ensure to avoid horseplay at workplace.* 1.1.14. *Ensure to avoid smoking and eating inside the workshop.* 1.1.15. *Ensure to avoid working under the influence of alcohol.*	3. **Maintaining workplace and personal safety**	
1. Explain tools and equipment safety 2. State the importance of maintaining tools and equipment safety. 3. List the dos and don'ts of tools and equipment.	**4. Maintain tools and equipment safety**	

4. *Ensure all the tools are in workable condition.* 5. *Ensure to keep tools clean and dry, and tore them properly after use.* 6. *Ensure to operate the machine when instructed.* 7. *Ensure to refer to manuals prior to operation of tools and equipment.*		
1. Define a fire extinguisher. 2. Label the parts of a fire extinguisher. 3. Explain types/classes of fire. 4. List the types of fire extinguishers. 5. State the methods of combating/extinguishing fires. 6. *Ensure to read the instructions provided on the fire extinguisher.* 7. *Ensure appropriate use of PPE.*	**5. Use fire extinguisher**	
Chapter 2: Setup arc welding		
1.1.1. Define voltage, current, resistance, and their unit. 1.1.2. Identify the conductor, insulator and parallel circuits. 1.1.3. Explain the differences between AC & DC current. 1.1.4. Explain the electrical phases. 1.1.5. Explain the capacity and functions of MCB. **1.1.6. *Use tester.*** 1.1.7. *Ensure proper handling of tools, equipment, and material.* 1.1.8. *Ensure the main supply switch is off while performing electrical connection.* 1.1.9. *Ensure the electrical connection is free from water.*	**1. Perform the basic electrical connection**	

1. Define Arc welding. 2. Describe the arc welding machine. 3. List different types of welding machine. 4. Explain arc welding accessories and their function. 5. Explain the working principle of the welding machine. 6. State the current carrying capacity of the welding machine. ***7. Use spanner/wrench.*** *8. Ensure appropriate use of PPE.* *9. Ensure the main supply switch and the machine are properly earthed.* *10. Ensure to safeguard against work hazards.*	**2. Set up the arc welding machine**	
1. Define electrical terms. 2. Explain all safety measures associated with the test operation of the welding machine. *3. Ensure appropriate use of PPE.* *4. Ensure the electrode holder does not contact the earth cable when the machine is in ON mode.*	**3. Test operation of welding machine**	
Chapter 3: Carry out arc welding		
1.1.1. Explain basic metallurgy. 1.1.2. Explain the types of edge preparation and its purposes. **1.1.3.** State the types of file, their functions and classification. **1.1.4.** Identify the types of a hacksaw and their functions. 1.1.5. Describe high-speed cutter. 1.1.6. Describe angle grinder. **1.1.7.** ***Use hacksaw.*** **1.1.8.** ***Use high-speed cutter.***	**1. Prepare base metal**	

1.1.9. ***Use file.*** **1.1.10.** ***Use angle grinder.*** 1.1.11. *Ensure safe handling of tools, materials, and equipment.* 1.1.12. *Ensure proper disposal of waste material.* 1.1.13. *Ensure appropriate use of PPE.*		
1. Demonstrate the technique to align base metal. 2. Explain the distortion preventive measures. ***3. Use jigs and fixtures.*** *4. Ensure proper use of jigs and fixtures.* *5. Ensure proper alignment of work piece.*	**2. Align the workpiece**	
1. Explain the striking of an arc. 2. Explain the types of striking methods. 3. Define arc length. 4. Explain different types of arc length and its effect. 5. Explain the current setting and its importance. *6. Ensure to maintain the correct arc length.* *7. Ensure proper handling of electrode and electrode holder.* *8. Ensure to maintain the exhaust system in the workshop.* *9. Ensure appropriate use of PPE.*	**3. Maintain arc length**	
1. Explain electrode angle and its importance. 2. State the types and coding of the electrode. 3. Identify welding symbols and its application. *4. Ensure efficient use of electrodes.* *5. Ensure proper handling of electrode and electrode holder.* *6. Ensure appropriate use of PPE.*	**4. Maintain electrode angle**	
Chapter 3: Carry out arc welding		X

1. Identify types of welding beads. 2. State the application and purpose of surface build up. 3. Explain types of welding defects and its remedial action. 4. Demonstrate metal surface build-up technique. ***5. Maintain straight line welding beads.*** *6. Ensure proper handling of electrode and electrode holder.* *7. Ensure proper handling of arc welding machine.* *8. Ensure appropriate use of PPE.*	**5. Perform metal surface build up**	
1. Define tack weld. 2. Explain tack welding and its importance. 3. List the types of the welding process. *4. Ensure proper handling of electrode and electrode holder.* *5. Ensure appropriate use of PPE.*	**6. Perform tack weld**	
1. Define weld joint. 2. State the different types of welding joints. 3. State the different types of welding positions. 4. State the purpose of the keyhole. 5. Describe butt joint. **6.** State the application of butt joint in all positions. *7. Ensure proper handling of electrode and electrode holder.* *8. Ensure appropriate use of PPE.*	**7. Weld butt joint in all positions**	
1. Describe lap joint. 2. Explain the application of lap joint in all positions. *3. Ensure proper handling of electrode and electrode holder.* 4. *Ensure appropriate use of PPE.*	**8. Weld lap joint in all positions**	

1. Explain different metal joining methods 2. Describe T-Joint **3.** Explain the types of weld. **4.** Describe the nomenclature of fillet weld **5.** Describe the nomenclature groove weld **6.** Describe the types of weld pass 7. Explain the application of T-joint in all positions. *8. Ensure proper handling of electrode and electrode holder.* *9. Ensure appropriate use of PPE.*	**9. Weld T-joint in all positions**	XI
1. Describe corner joint. **2.** State the purpose of root gap. **3.** Explain the application of corner joint in all positions. **4.** State the difference between back welding and backing weld *5. Ensure proper handling of electrode and electrode holder.* 6. *Ensure appropriate use of PPE.*	**10. Weld corner joint in all positions**	
1.1.1. Describe the flange joint. 1.1.2. Describe the mode of metal transfer 1.1.3. Explain the application of flange joint in all positions. *1.1.4. Ensure proper handling of electrode and electrode holder.* 1.1.5. *Ensure appropriate use of PPE.*	**11. Weld flange joint in all positions**	
1. Describe the pipe joint. 2. Explain the pipe welding positions (1G/2G/5G/6G). 3. State the advantages and disadvantages of pipe welding. 4. Explain the types of pipe joints *5. Ensure proper handling of electrode and electrode holder.*	**12. Perform pipe welding in all positions**	

6. Ensure appropriate use of PPE.		
3.6.1. Explain the importance of surface cleaning 3.6.2. Describe the technique of surface cleaning 3.6.3. State the types of penetrant test 3.6.4. Define liquid penetrant test 3.6.5. Describe the purpose of liquid penetrant test 3.6.6. Describe the set of liquid penetrant kits 3.6.7. Explain the principle of liquid penetrant test 3.6.8. Describe the types of indication 3.6.9. *Ensure to avoid DPT when job piece is in hot condition* 3.6.10. *Ensure appropriate use PPE*	**3.13 Perform liquid penetrant test**	
Chapter 1 Perform oxy-acetylene welding		XII
1.1.1. Introduce oxy-acetylene welding 1.1.2. Explain the working principle of oxy-acetylene welding 1.1.3. Explain the tools used in oxy-acetylene welding and their functions 1.1.4. Describe the features of oxygen and acetylene cylinder 1.1.5. State the Dos and Don'ts of gas cylinders handling 1.1.6. State the types of gas 1.1.7. Explain the types of welding position 1.1.8. Explain the welding techniques 1.1.9. Describe the importance of maintaining blowpipe angle 1.1.10. Explain the characteristics of hose 1.1.11. Describe the selection of nozzle 1.1.12. Perform flame setting for oxyacetylene welding	**1. Perform setup for oxy-acetylene welding**	

1.1.13. *Ensure appropriate use PPE.*		
1. State the types of base metal *2.* Describe types of flame and its characteristics *3.* Describe application of flames *4.* State the function of flash back arrestor (FBA) *5.* State the indication, causes and remedies of backfire and flashback *6.* Describe the importance of cracking gas cylinders *7.* Describe application of straight-line bead without filler rod *8.* State the types of regulator *9.* Describe function of regulator *10.* Explain working principle of regulator *11.* Describe the construction of blow pipe *12.* State the types of blowpipe and their functions *13.* Explain the importance of cleaning nozzle tip *14.* Explain marking tool and its purpose *15.* State the selection of parameters for oxyacetylene welding *16.* Operating a guillotine machine.	**2. Perform straight line bead without filler rod**	
5. Purpose of filler rod *6.* Feeding technique of filler rod *7.* Purpose of flux *8.* Types of clamping devices *9.* Distortion and its control *10.* Describe the application of straight-lined bead with filler rod *11. Ensure appropriate use of PPE.*	**3. Perform straight line bead with filler rod**	

1.2.1 Describe *1F* 1.2.2 Describe the application of welding fillet joint in flat position *1.2.3 Ensure appropriate use of PPE.*	**4. Perform welding fillet joint in flat position (1F)**	
1. Describe *1G* 2. Describe the application of welding butt joint in flat position *3. Ensure appropriate use of PPE.*	**5. Perform butt joint in flat position (1G)**	
1.6.1. Describe *1F* 1.6.2. Describe the application of welding fillet joint in horizontal position 1.6.3. Ensure appropriate use PPE	**6. Perform fillet joint in horizontal position (2F)**	
▪ Define 2G ▪ Describe the application of welding butt joint in horizontal position 1.1.3 Ensure appropriate use PPE	**7. Perform butt joint in horizontal position (2G)**	
1. Describe 3F *2.* Describe the application of welding fillet joint in vertical position *3.* State the difference between SMAW and oxy-acetylene welding *4.* State the advantages and limitations of Oxy-acetylene welding *5. Ensure appropriate use of PPE.*	**8. Perform fillet joint in vertical position (3F)**	
Chapter 2- Perform oxy-acetylene cutting		
1. Introduce oxy-acetylene cutting process *2.* Explain the working principle of oxy-acetylene cutting and its application *3.* Describe the construction of cutting blowpipe *4.* State the difference between oxy-acetylene cutting blow pipe and welding blow pipe	**1. Setup oxy-acetylene cutting equipment**	

5. Explain cutting tolerance and its importance *6.* State the types of cutting nozzle *7.* Describe selection of cutting nozzle *8.* Describe the importance of gas pressure setting *9.* State advantages and limitation of oxy-acetylene cutting process *10.* State the comparison between oxy-acetylene cutting and shielded metal arc cutting *11.* Perform flame setting for oxy-acetylene cutting *12. Ensure appropriate use of PPE.*		
1. Explain cutting techniques 2. Describe the application of straight cutting 3. State gas cutting defects and its remedies 4. Explain the importance of maintaining gap between tip of cone and work piece 5. *Ensure appropriate use of PPE.*	**2. Perform straight cutting**	
1. State method of piercing a hole 2. Describe the application of angle cutting *3. Ensure appropriate use of PPE.*	**3. Perform angle cutting**	
1. Describe the types of cutting in profile 2. Explain the importance of templates 3. State the methods of profile cutting *4. Ensure appropriate use PPE*	**4. Perform profile cutting**	
Chapter 3: Perform post work for oxy-acetylene processes		
3.5.1. Explain importance of visual inspection 3.5.2. Describe importance of proper lighting while welding 3.5.3. Using weld gauge 3.5.4. *Ensure appropriate use of PPE.*	**1. Perform visual inspection work piece**	

1. Explain importance of maintenance *2.* Explain preventive maintenance of oxy-acetylene equipment *3. Ensure appropriate use of PPE.*	**2. Maintain oxy-acetylene equipment**	
1. Describe estimation and costing 2. Estimate the weight of materials 3. Estimate the cost of product 4. Estimate the cost of oxyacetylene process 5. *Ensure appropriate use of PPE.*	**3.3 Perform basic estimation and costing**	

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Carry out basic engineering drawing
2. Handle the drawing instruments properly.
3. Layout the drawing sheet as per the required dimensions
4. Interpret the signs and symbols as required.
5. Draw different types of lines as per the applications.
6. Draw letters and numbers as per the given scale.
7. Provide dimensions as per the standard.

2) CLASS X COMPETENCIES

1. Convert the drawing scales as per the standard ratios.
2. Draw isometric blocks as per the given dimension in standard procedures.
3. Interpret any mechanical parts into the 3D drawing.
4. Draw orthographic projections as per the standard procedure and dimensions

3) CLASS XI COMPETENCIES

1. Draw isometric views, orthographic projections, and mechanical machine parts
2. Draw mechanical parts as per job requirements.
3. Develop the surface of any mechanical machine parts.

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills in table format

Learning objectives	Core concepts (Chapters/Topics)	Class
	MODULE: INTERPRETING ENGINEERING DRAWING	**IX**
	Chapter: 1 Draw basic signs, symbols and dimension	
1. Define engineering drawing. 2. State the purposes of engineering drawing. 3. List the types of drawing instruments. 4. State uses of drawing instruments. 5. List types and sizes of drawing papers. *6. Ensure clean and neatness of drawing.* *7. Ensure proper handling of drawing instruments.*	**1. Use drawing instruments**	
1. Define layout. *2.* List terminology used for layouts. *3.* Define title block. *4.* Explain the purpose of the title block. *5. Ensure clean and neatness of drawing.* *6. Ensure Proper handling of drawing instruments.*	*2.* **Layout drawing sheet**	
1. Define sign and symbol 2. Draw civil signs and symbols 3. Define abbreviation 4. List the abbreviation used in dimensioning 5. List the abbreviation used in drawing 6. List the abbreviation used for the units of length *7. Ensure clean and neatness of drawing* *8. Ensure Proper handling of drawing instruments*	*3.* **Interpret Engineering signs, symbols and abbreviations**	

1. Define line. 2. State types of line and its applications. *3. Ensure clean and neatness of drawing.* *4. Ensure Proper handling of drawing instruments.*	**4. Draw different types of lines**	
1. Define lettering and numbering. 2. Classify letters style. 3. List the types of letters. 4. Define freehand lettering. 5. List the size of letters. 6. State the rules for lettering and numbering. *7. Ensure clean and neatness of drawing.* *8. Ensure Proper handling of drawing instruments.*	**5. Draw letters and numbers**	
1. Define dimension. 2. State the types of dimensioning. 3. Explain the system of dimensioning. 4. State the terminologies of dimensions. *5. Ensure clean and neatness of drawing.* *6. Ensure Proper handling of drawing instruments.*	**6. Provide dimensions**	
Chapter: 2. Drawing isometric and mechanical parts		X
1. Define the scale of the drawing. 2. List types of scale. *3. Ensure clean and neatness of drawing.* 4. *Ensure Proper handling of drawing instruments.*	**1. Convert drawing scale**	
1. Define isometric drawing. 2. State isometric terminologies. *3. Ensure clean and neatness of drawing.* *4. Ensure Proper handling of drawing instruments.*	**2. Draw isometric blocks**	
1. Define mechanical drawing. 2. List types of mechanical drawing.	**3. Interpret simple mechanical drawing**	

3. Explain plan, elevation, and section. *4. Ensure clean and neatness of drawing.* *5. Ensure Proper handling of drawing instruments.*		
Chapter: 3 Interpreting Technical drawing		XI
1. Describe sectional views. 2. Describe auxiliary views. *3. Ensure clean and neatness of drawing.* *4. Ensure Proper handling of drawing instruments.*	**1. Draw isometric views for different joint**	
1. Define orthographic drawing. 2. List the four quadrants. 3. State types of orthographic projections. 4. Differentiate between first and third angle projection. *5. Ensure clean and neatness of drawing.* *6. Ensure Proper handling of drawing instruments.*	**2. Draw orthographic projection**	
1. Development of surfaces. *2. Ensure clean and neatness of drawing* *3. Ensure Proper handling of drawing instruments*	**3. Draw mechanical machine parts**	

ANNEXURE VI: LHADRI (SHING TSHOEN)

ཤིང་ཚོན་ ཚོས་ཚན་རྩ་གཞུང་གི་ནང་དོན་བཀོད་རིས།

Instructional hours

རྒྱབ་རིམ། Class	སྡེར་ཚན། Module	སྡེབ་ཚན Chapter	སྒོ་བ་ཚན Lessons	ཆུ་ཚོད་ཡོངས་བསྡོམ། Nominal Duration (Hrs)
IX	སྡེར་ཚན་དང་པ། ཤེང་ཚོན་གི་རི་མོ་འཕྲི་ནི།	སྡེབ་ཚན་དང་པ། ལྷ་གི་འཕྲོད་སྐྱེན་དང་ ཉེན་སྐྱོང་ལག་ལེན་འཐབ་ནི།	༡.༡ 5s གི་རྩ་དོན་ལག་ལན་འཐབ་ནི། ༡.༢ ལྷ་གི་འཕྲོད་སྐྱེན་དང་ཉེན་སྐྱོང་ལག་ལེན་འཐབ་ནི།(OHS) ༡.༣ བདག་གི་ཉེན་སྐྱོང་གི་མཁོ་ཆས་ལག་ལེན་འཐབ་ནི། (PPE)	4.5
		སྡེབ་ཚན་གཉིས་པ། ལེ་ཏོག་གི་རིགས་རི་མོ་འཕྲི་ནི།	༢.༡ སྨན་རྩེ་ལེ་ཏོག་གི་རི་མོ་འཕྲི་ནི། ༢.༢ གསལ་ཡང་/སེའུ་ལེ་ཏོག་གི་ རི་མོ་འཕྲི་ནི། ༢.༣ མཐོང་གསལ་ལེ་ཏོག་གི་ རི་མོ་འཕྲི་ནི། ༢.༤ ལྟགས་པད་ཀྱི་རི་མོ་འཕྲི་ནི། ༢.༥ པད་མགོ་ལྟ་མའི་རི་མོ་འཕྲི་ནི། ༢.༦ ལོ་འདབ་ཀྱི་རི་མོ་འཕྲི་ནི། ༢.༧ གུག་ལི་གི་རི་མོ་འཕྲི་ནི། ༢.༨ སྤུབ་ཆུང་གི་རི་མོ་འཕྲི་ནི། ༢.༩ པད་འདབ་ཀྱི་རི་མོ་འཕྲི་ནི།	55

			༢.༡༠ མེ་ཏོག་ཡོངས་རྫོགས་ཀྱི་དེ་མོ་བྱེ་ནི།	
		སྟོན་ཚན་གསུམ་པ། པ་ཏུའི་རིགས་ཀྱི་དེ་མོ་བྱེ་ནི།	༣.༡ པ་ཏ་གསུམ་པའི་དེ་མོ་བྱེ་ནི། ༣.༢ པ་ཏ་བདུན་ཚའི་དེ་མོ་བྱེ་ནི། ༣.༣ ཤིང་ལོ་པ་ཏུའི་དེ་མོ་བྱེ་ནི། ༣.༤ ནོར་འཛིན་པ་ཏུའི་དེ་མོ་བྱེ་ནི། ༣.༥ ཆིགས་ཆུན་པ་ཏུའི་དེ་མོ་བྱེ་ནི། ༣.༦ མེ་རི་པ་ཏ་གི་རི་མོ་བྱེ་ནི།	36
	སྦྱོང་ཚན་གཉིས་པ། ཤིང་ཆོག་གཏང་ནི།	**སྟོན་ཚན་དང་པ།** ཤིང་ཆོག་ལྟ་གི་དོན་ལུ་གྲ་སྒྲིགས་འབད་ནི།	༡.༡ ཚག་པར་བཟོ་ནི། ༡.༢ བརྡབ་ཕྱེ་བཟོ་ནི།	3
		སྟོན་ཚན་གཉིས་པ། ཤིང་ཆོག་ཀྱི་ཆོག་སྦྱོར་ནི།	༢.༡ ས་ཆོག་སྦྱོར་ནི།	3.5
		སྟོན་ཚན་གསུམ་པ། ཤིང་ཆོག་ཀྱི་ཏ་ཆོ་ན་/ཏས་ཆོག་གཏང་ནི།	༣.༡ སྨན་རྩེ་མེ་ཏོག་ཆོག་གཏང་ནི། ༣.༢ གསལལཔ་/སེའུ་མེ་ཏོག་ཆོག་གཏང་ནི། ༣.༣ མཐོང་གསལལ་མེ་ཏོག་ཆོག་གཏང་ནི། ༣.༤ པན་མེ་ཏོག་ཏང་ཆོག་གཏང་ནི།	30
				བསྟོམས། 132

སྡེབ་རིམ Class	སྡེར་ཚན། Module	སྟོན་ཚན། Chapter	སྡེབ་ཚན། Lessons	ཆུ་ཚོད་ཡོངས་སྟོམ། Nominal Duration (Hrs)
X	**སྡེར་ཚན་དང་པ།** ཤེང་ཚོན་གཅི་དེ་མ་འཐེ་ནི།	**སྟོན་ཚན་བཞི་པ།** གོས་དེས་རིས་གས་ཀྱི་དེ་མ་བྱེ་ནི།	༣.༡ སྤྱིན་རིས་ཀྱི་དེ་མ་བྱེ་ནི། ༣.༢ གཡུང་དྲུང་གི་ དེ་མ་བྱེ་ནི། ༣.༣ ཁ་ཚོམ་ཀྱི་དེ་མ་བྱེ་ནི། ༣.༤ སྤས་དེག་ཀྱི་དེ་མ་བྱེ་ནི ༣.༥ ཀུང་ཀ་རྒྱ་ཅནམ་དེ་མ་བྱེ་ནི། ༣.༦ ཀུང་ཀ་ཐད་རེལཾ་དེ་མ་བྱེ་ནི།	23
	སྟོན་ཚན་ལྔ་པ། མཆོད་རྟས་འདོད་ཡོན་ལྔའི་དེ་མ་བྱེ་ནི།	༤.༡ གཟུགས་ཀྱི་དེ་མ་མེ་ལོང་བྱེ་ནི། ༤.༢ སྒྲའི་དེ་མ་སྒྲ་སྐན་བྱེ་ནི། ༤.༣ དྲིའི་དེ་མ་དྲི་ཆབ་དུང་དཀར་ཀྱི་དེ་མ་བྱེ་ནི། ༤.༤ རོའི་དེ་མ་ཤིང་ཏོག་བིལ་བ་བྱེ་ནི། ༤.༥ རེག་བྱའི་དེ་མ་དར་དསྐང་བྱེ་ནི།	42.5
	སྡེར་ཚན་གཉིས་པ། ཤེང་ཚོན་གཅོད་ནི།	**སྟོན་ཚན་གཉིས་པ།** ཤེང་ཚོན་ཀྱི་ཚོན་སྡེར་ནི།	༢.༡ བཟང་ཚོན་སྡེར་ནི།	3.5
		སྟོན་ཚན་གསུམ་པ།	༣.༡ དར་དསྐང་ཏང་ཚོན་/ཏས་ཚོན་གཏང་ནི།	6.5

		ཤིང་ཚོན་གྱི་ཉང་ཚོན་/ཉས་ཚོན་གཏང་ཚུགས།		
		སྟོན་ཚན་བཞི་པ། ཤིང་ཚོན་གསུམ་མདངས་གཏང་ནི།	୧.୨ པབྷ་མགོ་ལྟ་མ་གསུམ་གདང་གཏང་ནི། ୧.୩ ནོར་འཛིན་པ་ཏ་གསུམ་གདང་གཏང་ནི། ୧.୪ ཤིང་ལོ་ པ་ཏ་གསུམ་གདང་གཏང་ནི། ୧.୧ ཚིགས་ཆུན་པ་ཏ་གསུམ་གདང་གཏང་ནི།	22.5
		སྟོན་ཚན་ལྔ་པ། ཤིང་ཚོན་བྱོན་མདངས་གཏང་ནི།	୫.୨ འདོད་ཡོན་ལྔ་བྱོན་མདངས་གཏང་ནི།	34
			བསྡོམས།	**132**

སྡེབ་རིམ Class	**སྡེར་ཚན།** Module	**སྟོན་ཚན།** Chapter	**སྡེབ་ཚན།** Lessons	**ཆུ་ཚོད་ཡོངས་སྟོམ།** Nominal Duration (Hrs)
XI	**སྡེར་ཚན་དང་པ།** ཤིང་ཚོན་གི་རི་མོ་འཁྱེ་ནི།	**སྟོན་ཚན་དྲུག་པ།** མཚོད་ཕྱས་ནོར་བུ་ཆ་བདུན་གྱི་རི་མོ་ཁྱེ་ནི།	୧.୨ བས་རྒུ་རྣའི་རི་མོ་ཁྱེ་ནི། ୧.୩ གླང་ཆེན་མཆེ་བའི་རི་མོ་ཁྱེ་ནི། ୧.୩ ཐུ་རུ་ཤིང་གི་རི་མོ་ཁྱེ་ནི། ୧.୧ སེང་གེ་སྣའི་རི་མོ་ཁྱེ་ནི། ୧.୫ གསེར་གྱི་གླིགས་ཤིང་གི་རི་མོ་ཁྱེ་ནི། ୧.୬ རྒྱལ་པོའི་སྣན་རྒྱན་གྱི་རི་མོ་ཁྱེ་ནི། ୧.୭ བཙུན་མོའི་སྣན་རྒྱན་གྱི་རི་མོ་ཁྱེ་ནི།	108

	སྒོར་ཚན་གཉིས་པ། ཤིང་ཚོན་གཏང་ནི།	སྟོན་ཚན་དང་པ། ཤིང་ཚོན་ལྟ་གི་དོན་ལུ་ གྲ་སྒྲིག་འབད་ནི།	༡.༡ ལྟ་ཁྲི་བཟོ་ནི།	
			༡.༢ བས་གཞི་བཅའ་སྒྲིག་རྒྱབ་ནི།	
			༡.༣ ཕྱིར་བཟོ་ནི།	30
			༡.༤ སྐྱོ་འབྱངས་བཟོ་ནི།	
		སྟོན་ཚན་གཉིས་པ། ཤིང་ཚོན་གྱི་ཚོན་སྒྱོར་ནི།	༢.༡ གྱིབ་ཚོན་སྒྱོར་ནི།	7.5
		སྟོན་ཚན་གསུམ་པ། ཤིང་ཚོན་རྩོན་མདངས་ གཏང་ནི།	༣.༡ ནོར་བུ་ཆ་བདུན་རྩོན་མདངས་གཏང་ནི།	46.5
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ཐྲོག་རིམ Class	སྒྱོང་ཚན། Module	སྟོན་ཚན། Chapter	སྦྱོབ་ཚན། Lessons	ཆུ་ཚོད་ཡོངས་སྟོམ། Nominal Duration (Hrs)
XII	སྒྱོང་ཚན་དང་པ། ཤིང་ཚོན་གྱི་"རི་མོ་འཕྲི་ནི།	སྟོན་ཚན་བརྒྱད་པ། གཟུགས་བརྙན་འདབ་ཚགས་རིགས་ཀྱི་རི་མོ་བྱེ་ནི།	༨.༡ འདབ་ཚགས་ཁྲུང་ཁྲུང་གི་རི་མོ་བྱེ་ནི།	55.5
			༨.༢ འདབ་ཚགས་རྩ་བྱའི་རི་མོ་བྱེ་ནི།	
			༨.༣ འདབ་ཚགས་བྱ་ཚེ་རིང་གི་རི་མོ་བྱེ་ནི།	
		སྟོན་ཚན་དགུ་པ། དམིགས་བསལ་མཚོན་བྱེད་ གཟུགས་བརྙན་རིགས་ཀྱི་རི་མོ་བྱེ་ནི།	༩.༡ ཙོ་པ་ཏྲ/ཅི་མ་འདྲའི་རི་མོ་བྱེ་ནི།	81.5
			༩.༢ རི་དྭགས་ཆོས་འཁོར་གྱི་རི་མོ་བྱེ་ནི།	
			༩.༣ ངང་མཆོ་རལ་གྲིའི་ ⸢སྟོམ་བཙོན་དམ་པ⸣ རི་མོ་བྱེ་ནི།	

