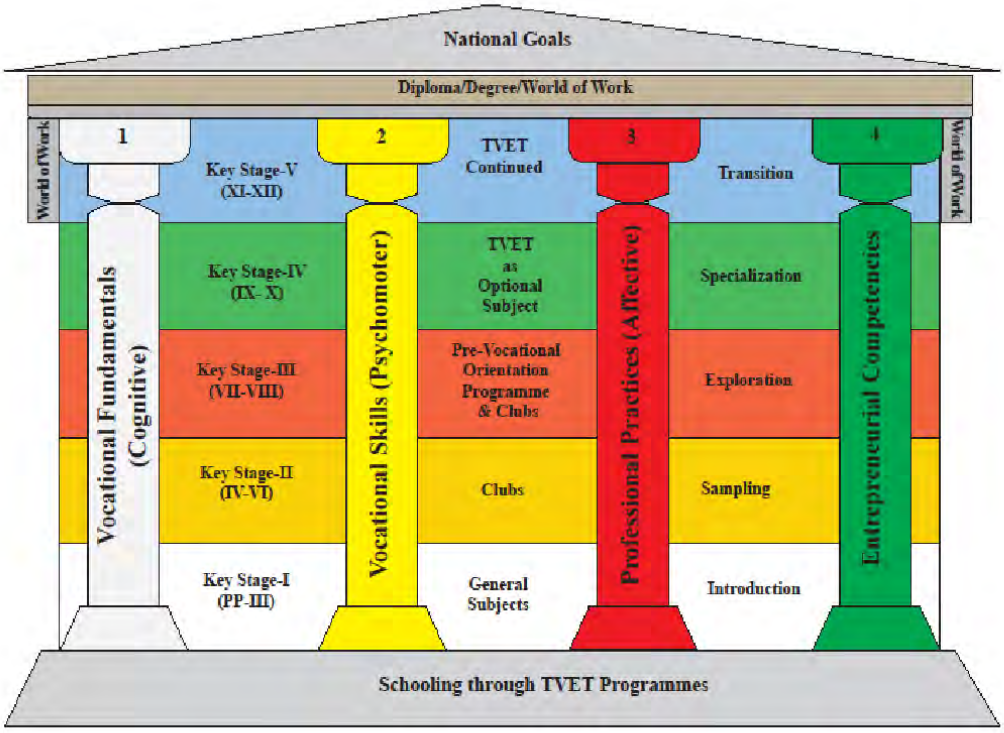
TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)

NEW NORMAL CURRICULUM

INSTRUCTIONAL GUIDE

(FURNITURE MAKING)

CLASS: X



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Tel: +975-8-271226
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Advisors

i. Kinga Dakpa, Director General, Royal Education Council, Paro
ii. Wangpo Tenzin, Dean, Curriculum Specialist, REC, Paro

Researchers and writers

i. Thinley Choden, Assistant Instructor, Rangjung HSS, Trashigang.
ii. Kinley Namgyal, Specialist, REC, Paro.

Layout Designer
Tashi Zangpo, REC, Paro

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FOREWORD

COVID-19 has suddenly caused unforgiving disruptions in the public education all over the world, and brought about threats of fragmentation due to disparities in accessibility and connectivity in many systems. In Bhutan too, continuity of education and learning has been severely affected as a result of nationwide school closures and due to restrictions and health protocols. The disruptions have led to challenges in many existing patterns and trends in education resulting in a massive shift away from learning and teaching in traditional settings with physical interactions to the maximum in terms of relevancy and efficiency. This has caused a major problem for children living in poverty worldwide, who often rely on the physical settings of their schools for educational materials, guidance, and, sometimes, the only decent meal of the day.

In the new normal education, human interaction and well-being is a priority. Technology, particularly digital technology that enables communication, collaboration and learning across distance, is a formidable tool – not a panacea but a source of innovation and expanded potentials. As we embrace this exceptional opportunity to transform the world, and as we reimagine the organization of our educational institutions and learning environments, we will need to think about where we want to go.

