Name of Institute: Indus Institute of Technology and Engineering

Name of Faculty: Rahul Patel

Course code: ME0211
Course name: Engineering Graphics

Pre-requisites: None

Credit points: 3

Offered Semester: I

Course Coordinator

Full name: Rahul Patel
Department with siting location: DOM Lab, 1st Floor, Bhanwar Building.
Telephone: Ext: 3112
Email: rahulpatel.me@indusuni.ac.in
Consultation times: 9:00 AM to 5:00 PM (Working days)

Students will be contacted throughout the session via mail with important information relating to this course.

Course Objectives

1) To have the knowledge of interpretation of dimensions of different quadrant projections.
2) To understand the basic principles of engineering drawing
3) To have the knowledge of generating the pictorial views
4) To understand the practical aspects of various engineering curves.

Course Outcomes (CO)

After learning the course, the students should be able to,

1) Prepare and understand drawings.
2) Identify various D curves used in Engineering Drawing and their applications.
3) Use the principles of orthographic projections.
4) By studying about projections of solids students will be able to visualize three Dimensional objects and that will enable them to design new products.
5) Draw the projection of points and lines located in different quadrants
6) Represent the objects in three dimensional appearances.

Course Outline

	UNIT-1	
1	**Introduction to Engineering Graphics** Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions- Dimensioning systems – polygons-types of lines	**02**
2	**Engineering Curves** Classification and application of Engineering Curves, Construction of different methods of Ellipse, parabola and Hyperbola, construction of Conics, Cycloid Curves – Cycloid, Hypocycloid, Epicycloids, Involutes and Spirals.	**06**
3	**Projections of Points and Lines** Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length and inclination	**06**
	UNIT-2	
4	**Projections of Planes** Projections of planes (polygons, circle, and ellipse) with its inclination to one reference plane and with two reference planes, Concept of auxiliary plane method for projections of the plane.	**04**
5	**Projections of Solids** Classification of solids. Projections of solids (Cylinder, Cone, Pyramid, Prism) along with frustum of cone and pyramid with their inclinations to one reference plane and with two reference planes.	**06**
	UNIT-3	
6	**Orthographic and Sectional Orthographic Projections** Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for view from front, top and sides using first angle projection method and third angle projection method, introduction of section of objects, full sectional view	**10**
	UNIT-4	
7	**Isometric Projections** Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.	**08**

Method of delivery

Chalk-board (Face to Face Lecture), PPT & Video, Self-study material, Problem Based Learning.

Study time

	Lecture	Tutorial	Practical
No of hours/Week	1	0	4

Program Outcomes (PO)

PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the Professional solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilitiesand norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member orleader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CO-PO Mapping (PO: Program Outcomes)

PO/PSO CO	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3					2	1	-				
CO2	3	-	-	1	3	-	-	-	-	-	-	-
CO3	3	2	2	2	3	-	-	-	-	-	-	-
CO4	2	2	1	-	-	-	-	-	-	-	-	-
CO5	3	-	3	1	3	-	-	-	-	-	-	-
CO6	2	3	-	1	-	-	-	-	-	-	-	-

Blooms Taxonomy and Knowledge retention(For reference)

(Blooms taxonomy has been given for reference)