	སྒྲོང་ཚན་གཉིས་པ། ཤིང་ཚོན་གཏང་ནི།	སྟོན་ཚན་བཞི་པ། ཤིང་ཚོན་གསུམ་མདངས་གཏང་ནི།	༤.༡ བྱ་ཚེ་རིང་གསུམ་མདངས་གཏང་ནི། ༤.༢ ཅོ་པ་ཏ/ཅེ་མ་འཇུ་གསུམ་ མདངས་གཏང་ནི།	55
			བསྟོམས།	**192**
			ཡོངས་བསྟོམས།	༦༩༢

Class- wise Competencies

ཀ། སྒོབ་རིམ་རེ་རེ་བཞིན་གྱི་རིག་རྩལ་སྒོམ་གསུབ།

དང་པ། སྒོབ་རིམ་ ཚ་ པའི་རིག་རྩལ་སྒོམ་གསུབ། (Competencies)

1. 5S འདི་ནམ་ར་འབད་རུང་ ལྟ་གཅེ་འབད་རུང་ རེས་གཏན་ལག་ལེན་འཐབ་ཚུགས།
2. ལྟ་གི་འཕྲོད་སྟེན་དང་ཉེན་སྐྱང་གི་ བྱ་སྤྱིའི་རིམ་པ་ ལག་ལེན་འཐབ་ཚུགས།
3. ཉེན་སྐྱང་གི་མཐོ་ཆས་ཚུ་ དགོས་མཐོ་དང་འཁྲིལ་ ལག་ལེན་འཐབ་ཚུགས།
4. ལྟ་དང་ཁྲིལ་ཏེ་ ཉེན་སྐྱང་གི་མཐོ་ཆས་ ལག་ལེན་འཐབ་ཚུགས།
5. སྐན་རྩེ་མེ་ཏོག་ རྒྱས་སྐྱེད་ཀྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
6. ལྷགས་པད་རྒྱང་ཤབ་དང་ གཉིས་རྩེག་གི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
7. པདྨ་མཚོ་ལྷ་མ་དང་གཉིས་རྩེག་གི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
8. ལོ་འདབ་ཀྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ལག་ལེན་འཐབ་ཚུགས།
9. གུག་ལི་/ལོ་གུག་ རྒྱས་སྐྱེད་ཀྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
10. སྤུབ་ཆུང་ རྒྱས་སྐྱེད་འཕེད་གསུམ་གྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
11. སྤུབ་ཆུང་ རྒྱས་སྐྱེད་འཕེད་གསུམ་གྱི་རི་མོ་འདི་ལས་ རྟགས་བཀོད་རིས་འབད་ ལག་ལེན་འཐབ་ཚུགས།
12. པད་འདབ་ཀྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
13. མེ་ཏོག་ཡོངས་རྫོགས་ཀྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
14. པ་ཏྲ་མཐོ་གསུམ་མ་གྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
15. པ་ཏྲ་བདུན་མ་ཀྱི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
16. ཤིང་ལོ་པ་ཏྲའི་རི་མོ་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
17. ཤིང་ལོ་པ་ཏྲའི་རི་མོ་འདི་ དབེ་གསར་ཁྲ་བཀོད་འབད་ ལག་ལེན་འཐབ་ཚུགས།
18. ས་ཚོན་སྒྲོང་ནི་འདི་ ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།

๓๙. སྨན་རྩེ་མེ་ཏོག་ཚོན་གཏང་ནི་འདི་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๔๐. གསལཕ་མེ་ཏོག་ཚོན་གཏང་ནི་འདི་ ཤིང་ཚོན་བཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๔๑. མཐོང་གསལ་མེ་ཏོག་ཚོན་གཏང་ནི་འདི་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๔๒. པད་མ་མེ་ཏོག་ཁང་ཚོན་གཏང་ནི་འདི་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๔๓. ནོར་འཛིན་པ་ཏ་གི་རི་མོ་ ཤིང་ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๔๔. ཆོགས་ཆུན་པ་ཏ་གི་རི་མོ་ ཤིང་ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

གཉིས་པ། སློབ་རིམ་๶๐ པའི་རིག་རྩལ་སྟོགས་སྒྲུབ། (Competencies)

๑. སྤྱིན་རིས་འདི་ ཤིང་ཚོན་དང་ལྡེབས་རིས་ལ་སོགས་པ་ གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๒. སྤྱིན་རིས་འདི་ དེང་སང་གི་ཁ་བཀོད་འབད་ ལག་ལེན་འཐབ་ཆོག།

๓. ཁ་ཚོམ་གྱི་རི་མོ་ ཤིང་ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๔. གཡུང་དྲུང་ རྒྱས་སྡུད་འབྲིང་གསུམ་གྱི་རི་མོ་ ཤིང་ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๕. གཡུང་དྲུང་ རྒྱས་སྡུད་འབྲིང་གསུམ་གྱི་རི་མོ་ དེང་སང་གི་ཁ་བཀོད་འབད་ ལག་ལེན་འཐབ་ཆོག།

๖. འདོད་ཡོན་ལྔའི་རི་མོ་ ཤིང་ཚོན་དང་ལྡེབས་རིས་ཆུ་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๗. བཟང་ཚོན་སྒྲོན་ནི་འདི་ ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๘. དར་དཔྱང་ཁང་ཚོན་གཏང་ནི་འདི་ ཤིང་ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๙. ནོར་འཛིན་པ་ཏ་གསུམ་ མདངས་གཏང་ནི་འདི་ ཤིང་ཚོན་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๑๐. ཆོགས་ཆུན་པ་ཏ་ གསུམ་མདངས་གཏང་ནི་འདི་ ཤིང་ཚོན་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๑๑. པདྨ་མཁོ་ལྷ་མ་དང་གཉིས་རྟེགས་ཆུ་ གསུམ་མདངས་གཏང་ནི་འདི་ ཤིང་ཚོན་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๑๒. ཤིང་ལོ་པ་ཏ་གསུམ་མདངས་གཏང་ནི་འདི་ ཤིང་ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๑๓. འདོད་ཡོན་ལྔ་རྟོན་མདངས་གཏང་ནི་འདི་ ཤིང་ཚོན་དང་ལྡེབས་ལ་སོགས་པ་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๑๔ འདོད་ཡོན་ལྔ་རྟོན་མདངས་འདི་ ཁང་མིག་ལ་སོགས་པའི་མཛེས་བཀོད་ཀྱི་དོན་ལུ་ གཏང་ཆོགས།

གསུམ་པ། སློབ་རིམ་๶๑ པའི་རིག་རྩལ་སྟོགས་སྒྲུབ། (Competencies)

๑. ཆོས་ཇས་ནོར་བུ་ཆ་བདུན་གྱི་རི་མོ་ ཤིང་ཚོན་དང་ལྡེབས་རིས་ལ་སོགས་པ་ གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๒. ཚོན་གཏང་ནི་གི་དོན་ལུ་ ལྟ་ཁྲི་བཟོ་སྟེ་ ལག་ལེན་འཐབ་ཆོག།

๓. ཚོན་གཏང་ནི་གི་དོན་ལུ་ ཚ་བར་བཟོ་སྟེ་ ལག་ལེན་འཐབ་ཆོག།

๔. དེང་སང་བཀབ་ཤོག་ལག་ལེན་འཐབ་སྟེ་ ཚ་བར་བཟོ་ཆོག།

๕. རབ་ཕྱེ་བཟོ་ནི་འདི་ ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

๖. རས་གཞི་བཅའ་སྒྲིག་ཆུབ་ནི་འདི་ 'ཚོན་གཏང་པའི་སྐབས་ ལག་ལེན་འཐབ་ཆོག།

- ༧. སྤྱིར་བཙོ་ནི་འདི་ ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
- ༨. གྲིབ་ཚོན་སྤྱོར་ནི་འདི་ ཚོན་གཏང་བའི་སྐབས་ ལག་ལེན་འཐབ་ཚུགས།
- ༩. དེང་སང་ཅ་ཆས་ལག་ལེན་འཐབ་ཐོག་ལས་གྲིབ་ཚོན་སྤྱོར་ཚུགས།
- ༡༠. ཞོར་བུ་ཆ་བདུན་རྩོལ་མདངས་ ཤིང་ཚོན་ལ་སོགས་པ་གཏང་བའི་སྐབས་ལུ་ ལག་ལེན་འཐབ་ཚུགས།
- ༡༡. ཞོར་བུ་ཆ་བདུན་རྩོལ་མདངས་འདི་ ཁང་མིག་ལ་སོགས་པའི་མཇོས་བཀོད་ཀྱི་དོན་ལུ་ གཏང་ཚུགས།

བཞི་པ། སློབ་རིམ་༡༢ པའི་རིག་རྩལ་སྟོགས་གྲུབ། (competencies)

- ༡. གཟུགས་བརྙན་འདུབ་ཆགས་ རིགས་ཀྱི་རི་མོ་ ཤིང་ཚོན་དང་ལྡེབས་རིས་ལ་སོགས་པ་ གཏང་བའི་སྐབས་ལུ་ལག་ལེན་འཐབ་ཚུགས།
- ༢. གཟུགས་བརྙན་འདུབ་ཆགས་ རིགས་ཀྱི་རི་མོ་འདི་ དེང་སང་བཀོད་རིས་ཐོག་ལུ་བཟོ་ཚུགས།
- ༣. དཔེགས་བསལ་མཚོན་བྱེད་གཟུགས་བརྙན་རིགས་ཀྱི་རི་མོ་ ཤིང་ཚོན་དང་ལྡེབས་རིས་ལ་སོགས་པ་ བགཏང་བའི་སྐབས་ལུ་ལག་ལེན་འཐབ་ཚུགས།
- ༤. བྱ་ཚེ་རིང་གསུམ་མདངས་གཏང་ནི་འདི་ ཤིང་ཚོན་སྐབས་ལུ་ ལག་ལེན་འཐབ་ཚུགས།
- ༥. བྱ་ཚེ་རིང་གསུམ་མདངས་འདི་ ཁང་མིག་མཇོས་བཀོད་འབད་ བཟོ་ཚུགས།
- ༦. ཅོ་པ་ཏ་ གསུམ་མདངས་གཏང་ནི་འདི་ ཤིང་ཚོན་སྐབས་ལུ་ ལག་ལེན་འཐབ་ཚུགས།
- ༧. ཅོ་པ་ཏ་ གསུམ་མདངས་འདི་ ཁང་མིག་མཇོས་བཀོད་འབད་ བཟོ་ཚུགས།

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	Core concepts (Chapters/Topics)	Class
	སྤྱོང་ཚན་དང་པ། ཤིང་ཚོན་གྱི་རི་མོ་བྱེ་ནི། **སྟོན་ཚན་དང་པ་** ལྟ་གི་འཕྲོད་བསྟེན་དང་ཉེན་སྤུང་ལ་ལག་ལེན་འཐབ་ནི།	IX
༡.༡.༡ 5S གི་རྩ་དོན་ལག་ལན་འཐབ་ཚུགས། ༡.༡.༢ 5S གི་དགོས་པ་བཤད་ཚུགས། ༡.༡.༣ 5S གི་རྩ་དོན་སྐོར་ལས་བཤད་པ་རྒྱབ་ཚུགས། ༡.༡.༤ 5S སྤྱོ་བ་དང་གཅིག་སྤྱིལ་ཐོག་ལས་ལག་ལེན་འཐབ་ཚུགས།	༡.༡ 5S གི་རྩ་དོན་ལག་ལན་འཐབ་ནི།	

๗.๙.๑ ལྟ་གི་འཕྲོད་སྟེན་དང་ ཉེན་སྐྱོང་གི་དགོས་པ་ བཤད་ཚུགས། ๗.๙.๒ ལྟ་གི་འཕྲོད་སྟེན་དང་ ཉེན་སྐྱོང་གི་གལ་ཅན་ཚུ་ བཤད་ཚུགས། ๗.๙.๓ ལྟ་གི་འཕྲོད་སྟེན་དང་ ཉེན་སྐྱོང་གི་གཞི་རྟེན་འཐོབ་དབང་སྐོར་ བཤད་ཚུགས། ๗.๙.๔ ལྟ་གི་འཕྲོད་སྟེན་དང་ ཉེན་སྐྱོང་གི་གལ་ཅན་ཚུ་ཧོ་ཧོ་ བཤད་ཚུགས། ๗.๙.๕ ལྟ་གི་འཕྲོད་སྟེན་དང་ ཉེན་སྐྱོང་ལག་ལེན་ འཐབ་ཚུགས།	๗.๙ ལྟ་གི་འཕྲོད་བསྟེན་དང་ ཉེན་སྐྱོང་ལག་ལེན་འཐབ་ནི། (OHS)	
๗.๓.๑ དང་གི་ཉེན་སྐྱོང་གི་མཁོ་ཆས་སྐོར་ལས་འགྲེལ་བཤད་ཆུབ་ཚུགས། ๗.๓.๒ དང་གི་ཉེན་སྐྱོང་གི་མཁོ་ཆས་ཁག་ཆེཤ་ཕེནམ་བཤད་ཚུགས། ๗.๓.๓ དང་གི་ཉེན་སྐྱོང་གི་མཁོ་ཆས་ངོས་འཛིན་འབད་ཚུགས། ๗.๓.๔ གནས་སྐྱངས་དང་འཁྲིལ་བང་གི་ཉེན་སྐྱོང་ གི་མཁོ་ཆས་ལག་ལེན་འཐབ་དགོ།	๗.๓ དང་གི་ཉེན་སྐྱོང་གི་མཁོ་ཆས་ ལག་ལེན་འཐབ་ནི། (PPE)	
སྟོན་ཚན་གཉིས་པ། མེ་ཏོག་རིགས་ཀྱི་དེ་མོ་འབྲི་ནི།		
๙.๑.๑ སྨན་རྩེ་མེ་ཏོག་གི་ གོ་དོན་བཤད་ཚུགས། ๙.๑.๒ སྨན་རྩེ་མེ་ཏོག་གི་ འགྲེལ་པ་ཆུབ་ཚུགས། ๙.๑.๓ སྨན་རྩེ་མེ་ཏོག་གི་ འཐཕོབ་ལམ་བཤད་ཚུགས། ๙.๑.๔ སྨན་རྩེ་མེ་ཏོག་གི་ དབྱེ་བ་ཕྱེ་ཚུགས། ๙.๑.๕ སྨན་རྩེ་མེ་ཏོག་གི་ རི་མོ་བྱི་ཚུགས། ๙.๑.๖ སྤྲོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	๙.๑ སྨན་རྩེ་མེ་ཏོག་གི་རི་མོ་འབྲི་ནི།	
๙.๒.๑ གསལ་ཁ་མེ་ཏོག་གི་ གོ་དོན་བཤད་ཚུགས། ๙.๒.๒ གསལ་ཁ་མེ་ཏོག་གི་ འགྲེལ་པ་ཆུབ་ཚུགས། ๙.๒.๓ གསལ་ཁ་མེ་ཏོག་གི་ འཐོབ་ལམ་བཤད་ཚུགས།	๙.๒ གསལ་ཁ་མེ་ཏོག་གི་རི་མོ་ འབྲི་ནི།	

༡.༡.༩ གསལ་ཁ་མེ་ཏོག་གི་ དབྱེ་བ་ཕྱེ་ཚུགས། ༡.༡.༥ གསལ་ཁ་མེ་ཏོག་གི་ རི་མོ་བྲི་ཚུགས། ༡.༡.༦ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།		
༡.༢.༧ མཐོང་གསལ་ཏོག་གི་ གོ་དོན་བཤད་ཚུགས། ༡.༢.༨ མཐོང་གསལ་མེ་ཏོག་གི་ འགྲེལ་པ་རྒྱབ་ཚུགས། ༡.༢.༣ མཐོང་གསལ་མེ་ཏོག་གི་ འཐོབ་ལམ་བཤད་ཚུགས། ༡.༢.༩ མཐོང་གསལ་མེ་ཏོག་གི་ རི་མོ་བྲི་ཚུགས། ༡.༢.༥ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	༡.༢ མཐོང་གསལ་མེ་ཏོག་གི་རི་མོ་འབྲི་ནི།	
༡.༩.༧ ལྟགས་པད་ཀྱི་ གོ་དོན་བཤད་ཚུགས། ༡.༩.༨ ལྟགས་པད་ཀྱི་ འགྲེལ་པ་རྒྱབ་ཚུགས། ༡.༩.༣ ལྟགས་པད་ཀྱི་ འཐོབ་ལམ་བཤད་ཚུགས། ༡.༩.༩ ལྟགས་པད་ཀྱི་ དབྱེ་བ་ཕྱེ་ཚུགས། ༡.༩.༥ ལྟགས་པད་ཀྱི་ རི་མོ་བྲི་ཚུགས། ༡.༩.༦ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	༡.༩ ལྟགས་པད་ཀྱི་རི་མོ་འབྲི་ནི།	
༡.༥.༧ པདྨ་མཚོ་ལྟ་མ་གི་ གོ་དོན་བཤད་ཚུགས། ༡.༥.༨ པདྨ་མཚོ་ལྟ་མ་གི་ འགྲེལ་པ་རྒྱབ་ཚུགས། ༡.༥.༣ པདྨ་མཚོ་ལྟ་མ་གི་ འཐོབ་ལམ་བཤད་ཚུགས། ༡.༥.༩ པདྨ་མཚོ་ལྟ་མ་གི་ དབྱེ་བ་ཕྱེ་ཚུགས། ༡.༥.༥ པདྨ་མཚོ་ལྟ་མ་གི་ རི་མོ་བྲི་ཚུགས། ༡.༥.༦ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	༡.༥ པདྨ་མཚོ་ལྟ་མ་གི་རི་མོ་འབྲི་ནི།	
༡.༦.༧ ལོ་འདབ་ཀྱི་ གོ་དོན་བཤད་ཚུགས།	༡.༦ ལོ་འདབ་ཀྱི་རི་མོ་འབྲི་ནི།	

༣.༨.༢ ལ་འདུ་ཀྱི་ འཐོབ་ལམ་བཤད་ཚུགས།		
༣.༨.༣ ལོ་འདུ་ཀྱི་ དབྱེ་བ་ཕྱེ་ཚུགས།		
༣.༨.༤ ལོ་འདུ་ཀྱི་ རི་མོ་བྱི་ཚུགས།		
༣.༨.༥ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་" ལྟ་འབད་ཚུགས།		
༣.༩.༡ གུག་ལི་གི་གོ་ དོན་བཤད་ཚུགས།	༣.༩ གུག་ལི་གི་རི་མོ་འབྱི་ནི།	
༣.༩.༢ གུག་ལི་གི་ འགྲེལ་པ་རྒྱབ་ཚུགས།		
༣.༩.༣ གུག་ལི་གི་ འཐོབ་ལམ་བཤད་ཚུགས།		
༣.༩.༤ གུག་ལི་གི་ དབྱེ་བ་ཕྱེ་ཚུགས།		
༣.༩.༥ གུག་ལི་གི་ རི་མོ་བྱི་ཚུགས།		
༣.༩.༦ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་"ལྟ་འབད་ཚུགས།		
༣.༡.༡ སྒྲུབ་ཆུང་གི་ གོ་དོན་བཤད་ཚུགས།	༣.༡ སྒྲུབ་ཆུང་གི་རི་མོ་འབྱི་ནི།	
༣.༡.༢ སྒྲུབ་ཆུང་གི་ འགྲེལ་པ་རྒྱབ་ཚུགས།		
༣.༡.༣ སྒྲུབ་ཆུང་གི་ འཐོབ་ལམ་བཤད་ཚུགས།		
༣.༡.༤ སྒྲུབ་ཆུང་གི་ དབྱེ་བ་ཕྱེ་ཚུགས།		
༣.༡.༥ སྒྲུབ་ཆུང་གི་ རི་མོ་བྱི་ཚུགས།		
༣.༡.༦ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།		
༣.༥.༡ པད་འདུ་ཀྱི་ གོ་དོན་བཤད་ཚུགས།	༣.༥ པད་འདུ་ཀྱི་རི་མོ་བྱི་ནི།	
༣.༥.༢ པད་འདུ་ཀྱི་ འགྲེལ་པ་རྒྱབ་ཚུགས།		
༣.༥.༣ པད་འདུ་ཀྱི་ འཐོབ་ལམ་བཤད་ཚུགས།		
༣.༥.༤ པད་འདུ་ཀྱི་ དབྱེ་བ་ཕྱེ་ཚུགས།		
༣.༥.༥ པད་འདུ་ཀྱི་ རི་མོ་བྱི་ཚུགས།		

༣.୮.୬ སྒོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།		
༣.୨୦.୨ མེ་ཏོག་ཡོངས་རྫོགས་ཀྱི་ གོ་དོན་བཤད་ཚུགས། ༣.୨୦.୩ མེ་ཏོག་ཡོངས་རྫོགས་ཀྱི་ འགྲེལ་པ་རྩྭ་ཚུགས། ୩୨୦୩ མེ་ཏོགཡོངས་རྫོགས་ཀྱི་ འཐོབ་ལམ་བཤད་ཚུགས། ༣.୨୦.୧ མེ་ཏོག་ཡོངས་རྫོགས་ཀྱི་ དཔྱེ་བ་མྱེ་ཚུགས། ༣.୨୦.୫ མེ་ཏོག་ཡོངས་རྫོགས་ཀྱི་ རི་མོ་བྲི་ཚུགས། ༣.୨୦.୬ སྒོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.୨୦ མེ་ཏོག་ཡོངས་རྫོགས་ཀྱི་རི་མོ་བྲི་ནི།	
སྟོན་ཚན་གསུམ་པ། པ་ཏ་གི་རི་མོ་འབྲི་ནི།		
༣.୨.୨ པ་ཏ་གསུམ་པ་ཀྱི་ གོ་དོན་བཤད་ཚུགས། ༣.୨.୨ པ་ཏ་གསུམ་པ་ཀྱི་ འགྲེལ་པ་རྩྭ་ཚུགས། ༣.୨.୩ པ་ཏ་གསུམ་པ་ཀྱི་ འཐོབ་ལམ་བཤད་ཚུགས། ༣.୨.୧ པ་ཏ་གསུམ་པ་ཀྱི་རི་མོ་བྲི་ཚུགས། ୩୨.୫ སྒོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.୨ པ་ཏ་གསུམ་པའི་རི་མོ་བྲི་ནི།	
༣.୩.୨ པ་ཏ་བདུན་པ་ཀྱི་ གོ་དོན་བཤད་ཚུགས། ༣.୩.୨ པ་ཏ་བདུན་པ་ཀྱི་ འགྲེལ་པ་རྩྭ་ཚུགས། ༣.୩.୩ པ་ཏ་བདུན་པཀྱི་ འཐོབ་ལམ་བཤད་ཚུགས། ༣.୩.୧ པ་ཏ་བདུན་པ་ཀྱི་ རི་མོ་བྲི་ཚུགས། ༣.୩.୫ སྒོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.୩ པ་ཏ་བདུན་མའི་འབྲི་ནི།	
༣.୩.୨ ཤིང་ལོ་པ་ཏ་ཀྱི་གོ་དོན་བཤད་ཚུགས། ༣.୩.୨ ཤིང་ལོ་པ་ཏ་ཀྱི་འགྲེལ་བཤད་རྩྭ་ཚུགས། ༣.୩.୩ ཤིང་ལོ་པ་ཏ་ཀྱི་འཐོབ་ལམ་བཤད་ཚུགས།	༣.୩ ཤིང་ལོ་པ་ཏ་འབྲི་ནི།	

३.३.९ ཤིང་ལོ་ཁ་ཏ་ཀྱི་རི་མོ་བྱི་ཚུགས།		
३.३.५ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ཐོག་ལས་ལྟ་འབད་ཚུགས།		
३.९.१ ནོར་འཛིན་ཁ་ཏ་གི་ གོ་དོན་བཤད་ཚུགས།	३.९ ནོར་འཛིན་ཁ་ཏ་འབྱི་ནི།	
३.९.२ ནོར་འཛིན་ཁ་ཏ་གི་ འགྲེལ་ཁ་རྒྱབ་ཚུགས།		
३.९.३ ནོར་འཛིན་ཁ་ཏ་གི་ འཐོབ་ལམ་ཕྱེ་ཚུགས།		
३.९.९ ནོར་འཛིན་ཁ་ཏ་གི་ རི་མོ་བྱི་ཚུགས།		
३.९.५ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།		
३.५.१ ཚོགས་རྒྱན་ཁ་ཏ་གི་ གོ་དོན་བཤད་ཚུགས།	३.५ ཚོགས་རྒྱན་ཁ་ཏ་གི་རི་མོ་བྱིས་ནི།	
३.५.२ ཚོགས་རྒྱན་ཁ་ཏ་གི་ འགྲེལ་ཁ་རྒྱབ་ཚུགས།		
३.५.३ ཚོགས་རྒྱན་ཁ་ཏ་གི་ འཐོབ་ལམ་བཤད་ཚུགས།		
३.५.९ ཚོགས་རྒྱན་ཁ་ཏ་གི་ རི་མོ་བྱི་ཚུགས།		
३.५.५ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།		
३.७.१ མེ་རི་ཁ་ཏ་གི་ གོ་དོན་བཤད་ཚུགས།	३.७ མེ་རི་ཁ་ཏ་གི་རི་མོ་བྱིས་ནི།	
३.७.२ མེ་རི་ཁ་ཏ་གི་ འགྲེལ་ཁ་རྒྱབ་ཚུགས།		
३.७.३ མེ་རི་ཁ་ཏ་གི་ འཐོབ་ལམ་བཤད་ཚུགས།		
३.७.९ མེ་རི་ཁ་ཏ་གི་ རི་མོ་བྱི་ཚུགས།		
३.७.५ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།		
སྦྱོང་ཚན་གཉིས་པ། ཤིང་ཚོན་གཏང་ནི།		
སྟོན་ཚན་དང་པ་ ཤིང་ཚོན་ལྟ་གི་དོན་ལུ་གྲ་སྒྲིགས་འབད་ནི།		
४.१.१ ཚག་པར་གི་གོ་དོན་བཤད་ཚུགས།	४.१ ཚག་པར་བཟོ་ནི།	
४.१.२ ཚག་པར་གི་འགྲེལ་བཤད་པ་ཚུགས།		

