Pokhara University
Faculty of Science and Technology

Course Code: MEC 116	Full Marks: 100
Course Title: Basic Engineering Drawing (0-0-3)	Pass Marks: 45
Nature of the Course: Practical	Total Duration: 45 hours
Level: Bachelor	Program: BE

Course Description
This course is designed to provide students the knowledge and skills to draw, visualize and represent objects manually as well as with the application of computer aided techniques. The course will be delivered using tutorials and self-learnings by the students.

1. General Objectives
The general objectives of this course are:
- To enhance knowledge and skills to draw and visualize geometrical shapes of objects
- To enable students to draw, visualize and representation objects using Computer aided techniques.

2. Methods of Instruction
Lecture, discussions, demonstration, tutorials and assignments

3. Contents in Detail

Specific Objectives	Contents
Recognize the drawing instruments, drawing sheets, lettering and dimensioning.	**Unit I: Introduction to engineering drawing (3 hrs)** 1.1 Manual drawing instruments, drafting machines, drawing paper and materials, preparation for drawing, cautions in use of instruments, drawing sheets-their layout and planning 1.2 Technical lettering and dimensioning: Single-stroke letters, capital and lowercase letters, vertical and slant lettering, vertical and inclined numerals 1.3 Procedure for lettering, dimensioning terms and notations, theory of dimensioning, system of dimensioning, use of scales, units and general rules of dimensioning
Draw basic geometrical shapes	**Unit II: Geometrical Constructions (7 hrs)** 2.1 Construction involving lines and angles, bisecting and trisecting lines and angles, division of lines, proportional division of lines 2.2 Construction of polygons, constructions using tangents circles and arcs, open and cross belt tangents 2.3 Construction of conic and engineering curves: ellipse (four center method), parabola (Tangent method), hyperbola (eccentricity method), cycloid, involute, Archimedean spiral, helix.
Visualize objects through	**Unit III: Multi-view Drawings & Sectional Views (15 hrs)**

orthographic projections	3.1 Introduction to projection (point, line plane), orthographic projection 3.2 Selection of views, ways for making a multi-view drawing 3.3 Introduction of sectional views, half and full sectional views, offset sectional view, hatching lines
Illustrate the surface development	**Unit IV: Developments of surfaces (4 hrs)** 4.1 Introduction of surface development 4.2 Complete developments of truncated right solids (Cylinder, Cone, Pyramid and Prism), frustums of right solids (Cone & Pyramid)
Visualize and draw objects through isometric, oblique and perspective drawings	**Unit V: Isometric, Oblique and Perspective Projections (6 hrs)** 5.1 Introduction of Axonometric projection, isometric projection, methods and procedure for making an simple isometric drawing 5.2 Introduction of oblique projection and oblique drawing 5.3 Perspective projection, position of object, construction of one-point
Recognize symbols and use computer aided techniques to visualize and draw objects	**Unit VI: Symbols and Computer Aided Drawing (10 hrs)** 6.1 Electrical and Electronics symbols 6.2 Introduction to AutoCAD, Basic commands for 2D drawing like: Line, Circle, Polyline, Rectangle, Hatch, Fillet, Chamfer, Trim, Extend, Offset, Dim style, etc. 6.3 Basics of 3D drawings (In computer laboratory with only demonstration and practices)

Note: The figures in the parentheses indicate the approximate periods for the respective units.

4. Laboratory Work (45 hrs for a group of maximum 24 students)

Lettering and use of drawing instruments; Dimensioning; Geometrical and Projection drawing; Multiview drawings; Sectional views, Development of surfaces; Axonometric projection; Symbols and AutoCAD Drawing

5. Evaluation System and Students' Responsibilities

Evaluation System

The evaluation of a student may consist of attendance, assignments, term-exams, projects etc. The final examination will be held by the PU Examination Controller's Office. The internal and external evaluation detail is given in the table below:

Internal Evaluation	**Weight**	**Marks**	**External Evaluation**	**Marks**
Practical				
Attendance and Class Participation	10%		Semester-End examination	50
Drawing Sheets Evaluation	30%			
Assignment	10%			
Internal Assessment	50%			
Total Internal		50		
Full Marks: 50 + 50 = 100				

Students' Responsibilities

Each student must secure at least 45% marks separately in internal assessment and practical evaluation with 80% attendance in the class in order to appear in the Semester End Examination. Failing to get such score will be given NOT QUALIFIED (NQ) to appear the Semester-End Examinations. Students are advised to attend all the classes, formal exam, test, etc. and complete all the assignments within the specified time period. Students are required to complete all the requirements defined for the completion of the course.

6. Prescribed Books and References

Text Books

1. Luzadder, W. J. & Duff, J. F (2015). *Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production,* Pearson India Education Services.
2. *Luintel, M.C. (2018). Engineering Drawing I,* Heritage Publishers & Distributors Pvt. Ltd. Kathmandu.

References

1. Gill, P. S. (2009). *Engineering Drawing,* Seagull Books Pvt Ltd. India.
2. Dhawan, R. K. (2019). *A Textbook of Engineering Drawing,* S. Chand Publishing.
3. Omura, G. (2012). *Mastering AutoCAD 2013 and AutoCAD LT 2013,* John Wiley & Sons.