In the post COVID 19 era, we must prioritize the development of the whole person not just academic knowledge. Inspiration for the change can be drawn from the 1996 Delors report, *Learning the treasure within*, in its specification of four pillars of learning as "learning to know", "to do", "to be", and "to live together". Therefore, curricula must be increasingly perceived as an integrated and based on themes and problems that allows learners to learn to live in peace with our common humanity and our common planet. This has the potential in the development of a strong base of knowledge about one's self and about the world and find purpose and be better able to participate in social and political milieu.

The New Normal Curriculum is, not just a mere response to the pandemic, but also a culmination of the curriculum reform work for the last four years by the Royal Education Council. It is an attempt to transform education from the teaching of "what" to learning of "how" and "why" towards empowering learners with the transversal competencies and the 21st century skills and preparing them to be lifelong learners. We are optimistic that this move orients our education process towards nurturing nationally rooted and globally competent citizens.

Wish all our learners and teachers a life-enriching experiential teaching and learning.

Kinga Dakpa,

Director-General

INTRODUCTION

Technical and Vocational Education and Training (TVET) is education and training which provides knowledge and skills for employment. It comprises of education, training and skills development related to a wide range of occupational fields, production, services and livelihood. The Royal Education Council and Ministry of Education envisage 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) 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) under the Ministry of Education 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 '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 the erstwhile Department of Curriculum Research and Development under Ministry of Education, Vocational Curriculum has been introduced in the schools with 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 upscaling and diversification of TVET in schools through the provision of alternative pathways in schools and 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 emphasized 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 programs collaboratively.

Although the TVET curriculum is competency-based with more emphasis on hands-on experience, further improvements have been made taking care of cognitive and affective domains besides psychomotor. Teaching and learning approaches have also been enriched with the recommendation to use ICT and online resources. Since the pandemic (COVID-19) has resulted in the closure of schools, it has taught us lessons to be prepared for such an untoward situation in the future. Thus, the New Normal Curriculum Instructional Guide is prepared not only to encourage blended learning but also to facilitate remote learning. Thus, the guide would help the schools to implement the curriculum effectively without limiting to contact teaching/learning besides using a variety of pedagogies.

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MODULE 1: Performing manual work

Chapter 3: Carrying out basic woodwork

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives	Core concepts (Chapters/Topics)
3.7.1 Define glass. 3.7.2 State the function of a glass cutter. 3.7.3 State the types of glasses. 3.7.4 Cut glass.	**3.7 cutting glass**

B. Competencies:

- ✓ Cut glass as per the job requirement (desired shapes and sizes).

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 3.7
  - ✓ The teacher explains the types of glasses.
  - ✓ Make the students perform operation sheet 3.7.
  - ✓ Teacher to demonstrate cutting glass, followed by guided practice and individual practice.

- **Non-contact:**
  - ✓ Make learners watch the video from the given link on the process of cutting glass and let them take notes. https://www.youtube.com/watch?v=hIWfvgDJ3JE
  - ✓ Make learners take notes on different types of glasses from textbooks and any other resources available.

Assessment:

- **Contact:**
  - ✓ The teacher assesses learners' understanding by asking questions.
  - ✓ Assess their assigned task using a rubric.

✓ **Non-contact:**

- ✓ Assess learners based on work submitted in the Google Classroom.
- ✓ Learners to answer the question after watching the video from the given link
- ✓ Share the weblink https://www.youtube.com/watch?v=hIWfvgDJ3JE.

➢ **Resources (online and offline):**

- ✓ CBLM
- ✓ https://www.youtube.com/watch?v=hIWfvgDJ3JE (Process of cutting glass)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives		Core concepts (Chapters/Topics)
3.8.1	Define wood.	**3.8 Perform Timber seasoning**
3.8.2	Classify the types of wood.	
3.8.3	State the characteristics of wood.	
3.8.4	Explain the species of trees in Bhutan.	
3.8.5	State the properties of wood.	
3.8.6	Explain the cross-section of timber.	
3.8.7	Explain the conversion of timber.	
3.8.8	Explain preservation of timber.	
3.8.9	Explain the timber defects.	
3.8.10	Define timber seasoning.	
3.8.11	Explain the purpose of seasoning.	
3.8.12	State the types of seasoning.	
3.8.13	Explain the methods of seasoning.	
3.8.14	Explain the moisture content in timber.	
3.8.15	Perform timber seasoning	

B. Competencies:

- ✓ Perform timber seasoning for making any product.