༡.༡.༣ ཚགས་པར་གི་དཔེ་བ་བཤད་ཚུགས། ༡.༡.༤ ཚགས་པར་གི་འཛོབ་ལམ་ཕྱེ་ཚུགས། ༡.༡.༥ ཚགས་པར་བཟོ་ཚུགས། ༡.༡.༦ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ཐོག་ལས་ལྟ་འབད་ཚུགས།		
༡.༢.༡ བརྙན་གི་ཞོ་དོན་བཤད་ཚུགས། ༡.༢.༢ བརྙནར་གི་འགྲེལ་བཤད་པ་ཚུགས། ༡.༢.༣ བརྙན་གི་དཔེ་བ་ཕྱེ་ཚུགས། ༡.༢.༤ བརྙན་གི་འཛོབ་ལམ་བཤད་ཚུགས། ༡.༢.༥ ཚགས་པར་བཟོ་ཚུགས། ༡.༢.༦ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ཐོག་ལས་ལྟ་འབད་ཚུགས།	༡.༢ བརྙན་ཕྱེ་བཟོ་ནི།	
སྟོན་ཚན་གཉིས་པ། ཤིང་གྱིཆོན་སྦྱོར་ནི།		
༢.༡.༡ ས་ཆོན་གྱི་ ཞོ་དོན་བཤད་ཚུགས། ༢.༡.༢ ས་ཆོན་གྱི་ འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༢.༡.༣ ས་ཆོན་གྱི་ དཔེ་བ་བཤད་ཚུགས། ༢.༡.༤ ས་ཆོན་གྱི་ འཛོབ་ལམ་བཤད་ཚུགས། ༢.༡.༥ ས་ཆོན་གྱི་ དཞོས་པ་བཤད་ཚུགས། ༢.༡.༦ ས་ཆོན་ སྦྱོར་ཚུགས། ༢.༡.༧ སྤྱོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས། ༢.༡.༨ ཉེན་སྐྱོང་དང་ལྡན་ཨབད་ བཟོ་ཚུགས།	༢.༡ ས་ཆོན་སྦྱོར་ནི།	
སྟོན་ཚན་གསུམ་པ། ཤིང་ཆོན་གྱི་རྟང་/རྟས་ཆོན་གཏང་ནི།		

३.१.१ སྨན་རྩེ་མེ་ཏོག་གི་ གོ་དོན་བཤད་ཚུགས། ३.१.२ སྨན་རྩེ་མེ་ཏོག་གི་ འགྲེལ་བ་རྒྱབ་ཚུགས། ३.१.३ སྨན་རྩེ་མེ་ཏོག་གི་ དཔེ་བ་བཤད་ཚུགས། ३.१.४ སྨན་རྩེ་མེ་ཏོག་གི་ འཐོབ་ལམ་ཕྱེ་ཚུགས། ३.१.५ སྨན་རྩེ་མེ་ཏོག་ ཚོན་གཏང་ཚུགས། ३.१.६ སྤྲོ་བ་དང་གཅིག་སྦྲེལ་ལས་ ལྟ་འབད་ཚུགས། ३.१.७ ཉེན་སྐྱང་དང་ལྡན་མ་འབད་ གཏང་ཚུགས།	३.१ སྨན་རྩེ་མེ་ཏོག་ཚོན་ གཏང་ནི།	
३.२.१ གསལ་ཁ་མེ་ཏོག་གི་ གོ་དོན་བཤད་ཚུགས། ३.२.२ གསལ་ཁ་མེ་ཏོག་གི་འགྲེལ་བ་རྒྱབ་ཚུགས། ३.२.३ གསལ་ཁ་མེ་ཏོག་གི་ དཔེ་བ་བཤད་ཚུགས། ३.२.४ གསལ་ཁ་མེ་ཏོག་གི་ འཐོབ་ལམ་ཕྱེ་ཚུགས། ३.२.५ གསལ་ཁ་མེ་ཏོག་ ཚོན་གཏང་ཚུགས། ३.२.६ སྤྲོ་བ་དང་གཅིག་སྦྲེལ་ལས་ ལྟ་འབད་ཚུགས།	३.२ གསལ་ཁ་/སེའུ་མེ་ཏོག་ཚོན་ གཏང་ནི།	
३.३.१ མཐོང་གསལ་མེ་ཏོག་གི་ གོ་དོན་བཤད་ཚུགས། ३.३.२ མཐོང་གསལ་མེ་ཏོག་གི་ འགྲེལ་བཤད་རྒྱབ་ཚུགས། ३.३.३ མཐོང་གསལ་མེ་ཏོག་གི་ དཔེ་བ་བཤད་ཚུགས། ३.३.४ མཐོང་གསལ་མེ་ཏོག་གི་ འཐོབ་ལམ་བཤད་ཚུགས། ३.३.५ མཐོང་གསལ་མེ་ཏོག་ ཚོན་གཏང་ཚུགས། ३.३.६ སྤྲོ་བ་དང་གཅིག་སྦྲེལ་ལས་ ལྟ་འབད་ཚུགས།	३.३ མཐོང་གསལ་མེ་ཏོག་ཚོན་ གཏང་ནི།	
४.१.१ པད་མེ་ཏོག་ཁང་ཚོན་/ཁས་ཚོན་གཏང་ནི།	४.१ པད་མེ་ཏོག་ཁང་ཚོན་ /ཁས་ཚོན་ གཏང་ནི།	

๔.๑.๑ པbecr་ཏང་ཚོན་གྱི་ གོ་དོན་བཤད་ཚུགས།		
๔.๑.๒ པbecr་ཏང་ཚོན་གྱི་ འགྲེལ་པ་རྒྱབ་ཚུགས།		
๔.๑.๓ པbecr་ཏང་ཚོན་གྱི་ དབྱེ་བ་བཤད་ཚུགས།		
๔.๑.๔ པbecr་ཏང་ཚོན་གྱི་ འཐོབ་ལམ་སྤེལ་ཚུགས།		
๔.๑.๕ པbecr་ཏང་ཚོན་ གཏང་ཚུགས།		
๔.๑.๖ སྤྱོ་བ་དང་གཅིག་སྦྲེལ་ལས་ ལྟ་འབད་ཚུགས།		
སྒྲིང་ཚན་དང་པ། ཤིང་ཚོན་གྱི་རི་མོ་བྱེ་ན། **སྟོན་ཚན་གསུམ་པ།** གོས་རིས་རིགས་ཀྱི་རི་མོ་བྱེ་ན།		**X**
๓.๑.๑ སྤྱིན་རིས་ཀྱི་ གོ་དོན་ བཤད་ཚུགས།	๓.๑ སྤྱིན་རིས་ཀྱི་རི་མོ་བྱེ་ན།	
๓.๑.๒ སྤྱིན་རིས་ཀྱི་ འགྲེལ་པ་ རྒྱབ་ཚུགས།		
๓.๑.๓ སྤྱིན་རིས་ཀྱི་ འཐོབ་ལམ་ བཤད་ཚུགས།		
๓.๑.๔ སྤྱིན་རིས་ཀྱི་ དབྱེ་བ་ སྤེལ་ཚུགས།		
๓.๑.๕ སྤྱིན་རིས་ཀྱི་ རི་མོ་ བྱེ་ཚུགས།		
๓.๑.๖ སྤྱོ་བ་དང་གཅིག་སྦྲེལ་ལས་ལྟ་འབད་ཚུགས།		
๓.๒.๑ གཡུང་དྲུང་གི་ གོ་དོན་བཤད་ཚུགས།	๓.๒ གཡུང་དྲུང་གི་ རི་མོ་བྱེ་ན།	
๓.๒.๒ གཡུང་དྲུང་གི་ འགྲེལ་བཤད་རྒྱབ་ཚུགས།		
๓.๒.๓ གཡུང་དྲུང་གི་ འཐོབ་ལམ་བཤད་ཚུགས།		
๓.๒.๔ གཡུང་དྲུངཀི་དབྱེ་བ་བཤད་ཚུགས།		
๓.๒.๕ གཡུང་དྲུང་གི་ རི་མོ་བྱེ་ཚུགས།		
๓.๒.๖ སྤྱོ་བ་དང་གཅིག་སྦྲེལ་ལས་ ལྟ་འབད་ཚུགས།		
๓.๓.๑ ཁ་ཆོམ་ གོ་དོན་ བཤད་ཚུགས།	๓.๓ ཁ་ཆོམ་གྱི་རི་མོ་བྱེ་ན།	

༣.༣.༡ ཁ་ཆོས་ འགྲེལ་བཤད་ རྒྱབ་ཚུགས། ༣.༣.༢ ཁ་ཆོས་ འཛོབ་ལམ་ བཤད་ཚུགས། ༣.༣.༤ ཁ་ཆོས་ དེ་མོ་ བྱེ་ཚུགས། ༣.༣.༥ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།		
༣.༤.༡ སྤོས་དེས་གི་གོངྷོན་བཤད་ཚུགས། ༣.༤.༢ སྤོས་དེས་གི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༣.༤.༣ སྤོས་དེས་གི་ཐོབ་ལམ་བཤད་ཚུགས། ༣.༤.༤ སྤོས་དེས་གི་དེ་མོ་བྱེ་ཚུགས། ༣.༤.༥ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.༤ སྤོས་དེས་གི་དེ་མོ་བྱེ་ནི།	
༣.༥.༡ ཀུང་ཀ་རྟ་ཅན་གི་ དོན་བཤད་ཚུགས། ༣.༥.༢ ཀུང་ཀ་རྟ་ཅན་གི་ འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༣.༥.༣ ཀུང་ཀ་རྟ་ཅན་གི་ འཛོབ་ལམ་བཤད་ཚུགས། ༣.༥.༤ ཀུང་ཀ་རྟ་ཅན་གི་ དེ་མོ་བྱེ་ཚུགས། ༣.༥.༥ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.༥ ཀུང་ཀ་རྟ་ཅན་གི་དེ་མོ་བྱེ་ནི།	
༣.༦.༡ ཀུང་ཀ་ཐད་རིལམོ་གི་ དོན་བཤད་ཚུགས། ༣.༦.༢ ཀུང་ཀ་ཐད་རིལམོ་གི་ འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༣.༦.༣ ཀུང་ཀ་ཐད་རིལམོ་གི་ འཛོབ་ལམ་བཤད་ཚུགས། ༣.༦.༤ ཀུང་ཀ་ཐད་རིལམོ་གི་ དེ་མོ་བྱེ་ཚུགས། ༣.༦.༥ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.༦ ཀུང་ཀ་ཐད་རིལམོ་གི་དེ་མོ་བྱེ་ནི།	

སྟོན་ཚན་བཞི་པ། མཆོད་རྟས་འདོད་ཡོན་ ལྔའི་རི་མོ་ བྱི་ནི།		
ৎ.৭.৭ གཟུགས་ཀྱི་ གོ་དོན་བཤད་ཚུགས། ৎ.৭.২ གཟུགས་ཀྱི་ འགྲེལ་བཤད་རྒྱབ་ཚུགས། ৎ.৭.৩ གཟུགས་ཀྱི་ འཐོབ་ལམ་བཤད་ཚུགས། ৎ.৭.ৎ གཟུགས་ཀྱི་ རི་མོ་བྱི་ཚུགས། ৎ.৭.৫ སྟོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	ৎ.৭ གཟུགས་ཀྱི་རི་མོ་ མེ་ལོང་བྱི་ནི།	
ৎ.২.৭ སྒྲའི་གོ་དོན་བཤད་ཚུགས། ৎ.২.২ སྒྲའི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ৎ.২.৩ སྒྲའི་འཐོབ་ལམ་བཤད་ཚུགས། ৎ.২.ৎ སྒྲའི་རི་མོ་བྱི་ཚུགས། ৎ.২.৫ སྟོ་བ་དང་གཅིག་སྒྲིལ་ལས་ ལྟ་འབད་ཚུགས།	ৎ.২ སྒྲའི་རི་མོ་སྒྲ་སྐད་བྱི་ནི།	
ৎ.৩.৭ དྲིའི་གོ་དོན་བཤད་ཚུགས། ৎ.৩.২ དྲིའི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ৎ.৩.৩ དྲིའི་འཐོབ་ལམ་བཤད་ཚུགས། ৎ.৩.ৎ དྲིའི་དབྱེ་བ་བཤད་ཚུགས། ৎ.৩.৫ དྲིའི་དགོས་པ་བཤད་ཚུགས། ৎ.৩.৬ དྲིའི་རི་མོ་བྱི་ཚུགས། ৎ.৩.৶ སྟོ་བ་དང་གཅིག་སྒྲིལ་ལས་ལྟ་འབད་ཚུགས།	ৎ.৩ དྲིའི་རི་མོ་དྲི་ཆབ་ དུང་དཀར་གྱི་རི་མོ་བྱི་ནི།	
ৎ.ৎ.৭ རོ་གི་གོ་དོན་བཤད་ཚུགས། ৎ.ৎ.২ རོ་གི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ৎ.ৎ.৩ རོ་གི་འཐོབ་ལམ་བཤད་ཚུགས།	ৎ.ৎ རོའི་རི་མོ་ཤིང་ཏོག་ བཅལ་བ་བྱི་ནི།	

༤.༤.༤ རོ་གི་དབྱེ་བ་བཤད་ཚུགས། ༤.༤.༥ རོ་གི་རི་མོ་བྱི་ཚུགས། ༤.༤.༦ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།		
༤.༥.༡ རེགཱ་བྱའི་ གོ་དོན་ བཤད་ཚུགས། ༤.༥.༢ རེགཱ་བྱའི་ འགྲེལ་བཤད་ རྒྱབ་ཚུགས། ༤.༥.༣ རེགཱ་བྱའི་ འཛོོབ་ལས་ བཤད་ཚུགས། ༤.༥.༤ རི་མོ་ བྱི་ཚུགས། ༤.༥.༥ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།	༤.༥ རེགཱ་བྱའི་རི་མོ་དང་ དཔྱད་ཞིནི།	
སྦྱོང་ཚན་གཉིས་པ།ཤེར་ཕྱི་ཆོོན་སྦྱོང་ནི།		
སྟོན་ཚན་གཉིས་པ། ཤེར་ཕྱི་ཆོོན་སྦྱོང་ནི།		
༣.༡.༡ བཟང་ཆོོན་ཕྱི་གོ་དོན་བཤད་ཚུགས། ༣.༡.༢ བཟང་ཆོོན་ཕྱི་ དབྱེ་བ་བཤད་ཚུགས། ༣.༡.༣ བཟང་ཆོོན་ཕྱི་འཛོོབ་ལམ་བཤད་ཚུགས། ༣.༡.༤ བཟང་ཆོོན་ སྦྱོང་ཚུགས། ༣.༡.༥ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.༡ བཟང་ཆོོན་སྦྱོང་ནི།	
སྟོན་ཚན་གསུམ་པ། ཤེར་ཆོོན་ཕྱི་ཉང་ཆོོན/ ཉས་ཆོོན་གཉང་ནི།		
༣.༢.༡ དར་དཔྱང་ ཉང་ཆོོན་གཉང་ནིའི་ གོ་དོན་བཤད་ཚུགས། ༣.༢.༢ དར་དཔྱང་ ཉང་ཆོོན་ཕྱི་ འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༣.༢.༣ དར་དཔྱང་ ཉང་ཆོོན་ཕྱི་ འཛོོབ་ལམ་བཤད་ཚུགས། ༣.༢.༤ དར་དཔྱང་ ཉང་ཆོོན་གཉང་ཚུགས། ༣.༢.༥ སྤྱོ་བ་དང་ གཅིག་སྦྱིལ་ལས་ ལྟ་འབད་ཚུགས།	༣.༢ དར་དཔྱང་ཉང་ཆོོན་/ ཉས་ཆོོན་གཉང་ནི།	

३.१.५ དར་དམྱང་ ཉང་ཚོན་གཉང་ནི་ལུ་སྦྲོ་བ་དང་ རྩིས་མཐོང་བསྐྱེད་ཚུགས། ३.१.७ ཨེན་སྡུང་དང་ ལྷན་འབད་བཟོ་ཚུགས།		
སྦྱོན་ཚན་བཞི་པ། ཤིང་ཚོན་གསུམ་མདངས་གཉང་ནི།		
९.१.१ པbecca་མགོ་ལང་མ་ གསུམ་མདངས་གཉང་ནིའི་ གོ་དོན་བཤད་ཚུགས། ९.१.२ པbecca་མགོ་ལང་མ་ གསུམ་མདངས་གཉང་ནིའི་ འགྲེལ་པ་རྟུབ་ཚུགས། ९.१.३ པbecca་མགོ་ལང་མ་ གསུམ་མདངས་གཉང་ནིའི་ འཐོབ་ལམ་ཕྱེ་ཚུགས། ९.१.९པbecca་མགོ་ལང་མ་ གསུམ་མདངས་གི ཉང་ཚུགས། ९.१.५སྦྲོ་བ་དང་གཅིག་སྟིལ་ལས་ ལུ་འབད་ཚུགས། ९.१.६པbecca་མགོ་ལང་མ་ གསུམ་མདངས་གཉང་ནི་ལུ་སྦྲོ་བ་དང་རྩིས་མཐོང་བསྐྱེད་ཚུགས།	९.१ པbecca་མགོ་ལྷམ་གསུམ་ མདངས་གཉང་ནི།	
९.२.१ ནོར་འཛིན་ པ་དྲ་གསུམ་མདངས་ཀྱི་ གོ་དོན་བཤད་ཚུགས། ९.२.२ ནོར་འཛིན་ པ་དྲ་གསུམ་མདངས་ཀྱི་ འགྲེལ་པ་རྟུབ་ཚུགས། ९.२.३ ནོར་འཛིན་ པ་དྲ་གསུམ་མདངས་ཀྱི་ འཐོབ་ལམ་ཕྱེ་ཚུགས། ९.२.९ ནོར་འཛིན་ པ་དྲ་གསུམ་མདངས་ གཉང་ཚུགས། ९.२.५ནོར་འཛིན་པ་དྲ་གསུམ་མདངས་གཉང་ནི་ལུ་སྦྲོ་བ་དང་རྩིས་མཐོང་བསྐྱེད་ཚུགས། ९.२.६ སྦྲོ་བ་དང་གཅིག་སྟིལ་ལས་ ལུ་འབད་ཚུགས། ९.२.२ ཨེན་སྡུང་དང་ ལྷན་འབད་ བཟོ་ཚུགས།	**९.२ ནོར་འཛིན་པ་དྲ་གསུམ་ མདངས་གཉང་ནི།**	

৬.৯.১ ཁ་ཆོམ་གི་ གོ་དོན་བཤད་ཚུགས།	**৬.৯ ཤིང་ལོ་པ་ཏ་གསུམ་ མདངས་གཏང་ནི།**	
৬.৯.২ ཁ་ཆོམ་གི་ འགྲེལ་པ་རྒྱབ་ཚུགས		
৬.৯.৯ ཁ་ཆོམ་གི་ དཔེ་བ་བཤད་ཚུགས།		
৬.৯.৬ ཁ་ཆོམ་གི་ འཐོབ་ལམ་ཕྱེ་ཚུགས།		
৬.৯.৫ ཁ་ཆོམ་གི་ དགོས་པ་བཤད་ཚུགས།		
৬.৯.৮ ཁ་ཆོམ་ ཆོན་གཏང་ཚུགས།		
৬.৯.৭ སྤྱོ་བ་དང་གཅིག་སྦྲེལ་ལས་ ལྟ་འབད་ཚུགས།		
৬.৯.২ ཁ་ཆོམ་ཆོན་གཏང་ནི་ལུ་ སྤྱོ་བ་དང་རྩེས་མཐོང་བསྐྱེད་ཚུགས།		
৬.৯.৮ ཉེན་སྐྱང་དང་ལྡན་འབད་ གཏང་ཚུགས།		
৬.৬.১ ཆོག་རྒྱན་ པ་ཏ་གསུམ་མདངས་གཏང་ནིའི་ གོ་དོན་བཤད་ཚུགས།	**৬.৬ ཆོག་རྒྱན་པ་ཏ་གསུམ་ མདངས་གཏང་ནི།**	
৬.৬.২ ཆོག་རྒྱན་ པ་ཏ་གསུམ་མདངས་གཏང་ནིའི་ འགྲེལ་པ་རྒྱབ་ཚུགས།		
৬.৬.৯ ཆོག་རྒྱན་ པ་ཏ་གསུམ་མདངས་གཏང་ནིའི་ འཐོབ་ལམ་ཕྱེ་ཚུགས།		
৬.৬.৬ ཆོག་རྒྱན་ པ་ཏ་གསུམ་མདངས་གཏང་ཚུགས།		
৬.৬.৫ སྤྱོ་བ་དང་གཅིག་སྦྲེལ་ལས་ ལྟ་འབད་ཚུགས།		
৬.৬.৮ ཆོག་རྒྱན་ པ་ཏ་གསུམ་མདངས་གཏང་ནི་ལུ་སྤྱོ་བ་དང་རྩེས་མཐོང་བསྐྱེད་ཚུགས།		
སྟོན་ཚན་ཨ་པ། ཤིང་ཚོན་རྩོན་ མདངས་གཏང་ནི།		
৭.৭.১ འདོད་ཡོན་ཨ་ རྩོན་མདངས་གཏང་ནིའི་ གོ་དོན་བཤད་ཚུགས།	**৭.৭ འདོད་ཡོན་ཨ་རྩོན་** མདངས་གཏང་ནི།	
৭.৭.২ འདོད་ཡོན་ཨ་ རྩོན་མདངས་གཏང་ནིའི་ འགྲེལ་པ་རྒྱབ་ཚུགས།		

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སྒོང་ཚན་དང་པ། ཤེར་ཕྱིན་གྱི་རི་མོ་བྱེ་ནི། **སྒོན་ཚན་རྒྱག་པ།** མཆོད་ཚུལ་ནོར་བུ་ཆ་བདུན་གྱི་རི་མོ་བྱེ་ནི།		**XI**
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༡.༤.༡ སྐྱོ་འབྲུར་གྱི་གོ་དོན་བཤད་ཚུགས། ༡.༤.༢ སྐྱོ་འབྲུར་གྱི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༡.༤.༣ སྐྱོ་འབྲུར་གྱི་དཔེ་བ་བཤད་ཚུགས། ༡.༤.༤ སྐྱོ་འབྲུར་གྱི་འཐོབ་ལམ་སྟེ་ཚུགས། ༡.༤.༥ སྐྱོ་འབྲུར་བཟོ་ཚུགས།	༡.༤ སྐྱོ་འབྲུར་བཟོ་ནི།	
སྟོན་ཚན་གཉིས་པ། ཤིང་གྱི་ཆོག་སྤྱོར་ནི།		
༢.༡.༡ གྲིབ་ཆོག་གྱི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༢.༡.༢ གྲིབཆོག་གྱི་དཔེ་བ་སྟེ་ཚུགས། ༢.༡.༣ གྲིབ་ཆོག་གྱི་འཐོབ་ལམ་བཤད་ཚུགས། ༢.༡.༤ གྲིབ་ཆོག་རྩ་བའི་ཆོག་གྱི་མིང་། ༢.༡.༥ ཆོག་སྤྱོར་ཐང་། ༢.༡.༦ གྲིབ་ཆོག་སྐྱུཔ་གྱི་མིང་། ༢.༡.༧ གྲིབ་ཆོག་ལྷན་ཐབས། ༢.༡.༨ ཤིང་ཆོག་དོན་ལུ་གྲིབ་ཆོག་སྐྱུཔ་གི་བསྟུན་ཚད། ༢.༡.༩ གྲིབ་ཆོག་སྤྱོར་ཚུགས། ༢.༡.༡༠ སྤྱོ་བ་དང་གཅིག་སྦྱིལ་ཐོག་ལས་ལྷ་འབད་ཚུགས།	༢.༡ གྲིབ་ཆོག་སྤྱོར་ནི།	

སྟོན་ཚན་ལྔ་པ། ཤིང་ཚོན་རྩོན་མདངས་གཏང་ནི།		
५.१.१ ཚོན་གཏང་སའི་ས་སྐོ་ཤེས་ཚུགས། ५.१.२ ཚོན་གྱི་ཐོབ་ཐང་ཤེས་ཚུགས། ५.१.३ ཚོན་མདངས་གི་སྐོར་ལས་ཤེས་ཚུགས། ५.१.४ ཚོན་མདངས་གཏང་ཚུགས། ५.१.५ ཉེན་སྐྱང་དང་ལྡན་འབད་བཟོ་ཚུགས།	५.१ ཐོར་བུ་ཆ་བདུན་རྩོན་མདངས་གཏང་ནི།	
སྐྱོང་ཚན་དང་པ། ཤིང་ཚོན་གྱི་རི་མོ་བྱེ་ནི། **སྟོན་ཚན་བརྒྱད་པ།** གཟུགས་བརྙན་འདྲབ་ཆགས་རིགས་ཀྱི་རི་མོ་བྱེ་ནི།		XII
४.१.१ ཁྲུང་ཁྲུང་གི་ཚོ་དོན་བཤད་ཚུགས། ४.१.२ ཁྲུང་ཁྲུང་གི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ४.१.३ ཁྲུང་ཁྲུང་གི་གི་ཐོབ་ལམ་བཤད་ཚུགས། ४.१.४ ཁྲུང་ཁྲུང་གྱི་རི་མོ་བྱེ་ཚུགས། ४.१.५ པོ་བ་དང་གཅིག་སྒྲིལ་ཐོག་ལས་ལྟ་འབད་ཚུགས།	४.१ འདྲ་ཆགས་ཁྲུང་ཁྲུང་གི་རི་མོ་བྱེ་ནི།	
४.२.१ འདྲ་ཆགས་རྩ་བྱའི་གྱི་ཚོ་དོན་བཤད་ཚུགས། ४.२.२ འདྲ་ཆགས་རྩ་བྱའི་གྱི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ४.२.३ འདྲ་ཆགས་རྩ་བྱའི་ཐོབ་ལམ་བཤད་ཚུགས། ४.२.४ འདྲ་ཆགས་རྩ་བྱའི་གྱི་རི་མོ་བྱེ་ཚུགས། ४.२.५ སྤོ་བ་དང་གཅིག་སྒྲིལ་ཐོག་ལས་ལྟ་འབད་ཚུགས	४.२ འདྲ་ཆགས་རྩ་བྱའི་རི་མོ་བྱེ་ནི།	
४.३.१ བྱ་ཚེ་རིང་གི་ཚོ་དོན་བཤད་ཚུགས། ४.३.२ བྱ་ཚེ་རིང་གི་འགྲེལ་བཤད་རྒྱབ་ཚུགས།	४.३ འདྲ་ཆགས་བྱ་ཚེ་རིང་གི་རི་མོ་བྱེ་ནི།	