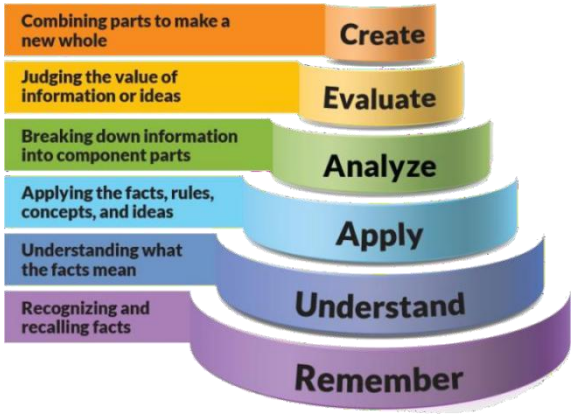

Figure 1: Blooms Taxonomy

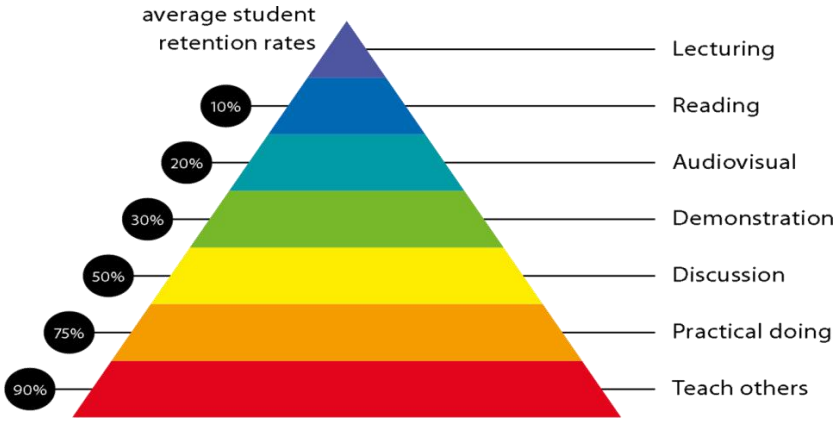

Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of _____ Graduate Capabilities
Informed Have a sound knowledge of an area of study	**1 Professional knowledge, grounding & awareness**
or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	
Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	**2 Information literacy, gathering & processing**
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.	**4 Problem solving skills**
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	**5 Written communication** **6 Oral communication** **7 Teamwork**
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	**10 Sustainability, societal & environmental impact**

Practical work: LIST OF PRACTICALS (SHEETS)

1) Engineering curves – I (Ellipse, parabola and Hyperbola)
2) Engineering curves – II (Cycloid, Hypocycloid, Epicycloids, Involutes, Spirals)
3) Projections of Points and Line
4) Projections of Planes
5) Projections of solids
6) Orthographic projection
7) Section Orthographic projection
8) Isometric Projection/view

Lecture/tutorial times : As per Time table

Attendance Requirements

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for semester examinations.

Details of referencing system to be used in written work

Text books

1. P. J. Shah, “A Text Book of Engineering Graphics” Publication: S. Chand.
2. P. D. Patel, “Engineering Graphics” Publication: Mahajan

Reference Books

1. N. D. Bhatt, “Elementary Engineering Drawing”, Charotar Publishing House, Anand
2. A text book of Engineering Drawing by R. K. Dhawan, S. Chand & Company Ltd., New Delhi
3. A text book of Engineering Drawing by P. S. Gill, S. K. Kataria & sons, Delhi
4. A Text Book of Machine Drawing By P. J. Shah S. Chand & Company Ltd., New Delhi

Additional Materials

http://nptel.ac.in/courses/112103019/

ASSESSMENT GUIDELINES

Your final course mark will be calculated from the following:

Tentative CIE Theory 60 Marks Bifurcation		Tentative Duration
40 Marks	Mid Sem exam	As per academic Calendar
10 Marks	3 Drawing Sheets (2 Drg sheet of Engg.Curves and 1 Drg sheet of Projection of Plane)	After completion of each Topic
10 Marks	Assignments (Lecture Topics) (Engg.Curves and Projection of Plane)	After completion of each Topic
Tentative CIE Practical 60 Marks Bifurcation		**Tentative Duration**
10 Marks	Lab Participation	Academic Session
20 Marks	Assignments (Lab Topics)	After completion of each Topic
30 Marks	5 Drawing Sheets 1) Projection of Point and Line 2) Orthographic Projection 3) Sectional Orthographic Projection 4) Projection of Solids 5) Isometric Projection	After completion of each Topic

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in internal component or less than 40% in the end semester will be considered for supplementary assessment in the respective components (i.e internal component or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (internal component or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

A report on the practical work is due the subsequent week after completion of the class by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of -% of the maximum mark per calendar day

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks aftermarking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.
Do not share your work with other students (except where required for a group activity orassessment).

Course schedule (subject to change)

Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
Weeks 1	Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing –Lettering –	1,2	Assignment Submission
Weeks 2	BIS Conventions- Dimensioning systems – polygons-types of lines. Classification and application of Engineering Curves, Construction of different methods of Ellipse, parabola and Hyperbola.	1,2	Worksheet Submission
Week 3	construction of Conics, Cycloid Curves – Cycloid, Hypocycloid, Epicycloids, Involutes and Spirals.	2,3	Worksheet submission, Quiz
Week 4	Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes.	3,4	Assignment and Worksheet Submission
Week 5	True length and inclination with the reference planes.	3,4	Assignment and Worksheet Submission

Week 6	Projections of planes (polygons, circle, and ellipse) with its inclination to one reference plane and with two reference planes, Concept of auxiliary plane method for projections of the plane.	4	Assignment and Worksheet Submission
Week 7	Classification of solids. Projections of solids (Cylinder, Cone, Pyramid, Prism) along with frustum of cone and pyramid with their inclinations to one reference plane and with two reference planes.	4,6	Assignment and Worksheet Submission
Week 8	Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for view from front, top and sides using first angle projection method and third angle projection method.	4,6	Assignment and Worksheet Submission, Quiz
Week 9	Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for view from front, top and sides using first angle projection method and third angle projection method.	5,6	Assignment and Worksheet Submission, Quiz
Week 10	Introduction of section of objects, fullsectional view.	4,5,6	Assignment Worksheet and Submission
Week 11	Isometric Scale, Conversion of orthographic views into isometric projection	5,6	Assignment Worksheet Submission
Week 12	Isometric view or drawing	4,6	Assignment and Worksheet Submission, Quiz