C. Pedagogy/Learning Experiences

- ✓ **Contact**:
  - ✓ Make the students read information sheet 3.8
  - ✓ Make the students perform operation sheet 3.8
  - ✓ Leaners to practice air seasoning guided by the teacher.
  - ✓ Leaners to go around their places to find at least three different species of wood.
  - ✓ Leaners to be in groups to do a presentation on given topics by a teacher.

- ✓ **Non-contact:**
  - ✓ Make learners go through the outer parts of a tree in the given link https://www.abcteach.com/documents/clip-art-tree-parts-color-i-abcteachcom-34022
  - ✓ Make learners explore the character of timber and write each to submit through google classroom.
  - ✓ Make learners explore the importance of timber seasoning.
  - ✓ Leaners to go through the given links showing the cross-section of wood. Explore and write the functions of each part of wood given in the link. https://www.pinterest.com/pin/116741815320865017/

- ✓ Given links shows the methods of timber seasoning https://www.youtube.com/watch?v=veD-xtLdDpU. After watching the video, differentiate between natural and artificial seasoning.
- ✓ Make learners identify the tress (at least three different species) around their place and identify whether it is soft or hardwood.
- ✓ Make learners explore defects of timber and write notes.

D. Assessment:

- ✓ **Contact:**
  - ✓ Assess their assigned task (different species of tree in and around their places)
  - ✓ Assess learner's understanding by asking questions/ conducting tests.
  - ✓ Assess learners through their presentation using the rubric.
- ✓ **Non-contact:**
  - ✓ Assess the learners based on work submitted in the Google Classroom on the following content:
    - o Defect of timber
    - o Cross-section of wood
    - o Species of wood
    - o Differences between natural and artificial seasoning.

E. Resources (online and offline):

- ✓ CBLM
- ✓ https://www.youtube.com/watch?v=veD-xtLdDpU (Methods of seasoning)
- ✓ https://www.pinterest.com/pin/116741815320865017/ (Cross-section of wood)
- ✓ https://www.abcteach.com/documents/clip-art-tree-parts-color-i-abcteachcom-34022 (Outer parts of trees)

Chapter 4: Performing wood joints

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives		Core concepts (Chapters/Topics)
4.1.1	Define wood joints.	**4.1 Making butt joints**
4.1.2	Explain the purpose of a butt joint.	
4.1.3	State the application of butt joint.	
4.1.4	State the requirements of a wood joint.	
4.1.5	Explain the types of a butt joint.	
4.1.6	Make butt joint.	

B. Competencies:

- ✓ Use butt joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.1
  - ✓ Make the students perform operation sheet 4.1

- **Non-contact:**
  - ✓ Make learners record a short video of making butt joints and submit it through google classroom or any social media.
  - ✓ Make students state the application of butt joints around their place.
  - ✓ Make learners solve sample self-check 4.1.

D. **Assessment:**

- **Contact:**
  - ✓ The teacher may assess their butt joints using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess the learner based on work submitted in the Google Classroom (short videos and sample self-check 4.1)

E. **Resources (online and offline):**

- ✓ CBLM

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives		Core concepts (Chapters/Topics)
4.2.1	Define half-lap joint.	**4.2 Making half-lap joints**
4.2.2	State the purpose of a half-lap joint.	
4.2.3	State the types of half-lap joints.	
4.2.4	Make half lap joint	

B. Competencies:

- ✓ Use a half-lap joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.2
  - ✓ Make the students perform operation sheet 4.2
  - ✓ A teacher explains the marking before making half-lap joints.

- **Non-contact:**
  - ✓ Make learners go through the given links on making half-lap joint https://www.instructables.com/Easy-Half-Lap-Joints/
  - ✓ Learners make simple half-lap joints by using tools available at their place and let them explain what they learned while making half-lap joints.