༡.༣.༣ བྱ་ཚེ་རིང་གི་འཐོབ་ལམ་བཤད་ཚུགས། ༡.༣.༤ བྱ་ཚེ་རིང་གི་རི་མོ་བྱེ་ཚུགས། ༡.༣.༥ སྤྱོ་བ་དང་གཅིག་སྤྲིལ་ལས་ལྷ་འབད་ཚུགས།		
སྤྱིན་ཚན་དགུས། དམིགས་བསལ་མཚན་བྱེད་གཟུགས་ བརྟན་རིགས་ཀྱི་རི་མོ་བྱེ་ནི།		
༥.༡.༡ ཅོ་ཁ་ཏ/ཅི་མ་འདྲའི་རི་མོ་གྱི་དགོད་པ་བཤད་ཚུགས། ༥.༡.༢ ཅོ་ཁ་ཏ/ཅི་མ་འདྲའི་རི་མོ་གྱི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༥.༡.༣ ཅོ་ཁ་ཏ/ཅི་མ་འདྲའི་རི་མོ་བྱེ་ནི་ཐོབ་ལམ་བཤད་རྒྱབ་ཚུགས། ༥.༡.༤ ཅོ་ཁ་ཏ/ཅི་མ་འདྲ་བྱེ་ཚུགས། ༥.༡.༥ སྤྱོ་བ་དང་གཅིག་སྤྲིལ་ཐོག་ལས་ལྷ་འབད་ཚུགས།	༥.༡ ཅོ་ཁ་ཏ/ཅི་མ་འདྲའི་ རི་མོ་བྱེ་ནི།	
༥.༢.༡ རི་དྭགས་ཆོས་འཁོར་གྱི་རི་མོ་གྱི་གོ་དོན་བཤད་ཚུགས། ༥.༢.༢ རི་དྭགས་ཆོས་འཁོར་གྱི་རི་མོ་གྱི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༥.༢.༣ རི་དྭགས་ཆོས་འཁོར་གྱི་ཐོབ་ལམ་བཤད་ཚུགས། ༥.༢.༤ རི་དྭགས་ཆོས་འཁོར་གྱི་རི་མོ་བྱེ་ཚུགས། ༥.༢.༥ སྤྱོ་བ་དང་གཅིག་སྤྲིལ་ཐོག་ལས་ལྷ་འབད་ཚུགས	༥.༢ རི་དྭགས་ཆོས་འཁོར་གྱི་ རི་མོ་བྱེ་ནི།	
༥.༣.༡ དང་མཆོ་རལ་གྲིའི་གྱི་རི་མོ་གྱི་གོ་དོན་བཤད་ཚུགས། ༥.༣.༢ དང་མཆོ་རལ་གྲིའི་གྱི་རི་མོ་གྱི་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ༥.༣.༣ དང་མཆོ་རལ་གྲིའི་ཐོབ་ལམ་བཤད་རྒྱབ་ཚུགས། ༥.༣.༤ དང་མཆོ་རལ་གྲིའི་གྱི་རི་མོ་བྱེ་ཚུགས། ༥.༣.༥ སྤྱོ་བ་དང་གཅིག་སྤྲིལ་ཐོག་ལས་ལྷ་འབད་ཚུགས།	༥.༣ དང་མཆོ་རལ་གྲིའི་ ཇོ་མོ་བཅོན་དམ་པ། རི་མོ་བྱེ་ནི།	
སྤྱོང་ཚན་གཉིས་པ། ཤེང་ཚོན་གཏང་ནི། **སྤྱོན་ཚན་བཞི་པ།** ཤེང་ཚོན་གསུམ་མདངས་གཏང་ནི།		

๔.๑.๑ བྱ་ཚེ་རིང་གསུམ་མདངས་གཏང་ནི་གྱི་གོ་དོན་བཤད་ཚུགས། ๔.๑.๒ ཆོག་བཏང་སའི་ས་སྒོ་བཤད་ཚུགས། ๔.๑.๓ བྱ་ཚེ་རིང་གི་ཆོག་གྱི་ཐོབ་ལམ་ཚུགས། ๔.๑.๔ བྱ་ཚེ་རིང་གསུམ་མདངས་གཏང་ཚུགས། ๔.๑.๕ སྤྲོ་བ་དང་གཅིག་སྒྲིལ་ཐོག་ལས་ལྟ་འབད་ཚུགས།	๔.๑ བྱ་ཚེ་རིང་གསུམ་མདངས་གཏང་ནི།	
๔.๒.๑ ཅོ་ཁ་ཏ/ཅི་མ་འདྲའི་གསུམ་མདངས་གཏང་ནི་གྱི་གོ་དོན་བཤད་ཚུགས། ๔.๒.๒ ཆོག་བཏང་སའི་ས་སྒོ་བཤད་རྒྱབ་ཚུགས། ๔.๒.๓ ཅོ་ཁ་ཏ/ཅི་མ་འདྲའི་ཆོག་ཐོབ་ལམ་བཤད་ཚུགས། ๔.๒.๔ ཅོ་ཁ་ཏ/ཅི་མ་འདྲའི་གསུམ་མདངས་གཏང་ཚུགས། ๔.๒.๕ སྤྲོ་བ་དང་གཅིག་སྒྲིལ་ཐོག་ལས་ལྟ་འབད་ཚུགས།	๔.๒ ཅོ་ཁ་ཏ/ཅི་མ་འདྲ་གསུམ་མདངས་གཏང་ནི།	

ANNEXURE VII: TSEMZO (TAILORING)

ཇ ཆོམ་བཟོའི་ཆོས་ཚན་རྩ་གཞུང་གི་ནང་དོན་བཀོད་རིས། ཀ

Instructional hours

སྡེབ་རིམ། Class	སྡེབ་ཚན། Module	སྟོན་ཚན། (Chapter)	སྡེབ་ཚན། (Lessons)	ཚུ་ཚོད། ཡོངས་སྡོམ། (Total)
	སྡེབ་ཚན་དང་པ། དཀྱི་ར་བཅོམ་ནི།	སྟོན་ཚན་དང་པ། ཉེན་སྐྱོང་གི་སྐོར།	๑.๑ 5S གིས་རྩ་དོན་ལག་ལེན་འཐབ་ནི། (5S principles) ๑.๒ ལྟ་གི་འཕྲོད་བསྟེན་དང་ཉེན་སྐྱོང་ལག་ལེན་འཐབ་ནི། (OHS) ๑.๓ རང་གི་ཉེན་སྐྱོང་གི་མཁོ་ཆས་ལག་ལེན་འཐབ་ནི། (PPE) ๑.๔ ས་སྒོ་ཉོན་སྐྱོང་དང་ལྡན་སྒེ་བཞག་ནི།	๑๐

IX		སྟོན་ཚན་གཉིས་པ། འཕྲུལ་ཆས་ཉམས་བཅོས་འབད་ནི། པ ཨཨབལལངང ཡཨཡིངངང	༢.༡ འཕྲུལ་ཆོམ་ལགཱ་ལེན་འཐབ་ནི། ༢.༢ འཕྲུལ་ཁབ་སྟོམ་སྒྲིག་འབད་ནི། ༢.༣ འཕྲུལ་སྐྱམ་བླུག་ནི། ༢.༤ འཕྲུལ་ཐག་ཐད་ཕྲང་བཀལ་ནི། ༢.༥ འཕྲུལ་གཟེར་བསྡམ་ནི་དང་ཞྭ་ནི། ༢.༦ ཆོམ་ཁང་རྒྱུན་སྐྱོང་འབད་ནི།	༡༠༡
		སྟོན་ཚན་གསུམ་པ། པང་ཐགས་འཕྲུལ་ཐགས་དང་དཀར་རྒྱང་དཀྱི་ར་བཅོམ་ནི།	༣.༡ རྒྱུ་ཆས་དང་ཅ་ཆས་མཁོ་སྒྲུབ་འབད་ནི། ༣.༢ དཀྱི་ར་ཚད་ལེན་ནི། ༣.༣ དཀྱི་ར་ཁི་དུམ་བཟོ་ནི།(འཕྲུལ་ཐགས) ༣.༤ དཀྱི་ར་ཁི་ཁ་སྒྲིག་ནི། ༣.༥ དཀྱི་ར་མ་བཟོ་ནི། ༣.༦ འཛའ་དྲ་ནི།	༢༧
			བསྡོམས།	༡༣༧

སློབ་རིམ། Class	སྡེར་ཚན། Module	སྟོན་ཚན། (Chapter)	སློབ་ཚན། (Lessons)	ཚུ་ཚོད་ཡོངས་སྡོམ། (Total)
X	སྡེར་ཚན་དང་པ། (continued) དཀྱི་ར་བཅོམ་ནི།	སྟོན་ཚན་གསུམ་པ། (continued) པང་ཐགས་འཕྲུལ་ཐགས་དང་དཀར་རྒྱང་དཀྱི་ར་བཅོམ་ནི།	༣.༧ སྐུད་པ་ཆོས་གཞི་བསྒྲིག་ནི། ༣.༨ སྐུད་པ་བསྡམ་སྡོད་བལྟ་ནི། ༣.༩ སོ་ཆེམ་/ལྷས་ཆེམ་རྒྱབ་ནི། ༣.༡༠ གོམ་ཚད་བཀལ་ནི། ༣.༡༡ དཀྱི་ར་མ་མཐུད་རྒྱབ་ནི། ༣.༡༢ དཀྱི་ར་སོ་སྒྲིལ་རྒྱབ་ནི། ༣.༡༣ འཛའ་བཀལ་ནི།	༨༩.༥

		སྟོན་ཚན་བཞི་པ། མཇུག་བསྡུ་ནི	๔.๑ དབུང་ཏི་རུབ་ནི། ๔.๒ ཏུམ་ཆ་བཏོན་ནི། ๔.๓ བལྟབ་ནི། ๔.๔ ཆེམ་གླ་ལེན་ནི།	๔๲.๫
				བསྡོམས། ๑๓๑

སློབ་དེམ། Class	སྡེར་ཚན། Module	སྟོན་ཚན། (Chapter)	སློབ་ཚན། (Lessons)	ཆུ་ཚོད། ཡོངས་སྡོམ། (Total)
XI	སྡེར་ཚན་གཉིས་པ། སྟོད་གོ་བཅོམ་ནི།	སྟོན་ཚན་དང་པ། སྟོད་གོས་གྲ་སྒྲིག་འབད་དེ་བཅོམ་ནི།	๑.๑ སྟོད་གོའི་རྒྱུ་ཚས་དང་ཅ་ཚས་མཚོ་སྒྲུབ་འབད་ནི། ๑.๒ རྩ་ཕྲང་བཀལ་ནི། ๑.๓ ཚད་ལེན་ནི། ๑'๔ གོང་དྲི་ནི་དང་ སྒོག་ནི། ๑'๕ སྟོད་གོ་བཟོ་བཀོད་འབད་དེ་དྲ་ནི། ๑'๖ ཕྱ་དྲུང་དང་ཕྱ་དྲུང་ཁ་དྲ་ནི། ๑'๗ ལྷས་ཆེམ་རྒྱབ་ནི། ๑'๘ སྟོད་གོ་བཅོམ་ནི། ๑'๙ མཇུག་བལྟབ་ནི་དང་གོང་བཀལ་ནི། ๑.๑๐ ཕྱ་དྲུང་བཅོམ་ནི།	๑๔๲
		སྟོན་ཚན་གཉིས་པ། ཤན་སྦྱར་སྟོད་གོ་བཅོམ་ནི།	๒'๑ གོང་དྲ་ཏེ་བཅོམ་ནི། ๒.๒ ལཁ་ཆུན་དྲ་སྟེ་བཅོམ་ནི ๒.๓ ཤན་སྦྱར་སྟོད་གོ་ཚད་ལེན་ཏེ་དྲ་ནི། ๒.๔ ཤན་སྦྱར་སྟོད་གོ་བཅོམ་ནི།	๕๐
				བསྡོམས། ๑๙๒

སློབ་དེམ། Class	སྡེར་ཚན། Module	སྟོན་ཚན། (Chapter)	སློབ་ཚན། (Lessons)	ཆུ་ཚོད། ཡོངས་སྡོམ། (Total)
XII	སྡེར་ཚན་གཉིས་པ། སྟོད་གོ་བཅོ	སྟོན་ཚན་གསུམ་པ། འོན་འཇུ་བཅོམ་ནི།	๓.๑ འོན་འཇུ་གི་རྒྱུ་ཚས་དང་ཅ་ཚས་མཚོ་སྒྲུབ་འབད་ནི། ๓.๒ འོན་འཇུ་ཚད་ལེན་ཏེ་བཟོ་བཀོད་འབད་དེ་དྲ་ནི།	๙๲

	མ་ནི།(continued)		३.३ འོན་འཇུ་བཅོམ་དང་བརྟབ་ཚེམ་ཆུབ་ནི།	
		སྟོན་ཚན་བཞི་པ། པི་སི་སྟོད་དང་དབྱུལ་ཁུག་བཅོམ་ནི། (Pencil case/bag)	९.१ པི་སི་སྟོད་དང་དབྱུལ་ཁུག་བཟོ་ནི་གི་ཆུ་ཆ་མཁོ་སྒྲུབ་འབད་ནི། ९.२ པི་སི་སྟོད་ ཚད་ལེན་ཏེ་བཟོ་བཀོད་འབད་དེ་དྲ་ནི། ९.३ པི་སི་སྟོད་བཅོམ་ནི། ९.४ དབྱུལ་ཁུ་བཅོམ་ནི།	१००
				བསྟོམས། १८३

Class-wise Competencies

1) CLASS IX COMPETENCIES

१ 5s གི་རྩ་དོན་འདི་ནམ་འབད་རུང་ལགས་ལེན་འཐབ་ཚུགས།

२ ལྟ་གི་འཕོད་སྟོན་དང་ཉེན་སྐུང་གི་བྱ་སྒོའི་རིམ་པ་ལགས་ལེན་འཐབ་ཚུགས།

३ ཉེན་སྐུང་གི་མཁོ་ཚས་ཚུ་དགོས་མཁོ་དང་འཁྲིལ་ལགས་ལེན་འཐབ་ཚུགས།

९ ཆེམ་གི་ ཅ་ཚས་ཚུ་ ཚུལ་འཐུན་སྒེ་ས་སྒོ་ཉེན་སྐུང་དང་ལྡནམ་འབད་ ལགས་ལེན་འཐབ་ཚུགས།

५ འཕྲུལ་ཆེམ་ཀྱི་རིགས་ཚུ་དབྱེ་བ་ཕྱི་ཞིནམ་ལས་འཕྲུལ་ཆས་ལེགས་ཤོམ་འབད་ལགས་ལེན་འཐབ་ཚུགས།

६ འཕྲུལ་ཆེམ་རིགས་ཀྱི་ཁབ་ཚུ་དབྱེ་བ་ཕྱི་ཏེ་འཕྲུལ་ཁབ་སྟོམས་སྒྲིག་འབད་ཚུགས།

७ འཕྲུལ་ཆེམ་རིགས་མ་འདྲཔ་ཚུ་ལུ་དགོ་པའི་འཕྲུལ་སྐྱམ་ལེགས་ཤོམ་སྒེ་ལགས་ལེན་འཐབ་ཚུགས།

८ འཕྲུལ་ཐག་འཁོར་ལོ་ནང་ཐགས་ཐད་ཕྲང་སྟེ་བཀལ་ཚུགས།

९ འཕྲུལ་གཟེར་ཕྱེ་ནི་དང་སྐམ་ནི་ཚུ་ མ་འཛོལ་བར་ལེགས་ཤོམ་སྒེ་ ལགས་ལེན་འཐབ་ཚུགས།

१० ཆེམ་ཁང་རྒྱུན་སྐྱོང་འབད་ནི་འཛོན་ཐངས་ཅན་འབད་ཚུགས།

११ ཆུ་ཆས་དང་ཅ་ཚས་ སྐུས་ཚད་ཅན་ མཁོ་སྒྲུབ་འབད་དེ་ལགས་ལེན་འཐབ་ཚུགས།

१२ བྱ་སྒོའི་རིམ་པ་དང་འཁྲིལ་ཏེ་ ཚད་ལེན་ཚུགས།

๑๓ དུམ་ལྷམ་པ་མ་འདྲཔ་ཡོད་མི་ཚུ་ ཐིག་ཚད་ཀྱི་ཐོབ་ལམ་དང་འཁྲིལ་མ་བཟོ་ཚུགས།

๑๔ དཀྱི་ར་བཅོམ་ད་ཁ་ལེགས་ཤོམ་འབད་སྒྲིགས་ཚུགས།

๑๕ དུམ་ལྷམ་པ་མ་འདྲཔ་ཡོད་མི་ཚུ་ ཐིག་ཚད་ཀྱི་ཐོབ་ལམ་དང་འཁྲིལ་ཏེ་མ་བཟོ་ཚུགས།

๑๖ འཛའ་དྲ་ཐངས་ཀྱི་རིམ་པ་དང་ཐོབ་ལམ་འཁྲིལ་ཏེ་དྲ་ཚུགས།

2) CLASS X COMPETENCIES

๑ དཀྱི་ར་གི་གཞི་དང་འཁྲིལ་ཏེ་སྐུདཔ་ཆོ་གཞི་སྒྲིག་ཚུགས།

๒ ཆོམ་གྱི་ལུ་འབད་བའི་སྐབས་ སྐུདཔ་དམ་སྟོད་རན་ཏོག་ཏོ་ཡོད་མེད་བརྟག་འབད་དེ་ལག་ལེན་འཐབ་ཚུགས།

๓ འཕྲུལ་ཆས་ལྷས་ཆོམ/སོ་ཆོམ་ཀྱི་ཁབ་དང་སྐུདཔ་ཀྱི་དབྱེ་བ་ཕྱེ་ཏེ་ལག་ལན་འཐབ་ཚུགས།

๔ རྒྱུ་ཆས་དང་བསྟུན་པའི་གོམ་ཚད་ཚུལ་མཐུན་སྒེ་བདེ་སྒྲིགས་འབད་ཏེ་ལག་ལེན་འཐབ་ཚུགས།

๕ དཀྱི་ར་མ་མཐུད་རྒྱབ་པའི་སྐབས་ རྒྱུ་ཆ་ཕྱི་ནང་བལྟ་ཞིན་ལས་རྒྱུ་ཆའི་ཁ་སྒྲིགས་ཏེ་བཅོམ་ཚུགས།

๖ དཀྱི་རའི་རྒྱུ་ཆས་ཚུ་ སོ་སྒྲིལ་སྟོམ་ཏོག་ཏོ་འབད་བཅོམ་ཚུགས།

๗ འཛའ་གི་ཐོབ་ལམ་དང་འཁྲིལ་ཏེ་ དཀྱི་ར་འཛའ་གི་སྒྲིང་སྟོད་རན་ཏོག་ཏོ་སྒེ་བཀལ་ཚུགས།

๘ རྒྱུ་ཆའི་སྤུས་ཚད་དང་བསྟུན་ དབྱར་སྐྱི་ཤུགས་ཚད་རན་ཏོག་ཏོ་སྒེ་རྒྱབ་ཚུགས།

๙ སྐུདཔ་རོ་རྒ་ལས་མེད་པའི་ དུམ་ཆ་བཏོན་ཚུགས།

๑๐ དཀྱི་རའི་ཟླའི་མཐའམ་ཐང་སྐེ་བལྟབ་ཚུགས།

๑๑ ཆོང་མཁོན་པའི་དགོས་མཁོ་དང་འཁྲིལ་ ཀུ་ཆ་སྟོན་རྩིས་བཏོན་ཚུགས།

3) CLASS XI COMPETENCIES

๑ སྟོད་གོ་རྒྱུ་ཆས་དང་ ཅ་ཆས་ཀྱི་རིགས་ཚུ་དབྱེ་བ་ཕྱེ་ཞིན་མ་ལས་ མཁོ་སྤྱབ་འབད་ཚུགས།

๒ སྟོད་གོ་ཚད་ལེན་ཏེ་ གོང་གི་རྩ་ ཕུ་དུང་གི་རྩ་ཚུ་དང་ཏེ་ བཅོམ་ཚུགས།

๓ སྟོད་གོ་རྒྱུ་ཆས་ མཁོ་སྤྱབ་འབད་ཏེ་ ཚད་ལེན་ཚུགས།

๔ སྟོད་གོ་ཁད་ཚད་དང་འཁྲིལ་ ཚད་ལེན་ཞིན་མ་ལས་གོང་དུ་ནི་དང་ སྟོས་གོའི་མ་གོང་སྒོག་ཚུགས།

๕ སྟོད་གོ་རྒྱུ་ཆས་རིགས་ཚུ་ དབྱེ་བ་ཕྱེ་ཞིན་མ་ལས་ཐིག་ཚད་ལེན་ཐངས་ དབྱིབ་བཏོན་ཐངས་ ཁ་སྒྲིགས་ཏེ་དྲ་ཚུགས།

๖ ཕུ་དུང་དང་ཕུ་དུང་ཁ་ཚད་གཞི་དང་བསྟུན་ཏེ་དྲ་ཚུགས།

๗ དཀྱི་ར་ དུམ་བཟོ་ཚར་ཞིན་མ་ལས་ ལྷས་ཆོམ་རྒྱབ་ཚུགས།

๘ སྟོད་གོ་རྒྱུ་ཆས་རིགས་མ་འདྲཔ་ཚུ་དབྱེ་བ་ཕྱེ་སྤྱས་ཚད་དང་སྦུནམ་སྒེ་བཅོམ་ཚུགས།

๙ སྟོད་གོ་བཅོམ་ད་ མཇུག་བལྟབ་ནི་དང་ གོང་བཀལ་ཏོམ་ཏོག་ཏོ་འབད་བཀལ་ཚུགས།

๑๐ ཕུ་དུང་བཅོམ་པའི་སྐབས་ རྩ་ཕྲང་ཏེ་ བཅོམ་ཚུགས།

๑๑ མ་གི་ཚད་གཞི་དང་འཁྲིལ་ ཚད་ལེན་ཏེ་ གོང་རིང་ཐུང་དྲ་ཚུགས།

༡༢ ལག་རྩྭན་དྲ་ཐངས་དང་ བཟོ་བཀོད་འབད་བཅོམ་ཚུགས།

༡༣ མི་གཟུགས་སྟོབས་དང་འཁྲིལ་ཚད་ལེན་ཏེ་ཤན་འཇར་སྟོད་གོས་དྲ་ཚུགས།

༡༤ ཤན་སྦྱར་སྟོད་གོས་དབྱེ་བ་ཕྱི་ཏེ་བཅོམ་ཚུགས།

4) CLASS XII COMPETENCIES

༡ འོན་འཇུ་རྒྱུ་ཆས་དང་ཅ་ཆས་དབྱེ་བ་ཕྱི་ཏེ་ མཁོ་སྒྲུབ་འབད་ཚུགས།

༢ འོན་འཇུ་ དཔེ་ཚད་དང་འཁྲིལ་ཏེ་འོན་འཇུ་ཚད་ལེན་ཏེ་བཟོ་བཀོད་འབད་དེ་དྲ་ཚུགས།

༣ འོན་འཇུ་རྒྱུ་ཆས་དང་ ཅ་ཆས་དབྱེ་བ་ཕྱི་ཏེ་ བརྡབ་བཅོམ་རན་ཏོག་ཏོ་སྦྱ་རྒྱབ་ཚུགས།

༤ པི་སི་སྟོད་དང་དཀྱལ་ཁུག་བཟོ་ནི་གི་ རྒྱུ་ཆ་མཁོ་གྲུབ་འབད་ཚུགས།

༥ པི་སི་སྟོད་དང་དཀྱལ་ཁུག་ བཟོ་རྣམ་དང་དབྱིབས་ བཟོ་བཀོད་འབད་དེ་བཅོམ་ཚུགས།

༦ པི་སི་སྟོད་ཀྱི་སྤྱིལ་ཚད་ལེན་ཏེ་བཟོ་བཀོད་འབད་དེ་དྲ་ནི་དང་ སྤྱིལ་གི་མ་དང་ཅིག་ཁང་ སྐུད་མཚོ་དཞི་འཇུ་ཉིད་བལྟ་ཏེ་དྲ་ཚུགས།

༧ ཤེབ་ཤེབ་དང་སྤྱིལ་བཙུགས་ཏེ་ པི་སི་སྟོད་ཀྱི་དབྱིབས་བཟོ་བཀོད་འབད་དེ་བཅོམ་ཚུགས།

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	Core concepts (Chapters/Topics)	Class
	སྒོང་ཚན་༡ པ། དཀྱི་ར་བཅོམ་ནི།	
	སྟོན་ཚན་དང་པ། ཉེན་སྐྱོང་གི་སྐོར།	IX
༡.༡.༡ 5S གི་དགོས་པ་བཤད་ཚུགས།	༡.༡ 5S གི་རྩ་དོན་ལག་ལེན་ འཐབ་ནི། (5S principle)	
༡.༡.༢ 5S གི་རྩ་དོན་སྐོར་ལས་བཤད་པ་རྒྱབ་ཚུགས།		
༡.༡.༣ 5S གི་རྩ་དོན་ལག་ལེན་འཐབ་དགོ།		
༡.༢.༡ ལྟ་གི་འཛོད་བསྟེན་དང་ཉེན་སྐྱོང་གི་དགོས་པ་བཤད་ཚུགས།	༡.༢ ལྟ་གི་འཛོད་བསྟེན་དང་ ཉེན་སྐྱོང་ལག་ལེན་འཐབ་ནི།(OHS)	
༡.༢.༢ ལྟ་གི་འཛོད་བསྟེན་དང་ཉེན་སྐྱོང་གལ་ཅན་བརྩི་འཛོག་བཤད་ཚུགས།		
༡.༢.༣ ལྟ་འབད་སའི་ས་སྐོ་ནང་ལུ་གློ་བུར་གྱི་རྒྱུན་ངོས་འཛིན་འབད་དགོ།		

๑.๓.๙ ལྕ་གི་འཕྲོད་བསྟེན་དང་སྟེན་སྲུང་ཡག་ལེན་འཐབ་ཚུགས། Wangsel		
๑.๓.๑ རང་གི་ཉེན་སྲུང་གི་མཁོ་ཆས་སྐོར་ལས་འགྲེལ་བཤད་རྒྱབ་ཚུགས། ๑.๓.๒ རང་གི་ཉེན་སྲུང་གི་མཁོ་ཆས་ཐོ་བཀོད་ཚུགས། ๑.๓.๓ རང་གི་ཉེན་སྲུང་གི་མཁོ་ཆས་ངོས་འཛིན་འབད་ཚུགས། **๑.๓.๙ རང་གི་ཉེན་སྲུང་གི་མཁོ་ཆས་ཡག་ལེན་འཐབ་དགོ།**	**๑.๓ རང་གི་ཉེན་སྲུང་གི་ མཁོ་ཆས་ ཡག་ལེན་འཐབ་ནི། (PPE)**	
๑.๙.๑ ཅ་ཆས་དང་ལྡན་པའི་ཉེན་སྲུང་བཤད་ཚུགས།། ๑.๙.๒ ཉེན་སྲུང་གི་དབྱེ་བ་བཤད་ཚུགས། ๑.๙.๓ ཉེན་སྲུང་གི་བཅའ་ཡིག་བཤད་ཚུགས། ๑.๙.๙ ས་སྐོ་ཉེན་སྲུང་བཤད་ཚུགས། ๑.๙.๕ ཉེན་སྲུང་མཁོ་ཆས་ཀྱི་ངོ་སྤྲོད་བཤད་ཚུགས། ๑.๙.๖ ཆོང་མཁྲོན་པའི་ཉེན་སྲུང་བཤད་ཚུགས། ๑.๙.๗ བསམ་སྤྱོད་ལས་བཟེན་པའི་ཉེན་སྲུང་བཤད་ཚུགས། *๑.๙.๙ ཐོག་བྱང་སྐན་བཅོས་ཡག་ལེན་འཐབ་དགོ།*	**๑.๙ ས་སྐོ་ཉེན་སྲུང་དང་ ལྡན་མ་སྟེ་བཞག་ནི།**	
སྟོན་ཚན་གཉིས་པ། འཕྲུལ་ཆས་ཉམས་བཅོས་འབད་ནི།		
๒.๑.๑ འཕྲུལ་ཆོམ་ཀྱི་སྐོར་ལས་བཤད་ཚུགས། ๒.๑.๒ འཕྲུལ་ཆོམ་གྱི་དབྱེ་བ་བཤད་ཚུགས། ๒.๑.๓ ཉེན་སྲུང་ཡག་ལེན་འཐབ་ཚུགས། ๒.๑.๙ འཕྲུལ་ཆོམ་གྱི་འཁོར་ལོ་དང་ཤུང་ཁྲབ་རྒྱབ་ཚུགས། ๒.๑.๕ ཁྲང་ཁྱི་གུ་སྐྱུབ་དཀྱི་ཚུགས། ๒.๑.๖ ཁྲང་ཁྱི་སྐྱུད་ཚད་ནད་བཙུགས་ཚུགས།	**๒.๑ འཕྲུལ་ཆོམ་ཡག་ལེན་ འཐབ་ནི།**	

༡.༡.ཅ སྐྱེད་ཚད་འཕྲུལ་ཆེམ་གྱ་བཙུགས་ཚུགས།		
༡.༡.ཀ འཕྲུལ་ཆེམ་གྱ་ལྷག་སྐྱེད་བཙུ་ཚུགས།		
༡.༡.ཁ འོག་སྐྱེད་འཕྲུལ་སྟེགས་གྱ་སྟོན་ཚུགས།		
༡.༡.ཁ༠ འཕྲུལ་ཆས་དང་ཁབ་ཚུ་ལག་ལེན་ལེགས་ཤོམ་འབད་འཐབ་དགོ།		
༡.༡.ཁ༡ *སྐྱེད་བཙུ་བའི་སྐབས་ལྷོད་ལྷོད་སྤེ་འབད་དགོ།*		
༡.༡.ཁ༢ *སྐྱེད་བཙུ་སའི་ས་སྐོ་ཚུ་ངོས་འཛིན་དེས་ཏིག་ཤེས་ཞིན་མ་ལས་སྐྱེད་ཁབ་ཀྱ་བཙུ་དགོ།*		
༡.༢.༡ འཕྲུལ་ཁབ་ཀྱི་སྐོར་ལས་བཤད་ཚུགས།	༡.༢ འཕྲུལ་ཁབ་སྟོམ་སྒྲིག་འབད་ནི།	
༡.༢.༢ འཕྲུལ་ཁབ་ཀྱི་དབྱེ་བ་བཤད་ཚུགས།		
༡.༢.༣ འཕྲུལ་ཆེམ་གྱ་ཁབ་རྒྱབ་མདུན་མ་འཛོལ་བ་བཙུགས་ཚུགས།		
༡.༢.ཉ འཕྲུལ་ཆེམ་གྱ་ཁབ་བཙུགས་ཚུགས།		
༡.༢.ཅ འཕྲུལ་ཁབ་སྟོམ་སྒྲིག་འབད་དགོ།		
༡.༣.༡ འཕྲུལ་སྒོམ་ཀྱི་དབྱེ་བ་བཤད་ཚུགས།	༡.༣ འཕྲུལ་སྒོམ་བྱུགས་ནི།	
༡.༣.༢ འཕྲུལ་སྒོམ་བྱུགས་དགོ་པའི་དགོས་པ་བཤད་ཚུགས།		
༡.༣.༣ འཕྲུལ་སྒོམ་བྱུགས་པའི་སྐབས་ཚད་ལྡན་སྒེ་བྱུགས་ཚུགས།		
༡.༣.ཉ འཕྲུལ་སྒོམ་འདི་ཉིན་ལྟར་ལུ་འགོ་མ་བཙུགས་པའི་ཉེ་མ་ཚར་རེ་བྱུགས་དགོ།		
༡.ཉ.༡ འཕྲུལ་ཐག་ཕྱང་བཀལ་དགོ་པའི་དགོས་པ་བཤད་ཚུགས།	༡.ཉ འཕྲུལ་ཐག་ཕྱང་བཀལ་ནི།	
༡.ཉ.༢ འཕྲུལ་ཆེམ་གྱི་འཁོར་ལོ་གོང་འོག་གཉིས་ཐག་རིང་ཕྱང་ཚུགས།		
༡.ཉ.༣ འཕྲུལ་ཐག་བཀལ་ཚུགས།		

༡.༤.༡ འཕྲུལ་གཟེར་གྱི་དབྱེ་བ་བཤད་ཚུགས།	༡.༤ འཕྲུལ་གཟེར་བསྒམ་ནི་དང་ཕྱེ་ནི།	
༡.༤.༢ འཕྲུལ་གཟེར་བསྒམ་སྟོངས་བཤད་ཚུགས།		
༡.༤.༣ *འཕྲུལ་གཟེར་བསྒམ་ནི་དང་ཕྱེ་བའི་སྐབས་ཚུལ་མཐུན་སྦྱེ་འབད་དགོ།*		
༡.༥.༡ ཆོམ་ཁང་རྒྱུན་སྐྱོང་འབད་དགོ་པའི་དགོས་པ་བཤད་ཚུགས།	༡.༥ ཆོམ་ཁང་རྒྱུན་སྐྱོང་ འབད་ནི།	
༡.༥.༢ མཐུན་ཉེན་ཉམས་བཅོས་དང་བསྒྲུར་གསོ་འབད་ཚུགས།		
༡.༥.༣ ཆོམ་ཁང་དང་མཐའ་འཁོར་གཙང་སྦྲ་བཞག་ཚུགས།		
༡.༥.༤ ཅ་ཆས་དང་རྒྱུ་ཆས་ཚུ་རང་སོའི་ས་སྒོ་ནང་བདེ་ཞིབ་རྒྱབ་སྐྱེ་བཞག་ཚུགས།		
༡.༥.༥ ཅ་ཆས་དང་རྒྱུ་ཆས་ཀྱི་རིགས་ཉེན་སྐྱང་དང་ལྡན་མེད་སྐྱེ་བཞག་དགོ།		
༡.༥.༦ ངོ་རྟགས་ཚང་ཚུ་ཚུལ་མཐུན་སྐྱེ་བཞག་དགོ།		
༡.༥.༧ སྒོ་བསྒམ་ནི་དང་ཕྱེ་ནི་དུས་ཚོད་གཏན་འཁེལ་བཟོ་དགོ།		
༡.༥.༨ འཕྲུལ་ཆོམ་ལག་ལེན་འཐབ་ཐོག་ལས་ཀྱོན་ཆས་བཅོམ་ནི་ལུ་གཡོག་ལུ་སྦྱོ་བ་ལེན་དགོ།		
སྟོན་ཚན་གསུམ་པ། ཁང་ཐགས་འཕྲུལ་ཐགས་དང་ དཀར་རྒྱང་དགྱི་ར་བཅོམ་ནི།		
༢.༡.༡ དགྱི་རའི་རྒྱུ་ཆ་དབྱེ་བ་ཕྱེ་ཚུགས།	༢.༡ རྒྱུ་ཆས་དང་ཅ་ཆས་ མཚོ་སྐྱབ་འབད་ནི།	
༢.༡.༢ སྐུད་པ་མཚོ་སྐྱབ་འབད་ཚུགས།		
༢.༡.༣ སྤུས་ཚད་དབྱེ་ཞིབ་འབད་ཚུགས།		
༢.༡.༤ ཐོན་རྩམ་སྒབ་སྐྱག་ངོས་འཛིན་འབད་ཚུགས།		
༢.༢.༡ ཚད་ལེན་གྱི་དགོས་པ་བཤད་ཚུགས།	༢.༢ དགྱི་ར་ཚད་ལེན་ནི།	
༢.༢.༢ འཛལ་ཐག་ལག་ལེན་འཐབ་ཐངས།		

३.१.३ ས་སྐྱུག་ལག་ལེན་འཐབ་ཐངས། ३.३.९ གཞི་རྟེན་རྩེས་ཐུ་བཤད་ཚུགས། 1. ཕབ་རྩི། 2. བགོ་རྩིས། 3. དགུ་འཐབ། 4. བསྟོམ་རྩིས། 5. བརྒྱ་ཆ་ཕབ་ཚུགས། ३.१.५ རྒྱ་ཚད་དང་རིང་ཚད་ལེན་ཚུགས། ३.१.६ ཚད་རྟགས་བཀལ་ཐངས་བཤད་ཚུགས། ३.१.७ འཛལ་ཐག་ ལག་ལེན་འཐབ་ཐངས། ३.१.८ འཁེལ་བ་དང་གོ་བརྡ་སྤྲོད་ཚུགས། ३.१.९० ཐེག་ཚད་ཐོབ་ཐངས་དང་འཁྲིལ་ལེན་དགོ། ३.१.११ རྒྱུ་ཆས་ཚད་འཛིན་སྤེ་ལག་ལེན་འཐབ་དགོ།		
३.३.१ དུམ་གྱི་སྐོར་ལས་བཤད་ཚུགས། ३.३.२ ཆོང་མགོན་པའི་དུམ་ཚད་ལངས་ཉིང་བལྟ་ཚུགས། ३.३.३ དུམ་ཚད་ཉིང་བལྟ་ཚུགས། ३.३.९ དུམ་ཚད་བལྟ་ཚུགས། ३.३.५ དུམ་གྱི་གྱངས་ཁ་བལྟ་ཚུགས། ३.९.६ *དུམ་མ་ལངས་པ་ཅིན་ ལངས་ཐབས་བཟོ་དགོ།*	**३.३ དཀྱི་ར་གི་དུམ་བཟོ་ནི། (འཕྲུལ་ཐག་ས)**	
३.९.१ ཁ་སྦྱིག་ཐངས་གལ་ཆེ་ཚུལ་བཤད་ཚུགས།	**३.९ དཀྱི་ར་གི་ཁ་སྦྱིག་ནི།**	

३.९.१ ཁ་མཀུ་མཛུག་བལྟ་ཚུགས།		
३.९.२ ཁ་སྒྲིག་ཐངས་ཀྱི་དབྱེ་བ་བཤད་ཚུགས།		
३.९.९ ཁ་ཐོབ་ཐངས་བལྟ་ཚུགས།		
३.९.५ ཁ་ཕྱི་ནང་གི་ཁྱད་པར་བལྟ་ཚུགས།		
३.९.६ ཁའི་ས་སྒོའི་སྟོམ་ཐངས་བཤད་ཚུགས།		
३.९.७ མ་བཅོམ་པའི་གོང་ལས་ཁ་ལྟ་རྟོག་འབད་དེ་ ཚོང་མཁོན་པ་དང་མཉམ་འབྲེལ་འབད་དགོ།		
३.५.१ མ་གི་གོ་དོན་བཤད་ཚུགས།	**३.५ དཀྱི་ར་མ་བཟོ་ནི།**	
३.५.२ མ་གི་དབྱེ་བ་དང་ཐོབ་ལམ་བཤད་ཚུགས།		
३.५.३ རྒྱ་ཚད་དང་རིང་ཚད་འཛལ་ཚུགས།		
३.६.१ འཛའ་ཐུ་ནིའི་གོ་རིམ་བཤད་ཚུགས།	**३.६ འཛའ་ཐུ་ནི།**	
३.६.२ འཛའ་ཚོས་གཞི་ཐོབ་ལམ་བཤད་ཚུགས།		
३.६.३ འཛའ་གི་ཚད་གཞི་ངོས་འཛིན་འབད་ཚུགས།		
३.६.९ དབུང་སྐྱི་རྒྱབ་སྐྱེ་འཛའ་བལྟབ་ཤུལ་བཟོ་ནི་དང་ཐིག་འཐེན་ཐངས།		
३.६.५ འཛའ་གི་ཕྱི་ནང་བལྟ་ཚུགས།		
३.६.६ འཛའ་མཐུད་ཐངས།		
३.६.७ **གྱིམ་ཅོ་ཡག་ལེན་འཐབ་ཐངས།**		
३.६.८ ཚོང་མཁོན་པའི་དགོས་མཁོ་དང་འཁྲིལ་འཛའ་ གི་ཚད་གཞི་གཏང་དགོ།		
३.६.९ འཛའ་ཐུ་བའི་སྐབས་ས་ཐུ་སྐྱེ་ཐུ་དགོ།		
३.७.१ སྐུད་པ་ཚོས་གཞི་སྒྲིག་དགོ་པའི་དགོས་པ་བཤད་ཚུགས།	**३.७ སྐུད་པ་ཚོས་གཞི་སྒྲིག་ནི།**	x

३.४.१ སྐྱེད་ཚོས་གཞི་དབྱེ་བ་ཕྱེ་སྟེ་ངོས་འཛིན་འབད་ཚུགས།		
३.४.३ སྐྱེད་ཚོས་གཞི་དང་འཁྲིལ་ཏེ་ལགཔ་ལེན་འཐབ་ཚུགས།		
३.४.९ སྐྱེད་གི་རྒྱུ་ཚས་ཚུ་ཚུལ་མཐུན་སྦེ་ལགཔ་ལེན་འཐབ་ཚུགས།		
३.५.१ འོག་སྐྱེད་དང་ལྡག་སྐྱེད་གཉིས་དམ་སྡོད་སྟེམ་ཚུགས།	**३.५ སྐྱེད་སྡུམ་སྡོད་བལྟ་ནི།**	
३.५.३ ཚེམ་རྒྱབ་པའི་སྐབས་སྐྱེད་གོང་འོག་གཉིས་དམ་ སྡོད་ཐུལ་ཐུལ་རང་དབྱེ་ཞིབ་འབད་དགོ།		
३.८.१ ལྷས་ཚེམ་གྱི་ཕྱི་ནང་དབྱེ་བ་ཕྱེ་ཚུགས།	**३.८ སོ་ཚེམ་/ལྷས་ཚེམ་རྒྱབ་ནི།**	
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३.८.१२ ལྷད་ཚེམ་རྒྱབ་པའི་སྐབས་ཕྱི་ནང་ཤེས་ཚུགས།		
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३.१०.२ གོམ་ཚད་ལགཔ་ལེན་འཐབ་ཚུགས།		

३.१०.३	གོམ་ཚད་ཀྱི་ཙང་རྟགས་བདེ་སྒྲིག་བཀལ་ཆུགས།	
३.१०.९	རྒྱུ་ཆས་དང་འཁྲིལ་བའི་ཆ་མཉེ་གོམ་ཚད་བདེ་སྒྲིག་འབད་ཆུགས།	
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1.	འཕྲལ་ཐགས།	
2.	པང་ཐགས།	
3.	ཀར་རྒྱང་།	
4.	མེ་ཏོག་ཅནམ།	
३.११.२	མ་མཐུད་རྒྱབ་དགོ་པའི་སྐོར་ལས་བཤད་ཆུགས།	
३.११.३	དུམ་(བྱང་ཐག)དབྱེ་བ་རེ་རེ་ལུ་མ་མ་འདྲཕ་བཟོ་ཐརས་ཀྱི་ སྐོར་ལས་བཤད་ཆུགས།	
३.११.९	ཆ་མཉང་ཐངས་སྐོར་བཤད་ཆུགས།	
३.११.५	ཚད་གཞི་སྟོམ་ཆུགས།	
३.१२.१	སོ་སྒྲིལ་རྒྱབ་དགོ་པའི་དགོས་པ་བཤད་ཆུགས།	**३.१२ དཀྱི་ར་ སོ་སྒྲིལ་རྒྱབ་ནི།**
३.१२.२	སོ་སྒྲིལ་རྒྱབ་ཐངས་ཀྱི་དབྱེ་བ་ཕྱེ་ཆུགས།	
३.१२.३	མ་གཏི་ཆོས་གཞི་དང་འཁྲིལ་ཏེ་སོ་སྒྲིལ་ཀྱི་སྐུད་པ་ཆོས་གཞི་ ལགཔ་ལེན་འཐབ་ཆུགས།	
३.१२.९	སོ་ཆུལ་མཐུན་སྒེ་སྒྲིལ་ཆུགས།	
३.१३.१	འཇའ་བཀལ་དགོ་པའི་དགོས་པ་བཤད་ཆུགས།	**३.१३ འཇའ་བཀལ་ནི།**
३.१३.२	འཇའ་གི་ཐོབ་ལམ་བཤད་ཆུགས།	
३.१३.३	འཇའ་དྲ་ནི་དང་བཅོམ་ནིའི་གོ་རིམ་བཤད་ཆུགས།	
३.१३.९	འཇའ་བཀལ་ནིའི་ཚད་གཞི་བཤད་ཆུགས།	
३.१३.५	འཇའ་གི་སྒྲིང་སྐྱོད་རན་ཏོག་ཏོ་སྒེ་བཀལ་ཆུགས།	

སྡོམ་ཚན་ཤས། མཇུག་བསྡུ་ནི།		
๔.๑.๑ དབྱར་སྨི་རྒྱབ་དགོ་པའི་དགོས་པ་བཤད་ཚུགས།	๔.๑ དབྱར་སྨི་རྒྱབ་ནི།	
๔.๑.๒ ལག་དེབ་ཀྱི་ཚོ་དོན་ལེན་ཏེ་དབྱར་སྨི་ལག་ལེན་འཐབ་ཚུགས།		
๔.๑.๓ དབྱར་སྨི་ལས་བཅེན་པའི་ཉེན་སྐྱང་ལག་ལེན་འཐབ་ཚུགས།		
๔.๒.๑ རྒྱམ་ཆ་བཏོན་དགོ་པའི་དགོས་པ་བཤད་ཚུགས།	๔.๒ རྒྱམ་ཆ་བཏོན་ནི།	
๔.๒.๒ སྐུད་པ་ངོ་བཏོགས་ཚུགས།		
๔.๓.๑ ལྷབ་དགོ་པའི་དགོས་པ་བཤད་ཚུགས།	๔.๓ བལྷབ་ནི།	
๔.๓.๒ དཀྱི་ར་བལྷབ་ཐངས་གི་སྐོར་ལས་བཤད་ཚུགས།		
1. གཉིས་ལྷབ།		
2. གསུམ་ལྷབ།		
3. བཞི་ལྷབ།		
4. ལྔ་ལྷབ།		
5. བརྒྱད་ལྷབ།		
๔.๔.๑ སྡོན་ཅིས་སྡོན་ཚུགས།	๔.๔ ཆོས་གླ་ལེན་ནི།	
1. ལས་མི་འཐུས།		
1. ཁང་འཐུས།		
2. མེ་ཁ་ལ།		
3. ཆུ་ཁ་ལ།		
๔.๔.๒ རྒྱུ་ཆས་དང་ཅ་ཆས་ཀྱི་རིན་ཚོང་དང་བདེན་ཀྱི་ཚོང་ཚད་རྒྱབ་ཚུགས།		
๔.๔.๓ གླ་འཐུས་བསྒྲུར་ཞིབ་འབད་ཚུགས།		
๔.๔.๔ ཐོ་བཀོད་འབད་ཚུགས།		
๔.๔.๕ བཅོམ་གླ་ལེན་ཐོག་འབྱོར་རྟགས་སྤྲོད་ལེན་དང་ འབྲེལ་བའི་ཁ་སྐབ་དགོ།		

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སྒོང་ཚན་༡༡། སྟོད་གོ་བཅེམ་ནི། **སྟོན་ཚན་དང་པ། སྟོད་གོ་ག་སྒྲིག་འབད་དེ་བཅོམ་ནི།**		XI
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৭.৪.৭ ཚོད་ལེན་གྱི་དགོས་པ་བཤད་ཚུགས། ৭.৪.৭ གཞི་རྟེན་རྩིས་ཁྲ་རྟུབ་ཚུགས། ৭.৪.৩ ཚོད་ལེན་ཤེས་ཡོན་བཤད་ཚུགས། 1. རྒྱ་ཚད་ལེན་ཐངས་བཤད་ཚུགས། 2. རིང་ཚད་ལེན་ཐངས་བཤད་ཚུགས། ৭.৪.৯ ཚད་རྟགས་བཀལ་ཐངས་བཤད་ཚུགས། ৭.৪.৫ ཐིག་ཚད་ཐོབ་ཐངས་དང་འཁྲིལ་ལེན་ཐངས་བཤད་ཚུགས།	৭.৪ **ཚོད་ལེན་ནི།**	
৭.৯.৭ གོང་གི་ཚད་གཞི་སྐོར་ལས་བཤད་པ་རྟུབ་ཚུགས། ৭.৯.৭ གོང་སྒྲིག་ཐངས་དང་དྲ་ཐངས་བཤད་ཚུགས། ৭.৯.৩ བལྟབ་སྟེ་དྲ་ཐངས་ཀྱི་སྐོར་ལས་བཤད་ཚུགས། ৭.৯.৯ གོང་གི་རྩ་སྒྲིག་ཐངས་ཀྱི་སྐོར་ལས་བཤད་ཚུགས།	৭.৯ **གོང་དྲ་ནི་དང་སྒྲིག་ནི།**	

๗.๔.๑ བཟོ་བཀོད་འབད་དགོ་པའི་དགོས་པ་ཤེས་ཚུགས། ๗.๔.๒ ཐིག་ཚད་འཐོབ་ཐངས་དང་འཁྲིལ་ཚད་ལེན་ཏེ་ དྲ་ཐངས་བཤད་ཚུགས། ๗.๔.๓ བཟོ་བཀོད་ཀྱི་ཁྲད་ཆོས་ཚུ་བཤད་ཚུགས། 1. ཚད་བཀལ་ཐངས། 2. དབྱིབས་བཟོ་ཐངས། 3. ཁ་སྣྱིག་ཐངས། 4. རྩ་ཐྲད་ཐངས། 5. ཆོས་གཞི་སྣྱིག་ཐངས། 6. སྤུས་ཚད་སྡུག་སྡུག་སྣྱིག་ཐངས། ๗.๔.๔ མ་དྲ་ཐངས་བཤད་ཚུགས། ๗.๔.๕ མ་གི་ཐོབ་ཐངས་བཤད་ཚུགས། ๗.๔.๖ བལྟབ་སྟེ་དྲ་ཐངས་བཤད་ཚུགས། ๗.๔.๗ མ་གི་རྩ་དང་ཁ་བལྟ་སྟེ་དྲ་ཐངས་བཤད་ཚུགས། ๗.๔.๘ མ་གི་རྩ་དང་ཁ་ལེགས་ཤོམ་སྟེ་སྣྱིག་སྟེ་དྲ་དགོ།	๗.๔ སྟོད་གོ་བཟོ་བཀོད་ འབད་དེ་མ་དྲ་ནི།	
๗.๕.๑ ཕྱུ་དུང་གི་ཚད་གཞི་དང་དབྱིབས་བཏོན་ཐངས་བཤད་ཚུགས། ๗.๕.๒ ཕྱུ་དུང་དང་ ཕྱུ་དུང་གི་ཁ་དྲ་ཐངས་ཀྱི་སྐོར་ལས་བཤད་ཚུགས། ๗.๕.๓ རྩ་ཕྲད་ཐངས་བཤད་ཚུགས། ๗.๕.๔ ཚད་དང་འཁྲིལ་ཏེ་དྲ་ཐངས་བཤད་ཚུགས། ๗.๕.๕ ཕྱི་ནང་དོས་འཛིན་འབད་ཐངས་བཤད་ཚུགས།	๗.๕ ཕྱུ་དུང་དང་ཕྱུ་དུང་གི་ ཁ་དྲ་ནི།	
๗.๖.๑ ཕྱོས་ཆོམ་རྐྱབ་དགོ་པའི་དགོས་པ་བཤད་ཚུགས། ๗.๖.๒ ཕྱོས་ཆོམ་རྐྱབ་ཐངས་ཀྱི་དབྱེ་བ་བཤད་ཚུགས།	๗.๖ ཕྱོས་ཆོམ་རྐྱབ་ནི།	

๑.๓.๓ མ་གི་ཚོས་གཞི་དང་འཁྲིལ་ཏེ་ལྷས་ཚེམ་གྱི་སྐུངས་ཚོས་གཞི་ལག་ལེན་འཐབ་དགོ། ๑.๓.๔ ལྷས་ཚེམ་ཚུལ་མཐུན་སྦྱི་ཀྱབ་དགོ།		
๑.๔.๑ སྟོད་གོས་ལྷས་ཚེམ་ཀྱབ་དགོ་པའི་དགོས་པ་དང་གོམ་ཚད་སྟོམ་ཐངས་སྐོར་ བཤད་ཚུགས། ๑.๔.๒ མཇུག་གི་ཚད་གཞི་སྟོམ་མཐུད་དང་མཇུག་བལྟབ་ཀྱབ་ཐངས་སྐོར་བཤད་ཚུགས། ๑.๔.๓ གོང་ཀྱབ་མདུན་དོས་འཛིན་འབད་དེ་གོང་བཀལ་ཐངས་བཤད་ཚུགས། ๑.๔.๔ ཕུ་དུང་ཁ་ཕྱི་ནང་སྒོག་དགོ་པའི་དགོས་པ་དང་ བཅེམ་ཐངས་ བཤད་ཚུགས།	**๑.๔ སྟོད་གོས་བཅེམ་ནི།**	
๑.๕.๑ གོང་བཀལ་དགོས་པ་བཤད་ཚུགས། ๑.๕.๒ གོང་བཀལ་ཐངས་བཤད་ཚུགས། ๑.๕.๓ མཇུག་བལྟབ་ཐངས་བཤད་ཚུགས། ๑.๕.๔ ཚེམ་ཕྲང་ཉིད་བཤད་ཚུགས། ๑.๕.๕ མཇུག་མཐུད་ཀྱབ་ཐངས་བཤད་ཚུགས། ๑.๕.๖ ཚད་གཞི་སྟོམ་ཐངས་བཤད་ཚུགས། ๑.๕.๗ གོང་ཀྱབ་མདུན་དཀྱེ་བ་དཔྱད་ཐངས་བཤད་ཚུགས།	**๑.๕ མཇུག་བལྟབ་བཅེམ་ནི་ དང་གོང་བཀལ་ནི།**	
๑.๑๐.๑ ཚད་གཞི་ལེན་ཐངས་བཤད་ཚུགས། ๑.๑๐.๒ ཁ་ཕྱི་འགྱུར་སྤེ་བཀལ་དགོ་པའི་དགོས་པ་བཤད་ཚུགས། ๑.๑๐.๓ ཕུ་དུང་གྱ་ཁ་མཐུད་ཐངས་བཤད་ཚུགས། ๑.๑๐.๔ མ་དང་ཕུ་དུང་མཐུད་ཐངས་བཤད་ཚུགས	**๑.๑๐ ཕུ་དུང་བཅེམ་ནི།**	