- ✓ Let learners list the products where half-lap joints is being used at their place.

D. **Assessment:**

- **Contact:**
  - ✓ Teacher to assess their half-lap joints using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess learner based on work submitted in the Google Classroom (half-lap joints made by them)
  - ✓ Assess learners through their work submitted on the questions assigned.

E. Resources (online and offline):

- ✓ CBLM
- ✓ https://www.instructables.com/Easy-Half-Lap-Joints/(Process of making half-lap joint)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives	Core concepts (Chapters/Topics)
4.3.1 Define "T" joint. 4.3.2 Explain the application of the "T" joint. 4.3.3 Explain the types of "T" joints. 4.3.4 Perform "T" Joint	**4.3 Perform T joints**

B. Competencies:

- ✓ Use T joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.3
  - ✓ Make the students perform operation sheet 4.3

- **Non-contact:**
  - ✓ Make learners go through the given links on making T bridle joint https://www.youtube.com/watch?v=PJvlr2xgBnI
  - ✓ Make learners list down the applications of T joints.
  - ✓ Make leaners make T joints.

D. Assessment:

- **Contact:**
  - ✓ A teacher may assess their T joints using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess the learners based on responses submitted in Google.

E. Resources (online and offline):

- ✓ CBLM
- ✓ https://www.youtube.com/watch?v=PJvlr2xgBnI(Process of making T bridle joint)

A. **Learning objectives/ Broad theme / Strand/Chapter/topic:**

Learning objectives	**Core concepts (Chapters/Topics)**
4.4.1 Define mortise and tenon joint. 4.4.2 State the application of mortise and tenon joint. 4.4.3 State the types of mortise and tenon joint. 4.4.4 Perform mortise and tenon joint.	**4.4 Performing mortise and tenon joint**

B. Competencies:

- ✓ Use mortise and tenon joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.4
  - ✓ Make the students perform operation sheet 4.4
  - ✓ The teacher explains the types of mortise and tenon joint.

- **Non-contact:**
  - ✓ Make learners go through the given links on making mortise and tenon jointhttps://www.youtube.com/watch?v=KOEYimvaQz4
  - ✓ Make leaners do audio records on what they understood from mortise and tenon joint by watching video from a given link.

D. Assessment:

- **Contact:**
  - ✓ The teacher assesses their mortise and tenon joint using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess the learners based on work submitted in the Google Classroom (audio record on mortise and tenon joints) using a rubric.

D. Resources (online and offline):

- ✓ CBLM

- ✓ https://www.youtube.com/watch?v=KOEYimvaQz4(Process of making mortise and tenon joint)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives	Core concepts (Chapters/Topics)
4.5.1 Define miter joint. 4.5.2 State the applications of the miter joint. 4.5.3 Explain the types of the miter joint. 4.5.4 Explain the characteristics of the miter joint. 4.5.5 Make miter joint.	**4.5 Making miter joint.**

B. Competencies:

- ✓ Use miter joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.5
  - ✓ Make the students perform operation sheet 4.5
  - ✓ Demonstrate marking while making miter joint

- **Non-contact:**
  - ✓ Make learners explore the types of miter joints and submit the works in google classroom.
  - ✓ Make learners list the applications of miter joints.
  - ✓ Make learners solve **SAMPLE SELF CHECK 4.5.**

D. **Assessment:**

- **Contact:**
  - ✓ Teachers assess their miter joint using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess learners based on work submitted in the Google Classroom (Application of miter joints and types of miter joints) using a rubric.

E. Resources (online and offline):

- ✓ CBLM

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives	Core concepts (Chapters/Topics)
4.6.1 Define finger joint. 4.6.2 List the types of finger joints.	**4.6 Making finger joint.**

4.6.3 State the application of finger joint. 4.6.4 Make finger joint.	

B. Competencies:

- ✓ Use a finger joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.6
  - ✓ Make the students perform operation sheet 4.6

- **Non-contact:**
  - ✓ Make learners go through the given link to learn more on finger joints, go to slide 8 of 13 in the given link https://www.slideshare.net/rmaliberan07/types-of-wood-joint and make notes on finger joints.
  - ✓ Write applications of finger joints in and around your place.