སྡོམ་ཚན་༢ཡ། ཤན་སྦྱངས་སྡོད་གོས་བཅོམ་ནི།		
༢.༡.༡ གོང་བཀལ་དགོ་པའི་དགོས་པ་བཤད་ཚུགས། ༢.༡.༢ གོང་བཟོ་བགོད་འབད་དེ་དྲ་ཐངས་བཤད་ཚུགས། ༢.༡.༣ གོང་བཅོམ་ཚུགས།	**༢.༡ གོང་དྲ་སྐྱེ་བཅོམ་ནི།**	
༢.༢.༡ ལག་ཆུན་བཟོ་བགོད་འབད་དེ་དྲ་ཐངས་བཤད་ཚུགས། ༢.༢.༣ ལག་ཆུན་བཅོམ་ཚུགས།	**༢.༢ ལག་ཆུན་དྲ་སྐྱེ་བཅོམ་ནི།**	
༢.༣.༡ ཚོད་ལེན་གྱི་དགོས་པ་བཤད་ཚུགས། ༢.༣.༢ ཚོད་ལེན་ཐངས་བཤད་ཚུགས། ༢.༣.༣ གཞི་རྟེན་རྩིས་ཁ་སྐྱོན་ཚུགས། ༢.༣.༤ མ་གཏི་དབྱེ་བ་ངོས་འཛིན་འབད་ཚུགས། ༢.༣.༥ ཤན་འཐད་སྡོད་གོས་ཚད་གཞི་སྒོར་བཤད་ཚུགས།	**༢.༣ ཤན་འཐད་སྡོད་གོས་ ཚད་ལེན་ཏེ་དྲ་ནི།**	
༢.༤.༡ མ་མཐུད་ཆུབ་དགོ་པའི་སྒོར་བཤད་ཚུགས། ༢.༤.༢ ཆོམ་ཐང་ཉིང་སྒོར་ཤེས་ཚུགས། ༢.༤.༣ ཚད་གཞི་སྟོམ་ཐངས་བཤད་ཚུགས།	**༢.༤ ཤན་འཐད་སྡོད་གོས་ བཅོམ་ནི།**	
སྒྲོང་ཚན་གཉིས་པ། སྡོད་གོ་ བཅོམ་ནི། **སྡོད་ཚན་༣ པ། འོན་འཇུ་ བཅོམ་ནི།**		XII
༣.༡.༡ འོན་འཇུའི་སྒོར་ལས་བཤད་ཚུགས། ༣.༡.༢ འོན་འཇུའི་ཆུ་ཆ་དང་ཅ་ཆས་ཀྱི་དབྱེ་བ་ཤེ་ཚུགས། ༣.༡.༣ འོན་འཇུ་གི་ཆ་ཤས་དང་ཚད་གཞི་སྒོར་བཤད་ཚུགས།	**༣.༡ འོན་འཇུ་ཆུ་ཆས་དང་ ཅ་ཆས་མཚོ་སྒྲུབ་འབད་ནི།**	

३.१.१ མ་གི་ཚད་ལེན་ཐངས་སྒོར་ལས་བཤད་ཚུགས། ३.१.२ གོང་གི་དགོས་པ་དང་ཚད་ལེན་ཏེ་དེ་ཐངས་སྒོར་ལས་བཤད་ཚུགས། ३.१.९ ཕུ་དུང་དང་ཕུ་དུང་ཁ་གི་ཚད་ལེན་ཐངས་སྒོར་བཤད་ཚུགས། ३.१.५ ཆོང་མཐོན་པའི་གཟུགས་ཚད་དང་། ཡང་ན། དཔེ་ཚད་ལས་ལེན་ཚུགས།	३.१ འོན་འཇུ་ཚད་ལེན་ཏེ་ བཟོ་བཀོད་འབད་དེ་ནི།	
३.३.१ འོན་འཇུ་གི་ཕུ་དུང་བཅོམ་ཐངས་སྒོར་བཤད་ཚུགས། ३.३.२ མ་གུ་ཕུ་དུང་སྦུགས་ཏེ་བཅོམ་ཐངས་བཤད་ཚུགས། ३.३.३ གོང་བཀལ་ཏེ་མོ་སྒྲིལ་རྒྱབ་ཐངས་བཤད་ཚུགས། ३.३.९ བརྡབ་ཆེམ་རྒྱབ་དགོ་པའི་ཁྲངས་བཤད་ཚུགས། ३.३.५ སྐུད་པ་ཆོས་གཞི་སྒྲིག་དགོ་པའི་དགོས་པ་ཤེས་ཚུགས། ३.३.६ བརྡབ་ཆེམ་རྒྱབ་ཐངས་མཐད་ཚུགས། ३.३.७ སྐུད་པ་ཆོས་གཞི་ངོས་འཛིན་དང་ལག་ལེན་ འཐབ་ཐངས་བཤད་ཚུགས། ३.३.८ ཕུ་དུང་མ་གུ་སྦུར་ཏེ་བརྡབ་ཆེམ་རྒྱབ་ཐངས་བཤད་ཚུགས། ३.३.९ འོན་འཇུ་མ་ མ་དྲ་བའི་ཉེ་མ་ཚད་བཀལ་ཐངས་ དཀྱིབས་བཟོ་ཐངས་ ཁ་སྒྲིགས་ཐངས་ རྩ་ཐྲད་ཐངས་ཚུ་ གི་ཁྲད་ཆོས་སེམས་ཁར་ཚང་དགོ།	३.३ འོན་འཇུ་བཅོམ་ནི་དང་ བརྡབ་ཆེམ་རྒྱབ་ནི།	
སྐོན་ཚན་.९ པ། པི་སི་སྐོད་དང་དཏྭལ་ཁྲག་བཅོམ་ནི། **(Pencil case/bag, Gents/Ladies Purse)**		
९.१.१ པི་སི་སྐོད་ཀྱི་ རྒྱུ་ཚའི་ངོས་འཛིན་སྒོར་ལས་བཤད་ཚུགས།	९.१ པི་སི་སྐོད་དང་དཏྭལ་ ཁྲག་བཟོ་ནི་གི་རྒྱུ་ཆ་མཁོ་སྤྲུབ་འབད་ནི།	

๔.๑.๑ བཟོ་བཀོད་འབད་དགོ་པའི་དགོས་པ་བཤད་ཚུགས། ๔.๑.๒ དགོས་མཁོ་དང་འཁྱིལ་བཟོ་བཀོད་འབད་དེ་དྲ་ཚུགས།	๔.๑ པི་སི་སྟོད་ཚད་ལེན་ བཟོ་བཀོད་འབད་དེ་དྲ་ནི།	
๔.๓.๑ སྒྲིལ་བཀལ་དགོ་པའི་དགོས་པ་དང་ སྒྲིལ་སྟེམ་ཏོག་ཏོ་འབད་བཀལ་ཐངས་བཤད་ཚུགས། ๔.๓.๒ ཤེབ་ཤེབ་བཙུགས་དགོ་པའི་དགོས་པ་དང་ ཤེབ་ཤེབ་བཙུགས་ཏེ་བཅོམ་ཐངས་བཤད་ཚུགས། ๔.๓.๓ མཐའམ་གཉིས་ཀྱི་སྒོ་རྒྱངམ་བཙུགས་ཏེ་ བཅོམ་ཐངས་བཤད་ཚུགས།	๔.๓ པི་སི་སྟོད་བཅོམ་ནི།	
๔.๔.๑ བཟོ་བཀོད་འབད་དགོ་པའི་ དགོས་པ་བཤད་ཚུགས། ๔.๔.๒ དགོས་མཁོ་དང་འཁྱིལ་བཟོ་དཀོད་འབད་དེ་དྲ་ཚུགས།	๔.๔ དངུལ་ཁུག་ཚད་ལེན་ བཟོ་བཀོད་འབད་དེ་དྲ་ནི།	
๔.๔.๑ སྒྲིལ་བཀལ་དགོ་པའི་དགོས་པ་དང་ སྒྲིལ་སྟེམ་ཏོག་ཏོ་འབད་བཀལ་ཐངས་བཤད་ཚུགས། ๔.๔.๒ ཤེབ་ཤེབ་བཙུགས་དགོ་པའི་དགོས་པ་དང་ ཤེབ་ཤེབ་བཙུགས་ཏེ་བཅོམ་ཐངས་བཤད་ཚུགས།	๔.๔ དངུལ་ཁུག་བཅོམ་ནི།	

ANNEXURE VIII: AUTOMOBILE

Instructional hours

Class	Modules	Chapter	Lessons	Nominal Duration (hrs)
IX	**Module I:** Servicing suspension system	**Chapter 1:** Practising Occupational Health and Safety (OHS), basic workshop practice and measuring instruments.	1. Apply Principle's of 5S 2. Apply OHS Practices 3. Use of Personal Protective Equipment (PPE) 4. Maintain workplace and personal safety 5. Maintain tools and equipment safety 6. Use fire extinguisher 7. Use hack saw 8. Perform filing 9. Perform drilling 10. Perform greasing 11. Perform grinding 12. Perform basic arc welding 13. Use multimeter 14. Use vernier calliper 15. Use micrometer	**23.5**
		Chapter 2: Replacing faulty rigid suspension components	1. Replace shock absorber 2. Replace leaf spring assembly 3. Disassemble leaf spring assembly 4. Assemble leaf spring assembly 5. Change leaf spring bush	**32**

		Chapter 3: Replacing faulty independent suspension components	1. Replace strut assembly 2. Disassemble strut and coil spring 3. Assemble strut and coil spring 4. Replace coil spring 5. Replace strut bar 6. Replace suspension arm 7. Replace torsion bar 8. Replace lateral control rod 9. Replace stabilizer bar	**44.5**
		Chapter 4: Diagnosing suspension system failures	1. Perform visual inspection of suspension failure 2. Perform bounce test 3. Perform test drive	**12**
	Engineering drawing	Draw basic signs, symbols, and dimension	1. Use drawing instrument 2. Lay out drawing sheet 3. Interpret engineering signs, symbols, and abbreviation 4. Draw different types of lines 5. Draw letters and numbers 6. Provide dimensions	**20**
			Total hours	**132**
X	**Module II:** Servicing brake system	**Chapter 1:** Overhauling brake system	1. Check operation of brake booster 2. Change brake booster 3. Replace master cylinder kit 4. Change brake shoes 5. Replace wheel cylinder kits 6. Change brake calliper assembly 7. Change brake pipeline 8. Change brake disc/rotor 9. Change brake fluid 10. Change load sensing device	**40.5**

			11. Change anti-lock brake system speed sensor 12. Change parking brake cable	
		Chapter 2: Adjusting brake system	1. Adjust brake pedal free play 2. Adjust drum brake 3. Adjust parking brake 4. Perform test drive	**8**
	Module: III Servicing steering system	**Chapter 1:** Servicing steering components	1. Replace steering wheels. 2. Replace steering Shaft 1. Replace tie rod end 2. Replace rack & pinion assembly 3. Replace pitman arm 4. Replace recirculating ball type steering gear box 5. Overhaul re-circulating type steering gear box 6. Adjust steering gear backlash 7. Replace integral power steering gear box	**53.5**
	Engineering drawing	Drawing isometric and orthographic projections	1. Convert drawing scales 2. Draw of isometric block 3. Draw orthographic projections	**30**
			Total hours	**132**
XI	**Module III:** Servicing steering system	**Chapter 1: (continued)** Servicing steering components	1.1. Replace rack & pinion power steering gear box 1.2. Replace power steering belt 1.3. Change power steering fluid 1.4. Purge hydraulic power steering 1.5. Replace power steering pump 1.6. Troubleshoot steering system	**26.5**

		Chapter 2: Servicing kingpin	1. Remove kingpin assembly 2. Refit kingpin assembly 3. Perform kingpin greasing 4. Replace steering knuckle	**18**
		Chapter 3: Performing wheel alignment	1. Perform pre-alignment 2. Adjust Toe-Angle 1. Adjust camber 2. Adjust caster angle	**12**
		Chapter 4: Carrying out wheel balancing	1. Perform inspection on tire wear 2. Perform static test drive 1. Perform dynamic test drive 1. Perform wheel balancing	**11**
	Module IV: Overhauling drive train	**Chapter 1:** Servicing propeller shaft components	1. Change propeller shaft 2. Check propeller shaft run out 3. Change cross bearing 4. Change center bearing 5. Troubleshoot propeller shaft	**1.**
		Chapter 2: Servicing final drive and differential components	1. Change transmission fluid 2. Replace transmission assembly 3. Disassemble transmission component 4. Inspect transmission components 5. Assemble transmission components 6. Adjust backlash or thrust play 7. Overhaul transfer case 8. Replace transaxle 9. Disassemble transaxle 10. Assemble transaxle 11. Troubleshoot transmission components	**90**
	Engineering drawing	Interpreting technical drawing	1. Draw isometric views for different joint 2. Interpret simple mechanical drawing	**20**

			3. Draw mechanical machine parts	
Total hours				**192**
XII	**Module IV:** Overhauling drive train	**Chapter 3:** Servicing wheel bearing and axle shaft components	1. Overhaul wheel hub assembly 2. Replace drive or axle shaft 3. Change CV joint 4. Troubleshoot wheel hub/drive/axle shaft	**17**
		Chapter 4: Servicing final drive and differential components	1. Change differential oil 2. Replace differential assembly 3. Disassemble differential assembly 4. Assemble differential assembly 5. Adjust tail pinion bearing preload 6. Adjust backlash 7. Troubleshoot final drive and differential components	**36**
		Chapter 5: Overhauling and service clutch mechanism	1. Replace clutch assembly 2. Inspect clutch components 3. Change clutch fluid 4. Replace clutch master cylinder 5. Replace clutch cable 6. Adjust clutch pedal free play 7. Troubleshoot clutch mechanism	**20**
	Module V: Servicing engine auxiliary system	**Chapter 1:** Servicing cooling system	1. Change Coolant 2. Change thermostat valve 3. Check leakages 4. Change Radiator Assembly 5. Change fan belt 6. Change Water Pump Assembly 7. Troubleshoot cooling system	**24**

		Chapter 2: Servicing lubrication system	1. Change Engine oil 2. Change oil pressure switch 3. Troubleshoot lubrication system	**9**
		Chapter 3: Servicing petrol fuel system	1. Change fuel filter 2. Service AC pump 3. Service carburetor 4. Check exhaust gas emission. 5. Change accelerator cable 6. Change fuel rail (fuel delivery pipe) and injector 7. Change positive crankcase ventilation (PCV) valve 8. Service fuel tank 9. Troubleshoot petrol fuel system	**27**
		Chapter 4: Servicing diesel fuel system	1. Change fuel filter 2. Change feed pump 3. Bleed fuel system 4. Set fuel injection timing (in-line type) 5. Service fuel injector 6. Set fuel injection timing (Distributor type 7. Troubleshoot diesel fuel system	**42**
	Module VI: Performing basic auto electrical works	**Chapter 1:** Inspecting/replacing basic electrical components	1. Perform soldering 2. Repair wires and connector 3. Change fuse	**8**
		Chapter 2: Servicing batteries and jump start vehicle	1. Change battery 2. Perform visual inspection 3. Check battery voltage 4. Perform jump starting 5. Change battery terminal	**9**

Total hours	**192**
Grand total hours	**648**

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Practise OHS procedures in any task for safety.
2. Follow the principles of 5S in daily life.
3. Use appropriate PPE as per the requirement.
4. Maintain hand tools and portable power tools for better performance.
5. Operate and use different fire extinguishers to combat different classes of fires at any time.
6. Use hacksaw safely wherever applicable.
7. Select tools as per the job requirement.
8. Identify and operate any type of drilling machine for any task.
9. Maintain equipment for effective and efficient performance.
10. Perform greasing as per the standard procedure.
11. Identify and operate any type of grinding machine as per the requirement.
12. Perform arc welding as per the job requirement.
13. Use multimeter as per the standard procedure.
14. Use Vernier calliper safely wherever applicable.
15. Use micrometer accurately wherever application.
16. Determine the defects and replace the shock absorber with bushes for any type of vehicle.
17. Determine the defects and replace the leaf spring in any type of vehicle and improve the vehicle's performance as per the standard procedures.
18. Determine the defects of leaf spring in any vehicle and disassemble the leaf spring per the standard procedure.
19. Disassemble and assemble any type of leaf spring as per the standard procedures.
20. Identify and replace any type of leaf spring bushes in any type of vehicle.
21. Identify the defects and replace any type of independent suspension system and defective strut in any vehicle.
22. Identify the jacking position in any vehicle.
23. Identify the defects and disassemble the strut assembly any time in a sequential array as per the requirement.

24. Disassemble/assemble the strut components and are installed in sequential order in any vehicle as per standard procedures.
25. Installed the Coil spring as per the standard procedures in any vehicle.
26. Replace the strut bar with strut rod bushing of any vehicle without damaging other components as per the standard procedures.
27. Replace the suspension arms without damaging other parts as per the standard procedures.
28. Align the torsion bar and adjust to the match mark as per the standard practices in any vehicle.
29. Replace the lateral control rod with specific torque as per the standard procedures in any vehicle.
30. Replace the stabilizer bar and bushes with specific torque applied as per the standard practices in any vehicle.
31. Determine the faulty components in any vehicle as per the standard procedures.
32. Perform the bounce test as per the standard procedure in any vehicle.
33. Identify the suspension failure symptoms through the test drive and recommendation is provided as per the job requirement.

2) CLASS X COMPETENCIES

1. Determine the faulty brake booster and brake booster operation is checked as per the standard procedure for all types of vehicles.
2. Installed brake booster components are securely and braking effectiveness is improved after changing brake booster for any vehicle.
3. Replace defective master cylinder kits as per the standard procedures for any vehicle.
4. Replace defective brake shoes per the service manual for any vehicle.
5. Replace damaged wheel cylinder kits and brake bleeding is performed as per the standard procedures for any vehicle.
6. Change defective brake calliper assembly as per the standard procedures and braking performance is effective for any automotive vehicle.
7. Change damaged brake pipe as per the standard procedures and brake system is operating effectively (improved) for any vehicle.
8. Replace rotor disc run out and thickness is inspected and changed as per standard practices for any vehicle.
9. Change contaminated or aged brake fluid and perform brake bleeding as per the standard procedures for any vehicle.
10. Replace load sensing device as per the standard procedure.
11. Replace defective ABS wheel sensor and sensor wire connector is connected as per the standard procedures for any vehicle.

12. Replace broken hand brake cable connections and adjust as per standard procedures for any vehicle.
13. Fit disconnected brake pedal and adjust brake free play to the specification as per the service manual for any vehicle.
14. Rectify ineffective drum brakes is adjusted to specification as per the service manual for any vehicle.
15. Identify the faulty brake system symptoms for any vehicle.
16. Replace steering wheel in the correct position as per the standard procedures for any vehicle.
17. Replace steering column without damaging other components and all electrical connections are connected as per the standard procedures for any type of vehicle.
18. Replace tie rod end as per the number of thread counted following standard procedures.
19. Replace the rack and pinion gear box without damaging other components following the service manual for any vehicle.
20. Align the pitman arm and sector shaft as per the alignment mark for any vehicle.
21. Replace the re- circulating ball type steering gear box as per the standard procedures for any vehicle.
22. Overhaul the recirculating ball steering system as per the service manual for any vehicle.
23. Adjust the steering gear backlash as per the manufacture specification depending upon different vehicles.
24. Replace integral power steering gear box as per the standard procedures for any vehicle.

3) CLASS XI COMPETENCIES

1. Replace the rack and pinion power steering gearbox as per the standard procedures for any vehicle.
2. Use the recommended power steering fluid as per the manufacturer's specification for all the vehicles.
3. Inspect the power steering drive belts as per the standard procedures.
4. Adjust the belt tension as per the service manual for any vehicle.
5. Refill the specific grade of power steering fluid as per the manufacturer’s specification for any vehicle
6. Change the power steering fluid as per standard procedures for any vehicle.
7. Carry out the purging of the hydraulic power steering system as per the job that requires following standard procedures.
8. Adjust the power steering drive belt tension and replace the power steering pump in the correct sequence as per the manufacturer’s specification for any vehicle.
9. Diagnose the faults or problems in the steering system as per the standard procedures for any vehicle.

10. Remove the wheel bearing and kingpin bearings using SST for any vehicle.
11. Adjust the kingpin bearing preload as per the given specification for any vehicle.
12. Perform the kingpin greasing as per the standard practices for any vehicle.
13. Mount and tighten the knuckle assembly to specific torque for any vehicle.
14. Identify the defects in suspension and steering components for any vehicle.
15. Measure the toe from the correct location and set as per the manufacturer's specification for any vehicle.
16. Adjust the camber angle by comparing the offset bolt graduation with manufacturer specifications for any vehicle.
17. Set the camber angle by tightening the offset/control arm bolt to the required torque.
18. Set the caster angle as per the standard procedures for any vehicle.
19. Identify tread wears as per the standard procedures for any vehicle.
20. Determine the imbalance wheel as per the standard procedures in any vehicle.
21. Determine the faults in the wheel as per the standard procedures for any vehicle.
22. Eliminate the problems related to unbalanced wheel and Wheel is balanced by adding counterweight(s) incorrect position for any vehicle.
23. Install a propeller shaft and eliminate the faults in any type of vehicle.
24. Identify run outs on the propeller shaft and measure by using a dial gauge as per the job requirement.
25. Eliminate faults regarding the drive shaft in any vehicle by replacing the cross-bearing as per the standard procedures.
26. Replace the centre bearing and tighten with specific torque as per standard procedures in any vehicle.
27. Identify the symptoms/failure of the propeller shaft as per the troubleshooting procedures in any vehicle.
28. Perform periodic maintenance of transmission components and a specified grade of transmission oil is used as per the manufacturer's specification for any vehicle.
29. Replace the transmission assembly without damaging other parts and power flow from the engine to the wheel is obtained as per the requirement.
30. Identify the defective components and dismantle as per the standard procedure for any vehicle when required.
31. Identify the defects of the transmission components and necessary recommendation 7s provided for any remedial action as per the requirement in any vehicle.
32. Assemble the transmission gearbox and adjust gear backlash/thrust play as per the standard procedure for any vehicle.

33. Eliminate the faults and assemble the transmission assembly of any vehicle with specific thrust play as per the manufacturer manual.
34. Overhaul and examine the defective transfer case components of any vehicle as per the standard procedures.
35. Determine the defects of the transaxle and is replaced as per the standard procedure for any vehicle.
36. Identify the defective parts of the transaxle through visual inspection and the components are dismantled sequentially as per the requirement in any vehicle.
37. Assemble the transaxle components sequentially as per the standard procedure in any vehicle.
38. Determine the problems with the manual transmission in any vehicle as per the job requirement.

4) Class XII COMPETENCIES

1. Eliminate the defects in the wheel hub as per the requirement.
2. Adjust the wheel bearing preload to the required torque as per the specification in the service manual book of a particular vehicle.
3. Replace the axle shaft in any vehicle without damaging axle shaft splines.
4. Determine the faults of CV joint and are replaced whenever required in any vehicle as per service manual.
5. Diagnose the faults and defects in the wheel hub as per the checklist.
6. Identify the possible faults of drive or axle shaft components through a road test and visual inspection in any vehicle.
7. Change the differential gear oil of specific grading as per the standard procedure at any time in any vehicle based on the service manual.
8. Determine the faults and replace differential assembly in any vehicle as per the job requirement.
9. Dismantle the differential assembly sequentially following the correct procedure and identified the defective parts through visual inspection as per the job requirement.
10. Disassemble the differential assembly to identify the defects and assemble as per the standard procedures at any time.
11. Apply the tail pinion bearing preload as per the requirement at any time for any vehicle.
12. Adjust the differential gear backlash as per the requirement at any time for any vehicle.
13. Determine the problem given by final drive or differential based on the symptom and recommended for repair as per the requirement in any vehicle.
14. Identify the defective clutch and replace the clutch assembly in the correct sequence as per the requirement in any vehicle.
15. Identify the symptoms and inspect the clutch components as per the standard procedure for any vehicle.

16. Refill the specific grade of clutch fluid as per the manufacturer's specification for any vehicle.
17. Install the clutch master cylinder kits in the correct order as per the requirement.
18. Replace the clutch cable as per the standard procedures for any vehicle.
19. Adjust the clutch pedal play as per the manufacturer's specification for any vehicle.
20. Diagnose faults in the clutch system as per the standard procedures for any vehicle.
21. Maintain the coolant ratio as per the manufacturer's specification for any vehicle.
22. Refill the coolant to specified cooling system capacity.
23. Conduct the radiator pressure testing as per the instructions specified in the performance guide for any vehicle.
24. Replace defective radiator without damaging radiator fins as per the service manual for any vehicle.
25. Replace thermostat valve as per the specification and as per the standard procedures.
26. Change defective fan belt and adjust as per the standard procedures/as per the service manual for any vehicle.
27. Change the water pump as per the manufacturer's specification for any vehicle.
28. Rectify the cooling system problem is done as per the manufacturer specification for any vehicle.
29. Replace contaminated engine oil with the correct specification for any vehicle.
30. Refill the engine oil to the specified level.
31. Ensure the engine oil pressure indicator on the dashboard is lit up when the ignition is at "ON" and goes off when the engine is started for any vehicle.
32. Change petrol fuel filter as per the standard procedures for any vehicle.
33. Change accelerator cable as per the standard procedures for any vehicle.
34. Change the fuel injector as per the standard procedure for any petrol engine vehicle.
35. Maintain the engine idle RPM for any vehicle.
36. Connect the PCV valve in the correct position as per the standard procedures for any vehicle.
37. Ensure the performance of the engine is improved while conducting test drive after being done with servicing fuel tank for all the vehicle.
38. Identify petrol fuel system faults as per the standard procedure of any vehicle.
39. Install the fuel filter as per the standard procedures/manufacturer's specification for any vehicle.
40. Change the feed pump as per the vehicle repair manual for any vehicle.
41. Perform the bleeding as per the standard procedure.
42. Ensure to deplete air from the diesel fuel system for all the vehicle.
43. Set fuel injection timing as per the standard procedures/ as per the service manual for any vehicle.
44. Spray the injector fuel at the correct pressure for any vehicle.

45. Maintain plunger stroke value as per the manufacturer's standards.
46. Set the fuel injection timing as per standard practices for any vehicle.
47. Diagnose the faults or problems in diesel fuel for any vehicle.
48. Carry out the troubleshooting as per service manual.
49. Perform soldering for the connection and electronic components in any vehicle as per the requirement.
50. Use the appropriate size and length of wires to avoid short circuits and open circuits daily.
51. Use any type of fuse as per the task provided.
52. Determine the defects of the battery and is replaced with correct polarity for any vehicle.
53. Improve the life span and safeguard the automotive batteries.
54. Measure the battery voltage as per the standard procedure for any vehicle.
55. Perform jump-starting to provide supplementary power to the dead battery for any vehicle as per the standard procedure.
56. Change battery terminal to the adequate flow of current from the battery to electrical components of automotive vehicles as per the manufacturer's specification.

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning objectives	Core concepts (Chapters/Topics)	Class
	MODULE I: **SERVICING SUSPENSION SYSTEM**	**IX**
	Chapter: 1 **Practising Occupational Health and Safety (OHS)**	
1. Define 5S 2. Sate the purposes of 5S 3. Explain the principle of 5S	**1. Apply principles of 5S**	
1. Define OHS 2. State the importance of OHS 3. Explain the rights for employee 4. State the main causes of accidents 5. State the safety rules 6. *Ensure appropriate use of PPE* 7. *Ensure to refer OHS manual*	**1. Apply OHS practice**	
1. Define PPE	**2. Use PPE**	

2. State the importance of PPE 3. List the categories of PPE *4. Ensure appropriate use of PPE* *5. Ensure safe disposal of damage PPE* *6. Ensure not to use defective and damaged PPE*		
1. Define safety precaution 2. List the different types of safety 3. Explain workshop and personal safety 4. State the importance of maintaining a workplace and personal safety 5. Explain the importance of safety signs and symbols 6. Explain the emergency exit 7. Describe the layout of the workshop *8. Ensure to follow OHS procedures* *9. Ensure to keep the workshop clean* *10. Ensure to ring the alarm bell before the accident spreads over* *11. Ensure to display safety signs and symbols* *12. Ensure to use appropriate PPE in workplace* *13. Ensure to avoid horseplay at workplace* *14. Ensure to avoid smoking and eating inside the workshop* *15. Ensure to avoid working under influence of alcohol*	**1. Maintain work place and personal safety**	
1. Explain tool and equipment safety 2. State the importance of maintaining tool and equipment safety 3. List the dos and don'ts for tool and equipment *4. Ensure all the tools are in workable condition* *5. Ensure to keep tools clean and dry, and tore them properly after use* *6. Ensure to operate the machine when instructed* *7. Ensure to refer manual prior to operation of tools and equipment*	**1. Maintain tools and equipment safety**	
1. Define fire extinguisher 2. Label the parts of fire extinguisher 3. State the types of fire	**2. Use fire extinguisher**	

4. List the types of fire extinguishers 5. State the method of combating/extinguishing fires *6. Ensure to read the instructions provided on the fire extinguisher* *7. Ensure appropriate use PPE*		
1. State function of hacksaw 2. List parts of hack saw 3. State types of hack saw *4. Ensure appropriate use of PPE*	**3. Use hacksaw**	
1. State the function of file 2. List the types of files 3. List the parts of file 4. *Ensure appropriate use PPE*	***4.*** **Perform filing**	
1. Define drilling machine 2. State the function of drilling machine 3. List the types of drilling machine *4.* ***Operate drilling machine*** *5.* ***Use center punch*** *6. Ensure appropriate use of PPE* *7. Ensure to use coolant*	**5. Perform drilling**	
1. State the function of grinding machine 2. Label the parts of grinding machine 3. List the types of grinding machine *4.* ***Operate grinding machine*** *5. Ensure appropriate use of PPE* *6. Ensure to keep safe distance between hand and grinding machine* *7. Ensure to use gradual force while grinding*	**6. Perform grinding**	
1. State the types of grease 2. Explain the purpose of greasing *3.* ***Use hand grease gun*** *4. Proper handling of tools and equipment* 5. *Ensure appropriate use of PPE*	**7. Perform greasing**	
1. Define of arc welding	**8. Perform arc welding**	

2. Define arc welding machine 3. List the types of welding machine 4. List the accessories and its functions 5. Define arc length *6.* ***Operate arc welding machine*** *7. Ensure appropriate use of PPE* *8. Ensure to set welding current as per the job requirement*		
1. State the function of multimeter 2. List the types of multimeter *3.* ***Set the multimeter*** *4. Ensure appropriate use of PPE*	**9. Use multimeter**	
1. Define vernier calliper 2. State the function of vernier calliper 3. List the types of vernier calliper 4. Label the parts of vernier calliper 5. Define and state the use of: 1. Vernier scale 2. Main scale 3. Least count 1. State the difference between inch and metric reading *2. Ensure appropriate handling of the vernier calliper*	**10. Use vernier calliper**	
1. Define micrometer 2. State the function of micrometer 3. Label the parts of micrometer 4. Explain the reading of micrometer 5. Define and state the uses of: 1. Main scale (sleeve scale) 2. Thimble scale 6. Write the difference between micrometer, dial gauge and vernier calliper 7. Explain the unit conversion *8. Ensure appropriate handling of micrometer*	**11. Use micrometer**	
Chapter: 2 Replacing faulty rigid suspension components		

1.1.1. Define suspension system 1.1.2. State the function of suspension system 1.1.3. Explain the operation of suspension system 1.1.4. State the types of suspension system 1.1.5. List the components of suspension system 1.1.6. State the functions of shock absorber 1.1.7. Classify the types of shock absorber 1.1.8. Illustrate the construction of shock absorber 1.1.9. Explain the operation of shock absorber 1.1.10. *Ensure the vehicle is parked safely* 1.1.11. *Ensure to place the safety stands on a designated area* 1.1.12. *Ensure to secure nuts and bolts of shock absorber* 1.1.13. *Ensure to handle tools and equipment properly*	**1.1. Replace shock absorber**	
2.4.1. Explain the types of leaf spring 2.4.2. State the functions of leaf spring 2.4.3. Explain the operation of leaf spring 2.4.4. Define and state the function of torque wrench 2.4.5. Explain the types of torque wrench 2.4.6. Explain the torque conversion factor *2.4.7.* ***Use hydraulic jack*** *2.4.8.* ***Use Torque wrench*** *2.4.9. Ensure vehicle is parked safely* *2.4.10. Ensure all tools and equipment are handled properly* *2.4.11. Ensure that chassis and axle is supported by safety stand*	**1.1. Replace leaf spring assembly**	
1. List the spring defects 2. Describe the materials of spring 3. Identify the components of leaf spring and its functions *4. Ensure appropriate use of PPE*	**1.2. Disassemble leaf spring assembly**	

5. Ensure proper usage of right tools to pry up the clamp		
1. Explain the importance of spring alignment 2. Define pneumatic impact gun 3. State the function of pneumatic impact gun 4. List the external components of pneumatic gun ***5. Use pneumatic impact gun*** *6. Ensure appropriate use of PPE* *7. Ensure leaf spring assembly is clamped on the vice securely*	**2.4 Assemble leaf spring assembly**	
1. Explain function of spring bush 1. State the types of bushes 2. *Ensure appropriate use of PPE* 3. *Ensure proper disposal of used bushes* 4. *Ensure to follow the cross pattern for loosening and tightening U-bolt*	**2. Change leaf spring bush**	
Chapter: 3 Replacing faulty independent suspension component		
2.7.1. Define independent suspension system 2.7.2. State function of strut assembly 2.7.3. List the types of independent suspension system 2.7.4. Explain construction of strut assembly 2.7.5. Explain operation of strut assembly *2.7.6. Ensure appropriate use of PPE* *2.7.7. Ensure brake lines are secured* *2.7.8. Ensure to tightened wheel nut with the specific torque*	**1. Replace strut assembly**	
1. Explain the components of independent suspension system 2. State the function of jack 3. List types of Jacks 4. Locate jacking position ***5. Use screw jack***	**2. Disassemble strut and coil spring**	

6. Use coil spring compressor *7. Ensure proper gripping of strut assembly in the bench vice* *8. Ensure the hooks of the spring compressors are place properly*		
1. State importance of coil spring positioning *2. Ensure to hold the piston rod safety while tightening the lock nut* *3. Ensure to install the spring in a correct position* *4. Endure to hock coil spring compressor correctly* *5. Ensure to tighten each coil spring compressor hook evenly*	**2. Assemble strut and coil spring**	
1. State function of coil spring 2. Explain the operation of coil spring *3. Ensure appropriate use of PPE* *4. Ensure to place the jack and safety stand in correct position*	**3. Replace coil spring**	
1. Describe strut bar 2. State the function of strut bar *3. Ensure to wedge wheels* *4. Ensure to give specified torque to strut bar nut*	**4. Replace strut bar**	
1. State the functions of suspension arm 2. Explain the types of suspension arm 3. Explain the operation of suspension arm *4. Ensure appropriate use of PPE* *5. Ensure to wedge the wheels*	**5. Replace suspension arm**	
1. Define torsion bar 2. State the function of torsion bar 3. Explain the characteristics of torsion bar 4. Explain the operation of the torsion bar. 5. Purpose of match mark. *1. Ensure appropriate use of PPE.*	**6. Replace torsion bar**	

2. *Ensure to wedge the wheels.* 3. *Ensure to place the jack and safety standing in the correct position.*		
1. Define lateral control rod 2. State the function of lateral control rod 3. Explain the operation of lateral control rod 4. *Ensure to wedge the wheels* 5. *Ensure the jack saddle is placed in the correct position* 6. *Ensure appropriate use of PPE*	**7. Replace lateral control rod**	
1. Define stabilizer bar 2. State the function of stabilizer bar 3. Explain the construction of stabilizer bar 4. Explain the operation of stabilizer bar 5. *Ensure to park the vehicle safely* 6. *Ensure appropriate use of PPE*	**8. Replace stabilizer bar**	
Chapter: Diagnosing suspension system failures		
1.1.1. List the methods of inspecting suspension system failure 1.1.2. Explain types of defects in suspension system 1.1.3. Explain the inspection checklist 1.1.4. *Ensure to use appropriate PPE* 1.1.5. *Ensure to park the vehicle safely*	**1. Perform visual inspection of suspension failure**	
1. Explain the methods of bounce test 2. *Ensure the vehicle is parked on the level ground*	**2. Perform bounce test**	
1. Explain the symptoms, causes and remedies of suspension system failure 2. *Ensure to fasten seat belt while driving* 3. *Ensure to follow traffic signs and road hazards*	**3. Perform test drive**	
MODULE II: SERVICING STEERING SYSTEM		**X**

Chapter: 1 Overhauling Brake System		
2.8.1. Define brake system 2.8.2. Explain the function of brake system 2.8.3. State the types of brake system 2.8.4. Explain the principle of brake system 2.8.5. Explain the components of brake system 2.8.6. State the function of brake booster 2.8.7. Explain the types of brake booster *2.8.8. Ensure to engage parking brake* *2.8.9. Ensure to engage gear in neutral* *2.8.10. Ensure to wedge the wheels*	**1. Check operation of brake booster**	
1. Illustrate the construction of hydraulic brake booster 2. Explain the operation of brake booster *3. Ensure appropriate use of PPE* *4. Ensure to handle brake fluid safely*	**2. Change brake booster**	
1. State the function of master cylinder 2. Explain the types of master cylinder 3. Illustrate the construction of master cylinder 4. Explain the operation of master cylinder *5. Ensure to dispose drained brake fluid in safe container* *6. Ensure safe handling of brake fluid* *7. Ensure to use gloves and goggles*	**3. Replace master cylinder kits**	
1. Explain the types of brake shoes 2. Explain the construction of drum brake 3. Explain the operation of drum brake *4. Ensure appropriate use of PPE* *5. Ensure to use safety stand and wedge the vehicle* *6. Ensure to place removed tire under the vehicle*	**4. Change brake shoes**	
1. Define wheel cylinder 2. State function of wheel cylinder 3. Explain the types of wheel cylinder	**5. Replace wheel cylinder kits**	

4. Illustrate the construction of wheel cylinder 5. Explain the operation of wheel cylinder *6. Ensure to wedge the wheels* *7. Ensure not to spill brake fluid over the vehicle body*		
1. Explain the types of brake calliper 2. Illustrate the construction of brake calliper 3. Explain the operation of brake calliper 4. State functions of brake pad and its wear indicator 5. Describe the materials of brake pad *6. Ensure safe handling of brake pipe while disconnecting* *7. Ensure safe handling of brake fluid* *8. Ensure appropriate use of PPE*	**6. Change brake calliper assembly**	
1. State the function of brake pipeline 2. Describe brake pipe layout 3. Explain the types of brake pipe ***4. Use flaring tool*** *5. Ensure to engage parking brake* *6. Ensure to handle brake safely* *7. Ensure appropriate use of PPE*	**7. Replace brake pipeline**	
1. State function of brake disc/rotor 2. State the types of brake disc/rotor 3. Explain the defects of brake disc/rotor ***4. Use micrometer*** *5. Ensure appropriate use of PPE* *6. Ensure to support the vehicle with safety stand*	**8. Change brake disc/rotor**	
1. State the purpose of changing brake fluid 2. State the function of brake fluid 3. Explain the types of brake fluid 4. List the properties of brake fluid 5. State the purpose of brake bleeding 6. Explain the changing intervals of brake fluid *7. Ensure appropriate use of PPE* *8. Ensure safe handling of brake fluid*	**9. Change brake fluid**	

1. Explain the function of load sensing device 2. Explain the construction and operation of load sensing device *3. Ensure appropriate use of PPE*	**10. Change load sensing device**	
1. Define ABS system 2. List the components of ABS 3. State the function of speed sensor 4. Explain the operation of ABS system *5. Ensure appropriate use of PPE* *6. Ensure that sensor wire is routed as previously to avoid crimping or twisting the wire harness.*	**11. Change anti-lock brake system speed sensor**	
1. State the function of hand brake cable 2. List the types of hand brake 3. Explain the operation of hand brake *4. Ensure proper disposal of old brake cable* *5. Ensure to use appropriate PPE*	**12. Change parking brake cable**	
Chapter: 2 Adjusting brake system		
1.1.1. Define pedal free play 1.1.2. State the importance of brake pedal free play 1.1.3. State the purpose of brake pedal free play 1.1.4. Define pedal height 1.1.5. State the purpose of pedal height 1.1.6. Define reserve distance 1.1.7. State the purpose of reserve distance *1.1.8. Ensure to engage parking brake* *1.1.9. Ensure appropriate use of PPE*	**2.9. Adjust brake pedal free play**	
Explain the types of drum brake adjuster List the purpose of brake adjustment *Ensure to wedge the wheels* *Ensure appropriate use of PPE*	**1.2. Adjust drum brake**	
2.3.1 State the purpose of parking brake adjustment	**1.3. Adjust parking brake cable.**	

1. List the symptoms, causes and remedies of brake failure 2. *Ensure to fasten seat belt* 3. *Ensure to maintain speed limit*	**1.4. Perform test drive**	
MODULE III: SERVICING STEERING SYSTEM		**X**
Chapter: 1. Servicing steering components		
2.5.1. Define steering system 2.5.2. State the functions of steering system 2.5.3. Explain the principles of steering system 2.5.4. Explain the types of steering system 2.5.5. Explain the components of steering system 2.5.6. List the types of steering gear box 2.5.7. Explain the basics of SRS system 2.5.8. State the advantages of SRS system 2.5.9. *Ensure to disconnect the battery negative terminal before removing steering wheel* 2.5.10. *Ensure to tighten wheel nut to specified torque* 2.5.11. *Ensure to use appropriate PP*	**2.10. Replace steering wheel**	
1. State the function of universal joint 2. State the function of steering column 3. Illustrate the construction of steering column *4. Ensure to take care of electrical components* *5. Ensure to use appropriate PPE*	**2. Replace steering shaft**	
1. State the function of tie rod end 2. Explain the construction of tie rod end *3. Ensure appropriate use of PPE* *4. Ensure proper disposal of waste*	**3. Replace tie rod end**	
1. State the function of rack and pinion 2. Explain steering gear mechanism 3. Calculate gear ratio 4. List the components of rack and pinion	**4. Replace rack and pinion assembly**	

5. Explain the operation of rack and pinion steering gear box *6.* ***Use tie rod end remover*** *7. Ensure to use appropriate PPE* *8. Ensure to jack up vehicle in correct position*		
1. State the functions of pitman arm *2. Ensure appropriate use of PPE* *3. Ensure to wedge the wheel*	**5. Replace pitman arm**	
1. Illustrate the construction of re-circulating type gear box 2. Explain the operation of recirculating gear box 3. Use of SST for removing pitman arm *4. Ensure to wedge the wheel* *5. Ensure to use appropriate PPE*	**6. Replace re-circulating ball type steering gear box**	
1. Ensuring that the gear oil is drained out without spilling and disposed in designated container	**7. Overhaul re-circulating type steering gear box**	
1. Define backlash 2. State the purpose of backlash ***3. Use dial gauge*** ***4.*** *Ensure dial gauge is handled safely* *5. Ensure to use appropriate PPE*	**8. Adjust steering gear backlash**	
1. Define power steering system **2.** State the types of power steering **3.** State the types of power steering gear box **4.** Explain the construction of integral power steering gear box **5.** Explain the operation of integral power steering gear box *1. Ensure proper disposal of used power steering fluid* *2. Ensure to use appropriate PPE*	**9. Replace integral power steering gear box**	
MODULE III: SERVICING STEERING SYSTEM		**XI**
1. State function of power steering system 2. Illustrate construction of hydraulic rack and pinion power steering system	**10. Replace rack and pinion power steering gear box**	

3. Explain the operation of hydraulic rack and pinion power steering system 4. Illustrate the construction of electronic power steering system 5. Explain the operation of electronic power steering system *1. Ensure steering fluid is disposed in a designated container*		
1. State the function of power steering drive belt 2. State the types of power steering drive belt 3. List the belt defects and its causes **1. *Use belt tension gauge*** 2. *Ensure proper handling to belt tension gauge*	**11. Replace power steering belt**	
1. State the function of power steering fluid 2. State the types of power steering fluid 3. List the properties of power steering fluid *1. Ensure old steering fluid is disposed in designated container*	**12. Change power steering fluid**	
1. State purpose of purging/bleeding hydraulic power steering **1.** *Ensure the fluid is not spilled*	**13. Purge hydraulic power steering**	
1. State the function of power steering pump **2.** Explain the types of steering pump **3.** Explain the construction of power steering pump **4.** Explain the operation of power steering pump *5. Ensure old steering fluid is disposed in a designated container*	**14. Replace power steering pump**	
1. Explain the symptoms, causes and remedies of steering system failure	**15. Troubleshoot steering system**	
Chapter: 2 Servicing kingpin		
2.1.1. Define kingpin 2.1.2. State the function of kingpin 2.1.3. Explain the construction of kingpin *2.1.4. Ensure proper handling of hand tools*	**1.1. Remove kingpin assembly**	

2.1.5. Ensure the vehicle is safely supported with safety stand *2.1.6. Ensure that the old grease is disposed at designated container*		
1. State the function of kingpin components 2. Explain kingpin inclination 3. Explain the causes and remedies of king pin failure 4. *Ensure proper handling of preload gauge*	**1.2. Refit kingpin assembly**	
1. Define grease 2. State the purpose of greasing 3. Explain the types of grease 4. State the properties of grease 5. *Ensure old grease is disposed at designated container*	**1.3. Perform kingpin greasing**	
1. Define steering knuckle assembly 2. State the function of knuckle assembly 3. Explain the function of knuckle oil seal *4. Ensure proper handling of hand tools*	**1.4. Replace knuckle assembly**	
Chapter: 3 Performing Wheel Alignment		
3.2.1. Define wheel alignment 3.2.2. Define steering geometry 3.2.3. State the factors affecting wheel alignment 3.2.4. List the specification of tire pressure 3.2.5. State importance of pre-alignment ***3.2.6. Use Tire pressure gauge*** *3.2.7. Ensure compressed air is used for the right application*	**1. Perform pre-alignment**	
1. Define toe angle 2. State the purpose of maintaining toe angle 3. Explain turning radius of toe angle 4. State the methods of adjusting toe-angle	**2. Adjust toe-angle**	

5. *Ensure the vehicle is wedged and engage parking brake securely* 6. *Ensure proper handling of SST (Steering wheel lock)*		
1. Define camber 2. State the purpose of camber 3. Determine the effects of camber failure 4. Explain steering axis inclination 5. *Ensure vehicle is parked on level ground* 6. *Ensure proper handling of hand tools and equipment*	**3. Adjust camber angle**	
1. Define caster 2. State the purpose of caster 3. Explain the effects of caster failure 4. *Ensure vehicle is parked on level ground* 5. *Ensure proper handling of hand tools and equipment*	**4. Adjust caster angle**	
Chapter: 4 Carrying out wheel balancing		
1. Define tire 2. State the function of tire 3. List the types of tires 4. Explain the construction of tire 5. List the defects of tire wear pattern 6. Explain the specification of tyre 7. Explain the symptoms and causes of tire wear 8. *Ensure that the vehicle is supported with safety stand in correct position*	**1. Perform inspection on tire wear**	
1. Define wheel balancing 2. State types of wheel balancing 3. Explain static wheel balancing. 4. State purpose of static test drive 5. *Ensure that the vehicle is jacked up at correct position*	**2. Perform static test drive**	

1. Explain the purpose of dynamic test 2. Explain dynamic balancing 3. State the purpose of dynamic test 4. List the types of pre-driving check 5. Explain the importance of pre-driving check *6. Ensure that all safety factors are followed while driving on the high way*	**3. Perform dynamic test drive**	
1. State the purpose of wheel balancing 2. State the purpose of counter weight 3. Explain the causes and effects of unbalanced wheel 4. Explain the proper handling of wheel balancing machine ***5. Operate wheel balancing machine*** *6. Ensure to check the machine prior to operation*	***4.* Perform wheel balancing**	
MODULE IV: OVERHAULING DRIVE TRAIN		
Chapter: 1 Servicing propeller shaft		
1. Define powertrain 2. State the components of powertrain 3. Explain the power flow mechanism in power train 4. Define propeller shaft 5. State function of propeller shaft 6. List types of propeller shaft 7. Explain purpose of slip joint 8. List components of propeller shaft and their functions 9. *Ensure to place saddle in correct position when lifting the vehicle*	***1.* Change propeller shaft**	
1. Explain purpose of checking propeller shaft run out 2. Explain function of counter weight on the propeller shaft *3. Ensure to use appropriate PPE*	**2. Check propeller shaft run out**	
1. State function of cross bearing	**3. Change cross bearing**	

2. List universal joint 3. List parts of cross bearing 1. *Ensure to use gloves*		
1. State function of centre bearing 2. Explain construction of centre bearing 1. *Ensure to use gloves*	**4. Change centre bearing**	
1.5.1 Explain the symptoms, causes and remedies of propeller shaft failure	**5. Troubleshoot propeller shaft failure**	
Chapter: 2 Servicing Final Drive and Differential Components		
2.9.1. State function of gear oil 2.9.2. List properties of gear oil 2.9.3. Explain classification and specification gear oil *2.9.4. Ensure to dispose used gear oil at designated container* *2.9.5. Ensure to use gloves*	**1. Change transmission oil**	
1. Define transmission system *2.* Explain functions of transmission system *3.* List types of transmission system *4.* List types of manual transmission *5.* ***Use transmission jack*** *6. Ensure to use gloves*	**2. Replace transmission**	
1. Illustrate construction of manual transmission *2.* Explain construction and operation of synchronising unit *3.* Explain power flow in transmission *4.* List types of gear used in manual transmission *5.* Explain calculation of gear ratio *6.* State functions of transmission components *7.* Type of bearing used in manual transmission *8.* Explain gear shifting mechanism	***3.* Disassemble transmission components**	

9. Use oil seal remover ***10. Use bearing puller*** ***11.*** *Ensure to use gloves*		
1.4.1. Illustrate the defects of transmission components 1.4.2. ***Use feeler gauge*** 1.4.3. *Ensure proper disposal of damaged gear*	***4.*** **Inspect transmission component**	
2.6.1 Ensure to use gloves	**5. Assemble manual transmission**	
1. State the purpose of transfer case 2. Illustrate the construction of transfer case 1. List types of transfer case 2. Explain the purpose of backlash/thrust play *3.* Explain operation of full-time and part-time transfer case *4. Ensure to use gloves* *5. Ensure to use appropriate hand tools*	**6. Overhaul transfer case**	
1. Define transaxle *2.* List types of transaxle *3. Ensure to use gloves*	***7.*** **Replace transaxle**	
1. Explain construction of transaxle 2. Explain power flow of transaxle 3. *Ensure proper disposal old transaxle fluid at designated container*	**8. Disassemble transaxle components**	
1. State functions of transaxle components *2.* State function of sealant *3.* Explain application of sealant *4. Ensure to use gloves* *5. Ensure proper disposal of old sealant*	**9. Assemble transaxle components**	
2.11.1 Explain symptoms, causes and remedies of transmission failure	**10. Troubleshoot transmission failure**	
MODULE V: OVERHAULING DRIVE TRAIN		**XII**

Chapter: 3 Servicing wheel bearing and axle shaft components		
1. State function of wheel bearing 2. List types of wheel bearing 3. Explain construction of wheel bearing assembly 4. Explain components of wheel hub assembly and their functions 5. Explain purpose of hub greasing 6. Explain purpose of bearing pre load *7.* ***Use of preload gauge*** *8. Ensure proper disposal of used grease* *9. Ensure to use gloves*	**1. Overhaul wheel hub assembly**	
1. State function of axle *2.* List types of axle *3.* Illustrate construction of drive axle *4.* List types of axle shaft *5.* State function of axle shaft *6.* Explain purpose of inspecting axle shaft *7. Ensure proper disposal of used lubricants* *8. Ensure to us gloves*	**2. Replace drive/axle shaft**	
1. State function of CV joint 2. List types of CV joint 3. Explain construction of CV joint 4. Explain operation of CV joint 5. *Ensure use of gloves*	**2. Change CV joint**	
6. Explain symptoms, causes and remedies of wheel bearing failure	**3. Troubleshoot wheel hub assembly**	
2.5.1 Explain symptoms causes and remedies of drive/axle shaft failure	**4. Troubleshoot drive/axle shaft**	
Chapter: 4 Servicing final drive and differential components		
1. Explain changing interval of differential oil	**1. Change differential oil**	

2. Explain specification of differential oil 3. State function of differential oil 4. Explain the classification of differential oil *5. Ensure to use gloves*		
1. Define final drive 2. Define differential 3. List types of differentials 4. State function of final drive 5. State function of differential 6. Explain application of differential *7. Ensure proper jacking position of vehicle* *8. Ensure to use gloves*	**2. Replace differential assembly**	
1. List types of final drive gear 2. Explain construction of differential 3. Explain working principle of differential 4. Explain differential gear ratio 5. State purpose of lock plates 6. State function of oil seal *7.* ***Use bearing puller*** *8. Ensure to use gloves*	**3. Disassemble differential assembly**	
1. Define bearing preload 2. State purpose of bearing preload 3. Define backlash 4. State purpose of backlash 5. Explain gear tooth nomenclatures and gear contact pattern *6.* ***Use SST (Differential side bearing adjuster)*** *7. Ensure to use gloves* *8. Ensure to take care of drained gear oil*	**4. Assemble differential assembly**	
4.5.1 Explain symptoms, causes and remedies of final drive/differential failure	**5. Troubleshoot final drive and differential**	

Chapter: 5 Overhauling and servicing clutch mechanism		
1. Define clutch system *2.* State function of clutch system *3.* Explain the classification of clutch system *4.* Illustrate construction clutch system *5.* Explain operation clutch system *6. Ensure to use gloves* *7. Ensure to dispose used clutch plate at designated place*	***1.* Replace clutch assembly**	
1. Explain functions of clutch plate, pressure plate, release bearing, pilot bearing, flywheel and release fork *2.* Illustrate parts of pressure plate *3.* List types of pressure plate *4.* Explain construction and function of clutch plate components *5.* List types of clutch plate 6. List the types of flywheel *7.* ***Use straight edge gauge*** *8. Ensure to use gloves*	***2.* Inspect clutch components**	
1. Explain the interval of changing clutch fluid *2. Ensure proper disposal of used clutch fluid* *3. Ensure to use gloves*	**3. Change clutch fluid**	
1. List components of clutch master cylinder *2.* State function clutch master cylinder *3.* Explain working principle of clutch master cylinder *4.* State function of slave cylinder *5.* List components of slave cylinder *6.* Explain the working principle of slave cylinder *7. Ensure to use gloves and goggles* *8. Ensure to dispose used clutch fluid and kits in safe place*	***4.* Replace clutch master cylinder kits**	

1. State function of clutch cable *2.* Explain operation of clutch cable *3. Ensure to dispose old clutch cable to designated place* *4. Ensure to use gloves*	***5.* Replace clutch cable**	
1. Explain the purpose of adjusting clutch pedal height *2.* Explain the specification of clutch pedal free play *3. Ensure to use gloves*	***6.* Adjust clutch pedal free play**	
1. Explain symptoms, cause and remedies of clutch failure	**7. Troubleshoot clutch system failure**	
MODULE VI: SERVICING ENGINE AUXILIARY SYSTEM		**XII**
Chapter: 1 Servicing cooling system		
1.1.1. Explain engine auxiliary system 1.1.2. State the function of cooling system 1.1.3. List the components of cooling system 1.1.4. Classify cooling system 1.1.5. Explain the operation of the cooling system. 1.1.6. Define coolant 1.1.7. State the function of coolant 1.1.8. List the properties of coolant 1.1.9. Explain water coolant ratio 1.1.10. State the importance of using distilled water 1.1.11. Explain the causes and effects of stray current 1.1.12. *Ensure proper disposal of used coolant*	**1. Change coolant**	
1. Explain the function of thermostat valve 2. List types of thermostat valve 3. Illustrate the construction of thermostat valve 4. Explain the operation of thermostat valve 5. *Ensure proper use of hand tools*	**2. Change thermostat valve**	
1. List types of leakages in cooling system	**3. Check cooling system leakages**	