D. Assessment:

- **Contact:**
  - ✓ Teachers assess their finger joints using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess learners based on work submitted in the Google Classroom (Application of finger joints) using a rubric.

B. Resources (online and offline):

- ✓ CBLM
- ✓ https://www.slideshare.net/rmaliberan07/types-of-wood-joint (Notes/slide on joints)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives	Core concepts (Chapters/Topics)
4.7.1 Define dovetail joint. 4.7.2 Explain the characteristics of the dovetail joint. 4.7.3 List the types of a dovetail joint. 4.7.4 List the application of the dovetail joint. 4.7.5 Perform dovetail joint.	**4.7 Performing dovetail joints.**

B. Competencies:

- ✓ Use a dovetail joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:

- ✓ Make the students read information sheet 4.7
- ✓ Make the students perform operation sheet 4.7

- **Non-contact:**
  - ✓ Make learners go through the given links where all the content of dovetail joints is being mentioned https://www.dcdrawers.com/blog/what-is-a-dovetail-joint-types/#dovetail
  - ✓ Make leaners go take notes on dovetail joints and let them differentiate between half-blind and through dovetail joints and submit through google classroom.
  - ✓ Make leaners list any products where dovetail joints are common.

D. Assessment:

- **Contact:**
  - ✓ A teacher may assess their task (Dovetail joints) using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess learners based on work submitted in the Google Classroom (differences between half-blind and through dovetail joints) using a rubric.

E. Resources (online and offline):

- ✓ CBLM
- ✓ https://www.dcdrawers.com/blog/what-is-a-dovetail-joint-types/#dovetail (Details on dovetail joints)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives	Core concepts (Chapters/Topics)
4.8.1 Define sash joint. 4.8.2 Explain the purpose of the sash joint. 4.8.3 State the characteristics of sash joints. 4.8.4 State the application of sash joint. 4.8.5 Perform sash joint.	**4.8 Performing sash joints.**

B. Competencies:

- ✓ Use sash joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.8
  - ✓ Make the students perform operation sheet 4.8
  - ✓ Teacher to invite guest lecturer to explain and demonstrate sash joints.
  - ✓ Leaners make sash joints.

- **Non-contact:**

- ✓ Make learners go through the given link showing the process of making sash joint, and explore the different tools and machinery used in the video https://woodandshop.com/the-house-jointer-make-sash-windows/
- ✓ The teacher provides notes on applications and characteristics of sash joint to be noted by learners.

D. **Assessment:**

- **Contact:**
  - ✓ Teachers assess their task (Sash joints) using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess the learners based on work submitted in the Google Classroom (Applications and characteristic of sash joints) using the rubric.

E. Resources (online and offline):

- ✓ CBLM
- ✓ https://woodandshop.com/the-house-jointer-make-sash-windows/ (Process of making sash joints)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives		Core concepts (Chapters/Topics)
4.9.1	State the purpose of the haunch joint.	**4.9 Making haunch joints.**
4.9.2	State the application of haunch joint.	
4.9.3	Make a haunch joint.	

B. Competencies:

- ✓ Use haunch joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.9
  - ✓ Make the students perform operation sheet 4.9
  - ✓ The teacher explains the process of making haunch joints.
  - ✓ Leaners make haunch joints.

- **Non-contact:**
  - ✓ Make learners go through the link on making haunch joints (https://www.youtube.com/watch?v=yjPBFW3rp1k)
  - ✓ Make learners discuss on applications of haunch joints and the purpose of joints.

B. **Assessment:**

- **Contact:**
  - ✓ Teachers assess their haunch joint using rubrics.

- ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess the learners based on work submitted in the Google Classroom or any social media in groups.

C. Resources (online and offline):

- ✓ CBLM
- ✓ https://www.youtube.com/watch?v=yjPBFW3rp1k(Making haunch joint)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives		Core concepts (Chapters/Topics)
4.10.1	Define dowel joint.	**4.10 Making dowel joints**
4.10.2	State the application of dowel joints.	
4.10.3	State the purpose of the dowel plate.	
4.10.4	Make dowel joint.	