2. Explain causes of cooling system leakage ***3. Use pressure tester*** *4. Ensure safe handling of pressure tester* 5. *Ensure that the vehicle is safely parked on level ground*		
1. State function of radiator 2. List types of radiator 3. Illustrate construction of radiator 4. State function of radiator cap 5. State function of fan shroud 6. Explain purpose of bleeding air from cooling system *7. Ensure to remove radiator when the engine is cool* *8. Ensure proper handling of radiator fins*	**4. Change radiator assembly**	
1. State functions of fan belt or drive belt 2. Classify drive belt or fan belt 3. Illustrate construction of fan belt 4. Explain the methods for adjusting the fan belt tension or drive belt 5. Explain the methods of checking fan belt tension 6. List the defects of belts 7. *Ensure safe handling of belt tension gauge*	**5. Change fan belt**	
1. State functions of water pump 2. State types of water pump 3. Illustrate the construction of water pump 4. Explain the working principle of water pump *5. Ensure proper disposal of used coolant and gasket* *6. Ensure to wear gloves*	**6. Change water pump assembly**	
1.7.1 Explain the symptoms, causes and remedies of cooling system failure	**7. Troubleshoot cooling system**	
Chapter: 2 Servicing Lubrication System		
1.1.1. Define lubrication system	**1. Change engine oil**	

1.1.2. State types of lubrication system 1.1.3. Classify methods of lubrication system 1.1.4. Explain construction of lubrication system 1.1.5. Explain operation of lubrication system 1.1.6. Define viscosity 1.1.7. State functions of engine oil 1.1.8. List properties of engine oil 1.1.9. Classify the specification of engine oil 1.1.10. Explain the changing interval of engine oil 1.1.11. State purpose of dipstick **1.1.12. *Use oil filter wrench*** 1.1.13. *Ensure to dispose the old engine oil and oil filter at the designated container* 1.1.14. *Ensure to wear gloves*		
1. State function oil pressure switch 2. Explain the operation of oil pressure switch	**2. Change oil pressure switch**	
6. Explain symptoms, causes and remedies of lubrication system failure	**3. Troubleshoot lubrication System**	
Chapter: 3 Servicing petrol fuel system		
1.1.1. Define fuel system 1.1.2. State types of fuel system 1.1.3. List the components of fuel system 1.1.4. State the function of fuel filter 1.1.5. Describe the construction of fuel filter 1.1.6. State the types of petrol fuel filter 1.1.7. Explain the changing interval of fuel filter 1.1.8. *Ensure to dispose old petrol fuel filter at the designated place* 1.1.9. *Ensure to wear gloves and goggles*	**1. Change petrol fuel filter**	
1. State the function of AC pump 2. Explain the construction the AC pump	**1.2. Service AC pump**	

3. Explain the operation of AC pump		
1. Define carburetor 2. State the function of the carburetor 3. State the types of carburetors 4. Explain the construction and working of carburetor fuel circuit 5. Ventura effects 6. Difference between the fixed venture and variable venture	**1.3. Service carburetor**	
1. Explain the emission control system 2. State the types of emission control system 3. Explain the exhaust emission and its effects on inhabitants 4. State the types of exhaust gas	**1.4. Check exhaust gas emission**	
1. State the function of accelerator cable 2. Explain the operating mechanism of acceleration system 3. *Ensure proper handling of hand tools*	**1.5. Change accelerator cable**	
1. Define of EFI system 2. Differentiate carburetor and EFI system 3. State advantages of EFI 4. State the sub-system of EFI system 5. State function of engine sensors 6. State function of fuel injector 7. List the types of fuel injector 8. Explain the construction of fuel injector 9. Explain the operation of fuel injector 10. *Ensure to gloves and goggles*	**1.6. Change fuel rail (fuel delivery pipe) and injector**	
1. State function of PCV valve 2. Illustrate the construction of PCV valve 3. Explain the operation of PCV valve	**1.7. Change positive crankcase ventilation (PCV) valve**	

1. State function of fuel tank 2. Illustrate the construction of fuel tank 3. *Ensure proper storing of ignitable substances* 4. *Ensure to wear gloves and goggles*	**1.8. Service fuel tank**	
3.9.1 Explain the symptoms, causes and remedies for carburettor fuel system failure	**1.9. Troubleshoot petrol fuel system**	
Chapter: 4 Servicing Diesel Fuel System		
1.1.1. Describe the diesel fuel system 1.1.2. State function of diesel fuel injection system 1.1.3. Illustrate the construction of diesel fuel injection system 1.1.4. Explain the operation of diesel fuel injection system 1.1.5. List the types of diesel fuel injection system 1.1.6. List the types of diesel fuel injection pump 1.1.7. State functions of diesel fuel filter 1.1.8. List the types of diesel fuel filter 1.1.9. Illustrate the construction of diesel fuel filter 1.1.10. Explain the changing intervals of diesel fuel filter 1.1.11. *Ensure to dispose old filter at the designated place* 1.1.12. *Ensure to wear gloves*	**1. Change diesel fuel filter**	
1. List the types of hand feed pump 2. Explain function of hand feed pump 3. Explain the operation of feed pump	**2. Change feed pump**	
1. State properties of diesel fuel 2. List the types of diesel fuel 3. State purpose of bleeding *4. Ensure to wear gloves and goggles*	**3. Bleed fuel system**	
1. Illustrate the construction of fuel injection pumps	**4. Set fuel injection timing (in-line type)**	

2. Explain the working principle of fuel injection pumps 3. Explain the working of centrifugal governor *4. Ensure appropriate use of PPE*		
1. Explain function of fuel injector 2. List the types of fuel injector 3. Illustrate the construction of fuel injector 4. Explain the operation of fuel injector 5. Explain the opening pressure of fuel injector ***6. Use fuel injector pressure tester*** *7. Ensure safe handling of fuel injector pressure tester* *8. Ensure to wear gloves and goggles*	**5. Service fuel injector**	
1. Illustrate the construction of distributor type fuel pump 2. Explain the operation of distributor type fuel pump 3. Describe the components of fuel injection pump 4. Explain the operation of all speed governor ***5. Use dial gauge*** *6. Ensure safe handling of dial gauge*	**2. Set fuel injection timing (Distributor type)**	
1. Explain the symptoms, causes and remedies for diesel fuel system failure 2. Explain the symptoms, causes and remedies for CRDI system failure	3. **Troubleshoot diesel fuel system**	
MODULE VI: PERFORMING BASIC AUTO ELECTRICAL WORKS		**XII**
Chapter: 1. Replacing basic electrical components		
1. Define soldering 2. List types of soldering lead and its size 3. State the purpose of soldering iron 4. Explain the purpose of flux during soldering ***5. Use soldering iron*** *6. Ensure to use gloves, goggles and apron*	**1. Perform soldering**	
1. Explain basic electricity	**2. Repair wires and connectors**	

2. List types of crimp terminal and connectors 3. List types of wire jointing 4. Illustrate colour coding and wire size *5. Ensure to use gloves* *6. Ensure to dispose wasted wires in proper place*		
1. State function of fuse 2. List types of fuse 3. Illustrate fuse rating and colour coding	**3. Change fuse**	
Chapter: 2 Servicing Batteries and Jump start vehicle		
1. Define battery and explain its function 2. Explain the purpose of disconnecting negative battery terminal 3. *Ensure to disconnect battery negative terminal prior to changing battery* 4. *Ensure to use gloves and apron*	**1. Change battery**	
3. Explain the construction of battery *1. Ensure to use hand gloves*	2. **Perform visual inspection**	
1. Describe the specification of battery ***3. Use multimeter*** *3. Ensure proper handling of multimeter/voltmeter*	**1. Check battery voltage**	
i) State the purpose of jump starting of battery ***i) Construct circuit of jump start*** ***i) Use battery starter*** *i) Ensure proper handling of battery starter* *5 Ensure to use gloves*	***2.* Perform jump starting**	
1. State the function of battery terminal 2. State the purpose of applying petroleum jelly 3. *Ensure to proper handling of battery end remover*	**1. Change battery terminal**	

Class-wise Competencies

1) CLASS IX COMPETENCIES

1. Carry out basic engineering drawings as per the requirement
2. Ensure proper handling of drawing instruments
3. Layout the drawing sheet as per the requirement
4. Interpret signs and symbols as per the requirement
5. Draw different types of line as per the application
6. Draw letters and numbers as per the given scale
7. Maintain dimension as per the standard

2) CLASS X COMPETENCIES

1. Convert the drawing scales as per the standard ratios
2. Draw isometric blocks and interpret any mechanical parts into 3D drawing as per the given dimension in standard procedures
3. Draw isometric views and orthographic projections as per the standard dimension

3) CLASS XI COMPETENCIES

1. Draw isometric views, orthographic projections, and mechanical machine part as the given dimension
2. Draw mechanical parts as per job requirements
3. Develop surface of any mechanical machine parts

Learning objectives, Core concepts (Chapters/Topics) and Process Essential Skills in table format

Learning objectives	Core concepts (Chapters/Topics)	Class
	Chapter 1: **Draw basic signs, symbols and dimension**	**IX**
1. Define engineering drawing 2. State the purposes of engineering drawing 3. List the types of drawing instruments 4. List sizes of drawing papers 5. Ensure to maintain cleanliness and neatness of drawing 6. Ensure proper handling of drawing instruments	**1. Use drawing instrument**	

1. Define layout of a drawing 2. Define the title block *3. Ensure to maintain cleanliness and neatness of drawing* *4. Ensure proper handling of drawing instruments*	*2.* **Layout drawing sheet**	
1. Define signs and symbols 2. Define abbreviation *3. Ensure to maintain cleanliness and neatness of drawing* *4. Ensure proper handling of drawing instruments*	*3.* **Interpret engineering sign, symbols and abbreviation**	
1. Define line 2. State types of line and its applications *3. Ensure to maintain cleanliness and neatness of drawing* 4. *Ensure proper handling of drawing instruments*	**4. Draw different types of lines**	
1. Define lettering and numbering 2. Classify letters style 3. List the types of letters 4. Define freehand lettering 5. List the size of letters 6. State the rules for lettering and numbering *7. Ensure to maintain cleanliness and neatness of drawing* *8. Ensure proper handling of drawing instruments*	**5. Draw letters and numbers**	
1. Define dimension 2. State the types of dimensions 3. Explain the system of dimensions 4. State the terminologies of dimensions 5. State the rules for dimensioning *6. Ensure to maintain cleanliness and neatness of drawing* 7. *Ensure proper handling of drawing instruments*	**6. Provide dimensions**	
Chapter 2: Drawing isometric and orthographic projections		**X**
1. Define drawing scale	**1. Convert drawing scale**	

2. List the types of scale *3. Ensure to maintain cleanliness and neatness of drawing* *4. Ensure proper handling of drawing instruments*		
1. Define isometric drawing 2. State the isometric terminologies *3. Ensure to maintain cleanliness and neatness of drawing* *4. Ensure proper handling of drawing instruments.*	**2. Draw isometric blocks**	
1. Define orthographic projections 2. Draw six principle views 3. Explain the method of obtaining six principle views 4. Explain four quadrants with the help of diagrams 5. Differentiate between first and third angle projections *6. Ensure to maintain cleanliness and neatness of drawing* *7. Ensure proper handling of drawing instruments*	**3. Draw orthographic projections**	
Chapter 3: Interpreting technical drawing		**XI**
1. Describe sectional views 2. State the purpose of sectional views 3. State the rules of sectioning 4. Describe auxiliary views 5. List the types of auxiliary views 6. State the purpose of auxiliary view *7. Ensure to maintain cleanliness and neatness of drawing* *8. Ensure proper handling of drawing instruments*	**1. Draw sectional views for different joint**	
1. Define mechanical drawing 2. List types of mechanical drawing 3. Explain plan, elevation, and section *4. Ensure to maintain cleanliness and neatness of drawing* *5. Ensure proper handling of drawing instruments*	**2. Interpret simple mechanical drawing**	
1. Development of surfaces	**3. Draw development of surface**	

2. State the methods of surface development 3. Explain the principle of surface development *4. Ensure to maintain cleanliness and neatness of drawing* *5. Ensure proper handling of drawing instruments*		

ANNEXURE IX: COMPUTER HARDWARE AND NETWORKING

Instructional hours

Class	Module	Topic/Chapter	Lessons	Nominal duration (Hrs)
IX	**MODULE 1:** Performing installation and configuration of computer system and device	**Chapter 1:** Practising Occupational Health and Safety (OHS) and workshop safety	1. Apply principles of 5S 2. Use Personal Protective Equipment (PPE) 3. Maintain workplace and personal safety 4. Maintain tools and equipment safety 5. Use fire extinguisher	12
		Chapter 2: Performing PC Assembly	1. Fix motherboard 2. Mount Central Processing Unit (CPU) 3. Mount CPU fan 4. Fix Random Access Memory (RAM) 5. Install Add-on cards 6. Install Hard Disk Drive (HDD) 7. Install optical drive 8. Install Switch Mode Power Supply (SMPS) 9. Configure the front panel connection 10. Conduct test for PC assembly	71
		Chapter 3: Performing data backup	3.1 Perform cloud-based backup 3.2 Perform off-site back-up 3.3 Perform network- attached storage back-up	49
Total Hours				**132**

Class	Module	Topics/Chapter	Lessons	Nominal duration (Hrs)
X	**MODULE 1:** Performing installation and configuration of computer system and device	**Chapter 4:** Installing Operating System (OS) and Application software	4.1 Install Windows Operating System (OS) 1. Install Mac OS 2. Install Linux OS 3. Install application software 4. Install device driver 5. Format Hard Disk Drive (HDD) 6. Customize disk partition (through Disk management)	101
		Chapter 5: Installing peripheral device	1. Install printer 2. Install projector 3. Install scanner	31
			Total Hours	**132**

Class	Module	Topics/ Chapter	Lessons	Nominal duration (Hrs)
	MODULE 2: Performing troubleshooting of computer system and devices	**Chapter 1:** Diagnosing faults of computer system and device	1. Attend customer complaint 2. Test software compatibility 3. Check software update 4. Perform system scan 5. Defragment Hard Disk Drive (HDD) 6. Perform continuity test 7. Diagnose boot error 8. Diagnose frequent auto restart 9. Diagnose Blue Screen of Death (BSOD)	**127**

XI			10. Check screen error 11. Perform troubleshooting with inbuilt tools 12. Check cable resistance 13. Test hardware compatibility 14. Check network adapter	
		Chapter 2: Rectifying software faults	1. Install software update 2. Repair software 3. Upgrade software 4. Rectify Blue Screen of Death (BSOD) error 5. Repair operating System (OS)	**41**
		Chapter 3: Rectifying PC components faults	1. Service cooling mechanism 2. Service Switched Mode Power Supply (SMPS)	**25**
	Total Hours			**192**

Class	Module	Topics/ Chapter	Lessons	Nominal duration (Hrs)
	MODULE 2: Performing troubleshooting of computer system and devices	**Chapter 3:** Rectifying PC components faults	3. Replace laptop screen 4. Replace mother board 5. Replace laptop speaker 6. Replace laptop keyboard 7. Replace laptop touch pad	**28**
		Chapter 4: Rectifying peripheral device faults	1. Service printer 2. Service photocopy machine 1. Service scanner	**27**
	MODULE 3: Carrying out installation and	**Chapter 1:** Preparing for network installation	1. Conduct site survey 2. Design network topology 3. Prepare Ethernet cable	**42**

XII	configuration of network	**Chapter 2:** Installing network	1. Perform PVC casing and capping 2. Fix input/output (I/O) box 3. Perform fiber optics spicing 4. Install firewall devices 5. Install cisco router. 6. Install network switch 7. Install Wi-Fi router.	**48**
		Chapter 3: Configuring network	1. Configure cisco router 2. Configure Wi-fi router 3. Configure network switch 4. Configure computer on network 5. Configure network security software 6. Document network details.	**47**
			Total Hours	**192**
			Total	**648**

Class-wise Competencies

1. CLASS IX COMPETENCIES

1. Practice OHS procedures in any task for safety
2. Practice OHS procedures for safety
3. Make appropriate use of PPE
4. Practice OHS procedures in any task for safety
5. Maintain workplace safety in day-to-day life
6. Practice OHS procedures in any task for safety
7. Maintain hand tools and portable power tools for better performance
8. Practice OHS procedures in any task for safety
9. Use different types of fire extinguishers to combat the fire
10. Prepare for effective data backup and recovery when required to identify a secure storage device to store important documents for future use

11. Backup data when required to format the system or storing important documents for future use
12. Install Window OS (Window 7/10) actual/Simulated workplace while performing tasks
13. Install device drivers when device malfunction or device drivers missing
14. Install Application software when application software is corrupted or upgrading
15. Configure software when PC is formatted or OS is upgraded
16. Identify tools, materials, and equipment for computer maintenance when repairing or performing computer maintenance and networking
17. Fix Motherboard when motherboard fails to work
18. Mount CPU when CPU malfunctions or upgrading
19. Mount CPU fan when the system gives a heat-related error
20. Fix RAM when a new system requires replacement of the RAM or when there is no display on the screen
21. Install Add-on card when integrated ports fail to work or upgrading

2. CLASS X COMPETENCIES

1. Install HDD when HDD fails to work or upgrading the drive capacity
2. Install Optical drive when optical drive malfunctions or while upgrading
3. Format Hard Disk Drive (HDD) when Pre-installed OS is affected by malware or upgrade OS
4. Install SMPS when SMPS malfunction or upgrading
5. Configure front panel connection when assembling PC
6. Conduct test for PC assembly when devices are malfunctioned or not detected
7. Download device driver using software when devices are malfunction or device driver is missing
8. Install printer when the printer driver is missing or printer is newly installed
9. Install scanner when documents need to be scanned
10. Install projector during the projection of slides or film
11. Install barcode reader when barcode driver is missing/corrupt
12. Check software update popup notification for the update, as and when required for a security update
13. Perform system scan when the computer is affected by the virus
14. Diagnose boot error when window fails to boot

3. CLASS XI COMPETENCIES

1. Check hardware compatibility when setting up new system or upgrading Operating System
2. Check software compatibility when installing a new OS in the system or upgrading the Operating System
3. Check screen to diagnose and fix common screen errors
4. Check system component voltage when the system restarts frequently, gets heated up, and/or loses power abruptly
5. Troubleshoot using windows inbuilt tools to solve system issues
6. Estimate the cost of repair to determine the cost, quantity, specification, and time required for the
7. maintenance and installation of computer hardware or network
8. Install software update when computer slows down or software malfunction
9. Repair software when application software malfunctions
10. Upgrade software when a software compatibility issue occurs and new features are introduced
11. Rectify BSOD error when the blue screen appears
12. Repair operating system when operating system files is/are corrupted and/or missing and displays error messages
13. Repair SMPS when computer malfunction due to power supply-related issues
14. Replace screen when the screen has display error due to hardware failure
15. Replace speakers when there is no audio output or need to enhance audio
16. Replace keyboard when keyboard cannot be repaired by simple hardware and software troubleshooting
17. Replace touchpad when there is touchpad sensor errors/damage

4. CLASS XII COMPETENCIES

1. Service cooling medium when the system restarts frequently, BSOD errors occur and internal components are damaged due to overheating
2. Troubleshoot computer system and devices (PC faults and software faults) of any computer
3. Service printer when the paper gets frequently jammed
4. Service photocopy machine when periodic maintenance is done as per the operational manual of the machine
5. Service scanner when scanned documents are not clear or dark
6. Design network topology when client demands or faulty network topology needs to be replaced

7. Estimate the cost when there is demand/request for providing service
8. Lay network cable when setting up a new network or replacing existing cables
9. Install switch when a new network is set up or replacing a faulty switch
10. Install firewall device when the network requires security
11. Fix I/O box when new network setup or additional nodes required
12. Carry out casing capping when a new network is set up or during the major maintenance of an existing network
13. Configure modem router (Wireless Router) when setting up new modem router and/or replacing a faulty router
14. Configure a computer on the network when installing a new network
15. Assign IP address when setting up the network
16. Configure switch when a new network is set up
17. Configure network security software when installing a new network
18. Document network details when a network is established
19. Check a network device driver when the network device is not functioning
20. Test cable continuity while new UTP cable is prepared or the cable is repaired
21. Ping IP address when devices fail to respond
22. Check data transmission when setting up a new network or inspecting the data rate of the existing network
23. Check signal strength when the performance of the network is not stable
24. Test device port when ports are damaged and/or non-functional
25. Prepare maintenance plan when setting up a new network and additional software and hardware is added to the network system
26. Backup Network data when solving network issues and before upgrading server
27. Upgrade network operating software when upgrade popup message is displayed or when the existing software becomes obsolete
28. Rectify signal (WiFi) strength when an internet connection is weak/fluctuates
29. Reset modem router when an administrator password is forgotten and WiFi performance is poor

Learning Objectives, Core concepts (Chapters/Topics) and Process Essential Skills

Learning Objectives	Core concepts (Chapters/Topics)	Class
	MODULE 1: Performing installation and configuration of computer system and device	
	Chapter 1: Practising Occupational Health and Safety (OHS)	**IX**
3.1.1. Define 5S 3.1.2. State the purposes of 5S 3.1.3. Explain the principles of 5S 3.1.4. Define OHS 3.1.5. State the importance of OHS 3.1.6. Explain the rights of employee 3.1.7. State the main causes of accidents 3.1.8. State the safety rules *3.1.9. Ensure appropriate use of PPE* *3.1.10. Ensure to refer OHS manual*	**1.1. Apply principles of 5S**	
1.2.1. Define PPE 1.2.2. State the importance of PPE 1.2.3. List the categories of PPE 1.2.4. *Ensure appropriate use of PPE* 1.2.5. *Ensure safe disposal of damage PPE* 1.2.6. *Ensure not to use defective and damaged PPE*	**1.2. Use Personal Protective Equipment (PPE)**	
1. Define safety precaution 2. List the different types of safety 3. Explain workshop and personal safety 4. State the importance of maintaining a workplace and personal safety 5. Explain the importance of safety signs and symbols 6. Explain the emergency exit 7. Describe the layout of the workshop	**1.3. Maintain workplace and personal safety**	

8. *Ensure to follow OHS procedures* 9. *Ensure to keep the workshop clean* 10. *Ensure to ring the alarm bell before the accident spreads over* 11. *Ensure to display safety sings and symbols* 12. *Ensure to use appropriate PPE in workplace* 13. *Ensure to avoid horseplay at workplace* 14. *Ensure to avoid smoking and eating inside the workshop* 15. *Ensure to avoid working under influence of alcohol*		
1. Explain tool and equipment safety 2. State the importance of maintaining tool and equipment safety 3. List the dos and don'ts for tool and equipment 4. *Ensure all the tools are in workable condition* 5. *Ensure to keep tools clean and dry, and tore them properly after use* 6. *Ensure to operate the machine when instructed* 7. *Ensure to refer manual prior to operation of tools and equipment*	**1.4. Maintain tools and equipment safety**	
1. Define fire extinguisher 2. Label the parts of fire extinguisher 3. State the types of fire 4. List the types of fire extinguishers 5. State the method of combating/extinguishing fires 6. *Ensure to read the instructions provided on the fire extinguisher* 7. *Ensure appropriate use PPE*	**1.5. Use fire extinguisher**	
Chapter 2: Performing PC Assembly		
2.1.1. Define the motherboard 2.1.2. Label components of the motherboard	**2.1 Fix motherboard**	

2.1.3. Classify types of motherboards 2.1.4. Label system case 2.1.5. List types of the system case 2.1.6. State functions of stand-off 2.1.7. **Interpret manual** 2.1.8. **Align motherboard** 2.1.9. *Have works ethics and integrity* 2.1.10. *Be time conscious* 2.1.11. *Be efficient in using resource* 2.1.12. *Have patience* 2.1.13. *Proper handling of tools and storage of tools and materials* 2.1.14. *Ensure to avoid dropping the screws on motherboard to prevent short circuits* 2.1.15. *Ensure to use anti-static wristband while fixing the motherboard* 2.1.16. *Ensure safe handling of tools, materials and Motherboard*		
1. Define CPU 2. Explain CPU frequency 3. Categorise types of CPU 4. Interpret CPU alignment 5. List types of sockets 6. Describe the effect of binding pins 7. **Align CPU on socket** 8. *Ensure to align CPU on the socket after interpreting identification marks* 9. *Ensure to use anti-static wrist band* 10. *Ensure to switch off the power supply* 11. *Ensure to maintain Zero Insertion force (ZIF)while fixing CPU*	**3.2. Mount Central Processing Unit (CPU)**	
3.3.1. Define CPU fan 3.3.2. Explain purpose of locking CPU fan 3.3.3. Explain computer cooling mechanisms and its function	**7.3. Mount CPU fan**	

3.3.4. Identify the ports and to connect CPU fan 3.3.5. State the concept of e-waste management 3.3.6. *Ensure CPU fan is properly aligned and tightened* 3.3.7. *Ensure proper handling of CPU fan and tools* 3.3.8. *Ensure power supply is unplugged*		
2.4.1. Define RAM 2.4.2. State the function of RAM 2.4.3. Classify types and size of RAM 2.4.4. **Identify the RAM** 2.4.5. Ensure RAM is seated firmly 2.4.6. *Ensure retaining clips are properly locked* 2.4.7. *Ensure compatible RAM is installed according to requirements* 2.4.8. *Ensure handle RAM lock with care* 2.4.9. *Ensure to use anti-static wrist band*	**2.4. Fix Random Access Memory (RAM)**	
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ANNEXURE X: Contributors for the development of the framework-Provisional Edition

Advisors

1. Dasho Karma Tshering, Secretary, Ministry of Education, Thimphu
2. Kinga Dakpa, Director General, REC, Paro
3. Norbu Wangchuk, Director, DTE, MoLHR, Thimphu

Language Editor:

1. Amber Rai, REC, Paro

Researchers and writers

1. Karma Dorji, Sr. Programme Officer, TPSD, MoLHR, Thimphu
2. Wangchuk, Dy. Chief Programme Officer, TPSD, MoLHR, Thimphu
3. Kinga Dorji. TTI, Samthang
4. Kinley Namgyal, Specialist, REC, Paro

Layout Designer

1. Tashi Zangpo, REC, Paro

ANNEXURE XI: Contributors for the development of the framework-First Edition

Advisors

1. Dasho Karma Tshering, Secretary, Ministry of Education, Thimphu
2. Tashi Namgay, Director, DCPD, MoE, Thimphu
3. Norbu Wangchuk, Director, DTE, MoLHR, Thimphu

Language Editor:

1. Amber Rai, DCPD, Thimphu

Researchers and writers

1. Leki Dorji, TTI, Thimphu
2. Kinga Dorji. TTI, Samthang
3. Kinley Namgyal, Specialist, DCPD, MoE

Layout Designer

1. Tashi Zangpo, DCPD, MoE, Thimphu

TRASHI DELEK