B. Competencies:

- ✓ Use dowel joint to make any product.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.10
  - ✓ Make the students perform operation sheet 4.10
  - ✓ The teacher provides a sample of dowel joints and explains on marking of the dowel joint.
  - ✓ Teacher help learners with marking and making dowel.
  - ✓ Leaners make dowel joints.

- **Non-contact:**
  - ✓ Make learners summarise after watching a video in the given link.
  - ✓ Learner to watch the video in given link showing the usage of dowel joint in making bookshelf https://www.youtube.com/watch?v=Er-p2jUCyCo

D. **Assessment:**

- **Contact:**
  - ✓ A teacher may assess their dowel joint using rubrics.
  - ✓ Assess the use of PPE and OHS while handling tools and machines.

- **Non-contact:**
  - ✓ Assess the learners based on work submitted in Google.

E. Resources (online and offline):

- ✓ CBLM

- ✓ https://www.youtube.com/watch?v=Er-p2jUCyCo (Dowel joints used in a bookshelf)

A. Learning objectives/ Broad theme / Strand/Chapter/topic:

Learning objectives	Core concepts (Chapters/Topics)
4.11.1 Define estimation and costing. 4.11.2 State methods of estimation and costing. 4.11.3 Explain the purpose of estimation using the Bhutan Schedule of Rates (BSR). 4.11.4 Estimate basic cost of wooden components product. 4.11.5 Perform basic estimation of materials.	**4.11 Performing basic estimation of materials**

B. Competencies:

- ✓ Carry out estimation of the materials using BSR.

C. Pedagogy/Learning Experiences

- **Contact**:
  - ✓ Make the students read information sheet 4.11
  - ✓ Explain the process of estimating.
  - ✓ Make the students perform operation sheet 4.11
  - ✓ Teacher to solve one sample question on estimation.

- **Non-contact:**
  - ✓ Provide sample solutions for solving estimation.
  - ✓ Make learners explore the purpose of estimation.
  - ✓ Make learners research on how they estimate materials when they make any kind of product
  - ✓ Make leaners do simple estimations on making a picture frame.
  - ✓ Make learners solve **SAMPLE SELF CHECK 4.11**

D. **Assessment:**

- **Contact:**
  - ✓ The teacher assesses learners after giving the task of estimating.
  - ✓ Assess learners by conducting a test.
  - ✓ Assess learners by asking questions in groups.

- **Non-contact:**
  - ✓ Assess the learners based on work submitted in the Google Classroom (Estimation of the picture frame)

E. Resources (online and offline):

✓ CBLM

Engineering Drawing (X)

Chapter 2: Drawing isometric projections.

A. Learning Objectives/Strand/Broad theme/Chapter/ topics

Learning objectives	Core concepts (Chapters/Topics)
2.1.1 Define drawing scale. 2.1.2 List the types of scale. 2.1.3 Convert scale for drawing	**2.1 Converting Scale for drawing**

B. Competencies:

✓ Convert the drawing scales as per the drawing ratios.

C. Pedagogy/Learning experiences

- **Contact:**
  - ✓ Make learners read INFORMATION SHEET 2.1
  - ✓ Make learners perform OPERATION SHEET 2.1.
  - ✓ The teacher solves one question on scaling using drawing.

- **Non-Contact**
  - ✓ Make learners take notes on the definition of drawing a scale and types of scale from a textbook.
  - ✓ Make learners go through the given link on sample solving question on scaling https://www.youtube.com/watch?v=kP-L7NaATwE
  - ✓ The teacher gives questions to solve using types of scale.

D. Assessment

- **Contact:**
  - ✓ Assess learners by conducting the test.
  - ✓ Make learners solve SAMPLE SELF CHECK 2.1 and given additional questions.
- **Non-Contact:**
  - ✓ Assess learners based on work submitted (Problem-solving on scaling).

E. Resources (Online and offline)

✓ Competency-Based Learning Materials

✓ https://www.youtube.com/watch?v=kP-L7NaATwE (Sample questions on scaling)

A. Learning Objectives/Strand/Broad theme/Chapter/ topics

Learning objectives	Core concepts (Chapters/Topics)
2.2.1 Define isometric drawing. 2.2.2 State the isometric terminologies. 2.2.3 Draw isometric blocks.	**2.2 Draw isometric blocks**

B. Competencies:

- ✓ Draw isometric blocks as per the given dimension in standards procedures.

C. Pedagogy/Learning experiences

- **Contact:**
  - ✓ Make learners read INFORMATION SHEET 2.2
  - ✓ Make learners perform OPERATION SHEET 2.2.
  - ✓ The teacher demonstrates drawing isometric blocks.

- **Non-Contact**
  - ✓ Make learners explore isometric terminologies and take notes.
  - ✓ Make learners go through the given link (drawing simple isometric block) https://www.youtube.com/watch?v=uWYl51QJ0Zw
  - ✓ Make learners watch the video on drawing complex isometric block. https://www.youtube.com/watch?v=nDCg8LSODnU
  - ✓ The teacher gives drawing to be converted into isometric blocks.

D. Assessment

- **Contact:**
  - ✓ Assess learners by asking questions.
  - ✓ Assess learners by giving drawings to be converted into an isometric block.

- **Non-Contact:**
  - ✓ Assess learners based on learner's responses submitted through Google classroom (Notes on isometric terminologies, drawing isometric block)

E. Resources (Online and offline)

- ✓ https://www.youtube.com/watch?v=nDCg8LSODnU **(**Drawing simple isometric block)
- ✓ Competency-Based Learning Materials
- ✓ https://www.youtube.com/watch?v=uWYl51QJ0Zw(Drawing isometric block).

A. Learning Objectives/Strand/Broad theme/Chapter/ topics

Learning objectives	Core concepts (Chapters/Topics)
2.3.1 Define orthographic projections 2.3.2 Draw six principle views 2.3.3 Explain the method of obtaining six principle views 2.3.4 Explain four quadrants with the help of diagrams 2.3.5 Differentiate between first and third angle projections 2.3.6 Draw orthographic projections	**2.3 Drawing an orthographic Projections**

B. Competencies:

- ✓ Draw orthographic projections to give an accurate overall representation of an object.

C. Pedagogy/Learning experiences

- **Contact:**
  - ✓ Make learners read INFORMATION SHEET 2.3
  - ✓ Make learners perform OPERATION SHEET 2.3.
  - ✓ Teacher to use ICT (video) on orthographic views and the differences between first and third angle projections.
  - ✓ The teacher demonstrates orthographic projections.

- **Non-Contact**
  - ✓ Make learners go through the given link (Six principle view) https://www.youtube.com/watch?v=_eC0uh_gXRQ
  - ✓ Make learners watch the video on the given link https://www.youtube.com/watch?v=1sjaelzuGAk (Information on orthographic view) and make learners write notes.
  - ✓ Make learners watch videos from the given link https://www.youtube.com/watch?v=mcxUTNkSyp4(Differences between first and third angle) to take notes on it.
  - ✓ Make learners watch all the videos from the above link and summarize each to be submitted in google classroom.

D. Assessment

- **Contact:**
  - ✓ Assess learners by conducting a class test.
  - ✓ Assess learners by asking questions.
  - ✓ Assess learners through drawing (converting blocks into orthographic views).

- **Non-Contact:**
  - ✓ Assess learners based on work submitted through Google classroom (Notes on Six principle views, differences between first and third angle).
  - ✓ Assess the learner's understanding by going through the summarized notes on each content.

E. Resources (Online and offline)

- ✓ https://www.youtube.com/watch?v=_eC0uh_gXRQ **(**Six principles view in orthographic)
- ✓ https://www.youtube.com/watch?v=mcxUTNkSyp4(Differences between first and third angle)
- ✓ Competency-Based Learning Materials

RESOURCES

1) Technical and Vocational Education and Training (TVET) New normalCurriculum Framework (Classes: PP-XII)
2) Competency Based Learning Materials (Furniture Making)