

CMR Institute of Technology, Bangalore			
Department(s): Basic Science & Humanities (Physics)			
Semester: 01	Section(s): I-O	Lectures/week: 05	
Subject: Engineering Visualization (Lab)		Code: 21EVN15/25	
Course Instructor(s): Dr. B. Rajendra Prasad Reddy			
Course duration: 30 Hrs			
Course Site: https://sites.google.com/a/cmrit.ac.in/computer_aided_engineering_drawing/home			
Google Classroom Link:			

Link to detailed syllabus:	
Course Objectives/ Expectations	The course will enable the students to: CLO1: Understand drawing as a communication mode CLO2: Expose students to standards and conventions followed in preparation of engineering drawings CLO3: Develop the ability of conveying the engineering information through drawings CLO4: Acquire the knowledge of generating the orthographic views of lines, planes and solids CLO5: Understand the development of surfaces and isometric projections. CLO6: To make them understand the relevance of engineering drawings to different engineering domains
Prerequisites	Basic constructions

Lesson Plan				
Lecture #	Book & Sections	Topics	Portions coverage	
			Teaching Aids/Course Delivery Methods	% of Syllabus Covered
1-10	TB1: - 1.1, 2.1-2.5	Introduction: for CIE only Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment. Selection of drawing sheet size and scale. Commands and creation of Lines, coordinate points, axes, polylines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet and curves. Orthographic Projections of Points, Lines and Planes: Introduction to Orthographic projections, Orthographic projections of points in all the quadrants. Orthographic projections of lines. (Placed in First quadrant only) Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon and circular laminae. (Placed in First quadrant only). Application on projections of Lines & Planes (For CIE only)	Online Platforms/ PPT Lectures for some topics	20

Links to some useful online lectures: Videos, assignments, quizzes, answers to old external question papers, notes and other e-material can be included

- <https://www.youtube.com/watch?v=TEzGnqhKpFI>
- <https://www.youtube.com/watch?v=kblxkkmAW0&t=8s>
- <https://www.youtube.com/watch?v=o1YPja2wCYQ>
- https://www.youtube.com/watch?v=fK4h5gM73w8&list=PLIhUrsYr8yHxEk_Jv8yOatn3Dcr6KYK3j
- https://www.youtube.com/watch?v=FtugLo9DMw8&list=PLIhUrsYr8yHz_FkG5tGWXaNblxVci bQvV
- <https://www.youtube.com/watch?v=AoNIOxnxDO0&list=PLIhUrsYr8yHx7TVB51jN3HZVyW3R6RiBg>
- <https://www.youtube.com/watch?v=op-fPNGqOOM&t=27s>
- <https://youtu.be/o2ASkqMfluk>
- https://youtu.be/eAX0RZ_Lmkk
- <https://youtu.be/Tf1tktk4ITE>
- <https://youtu.be/lz0xOV7GeFE>
- <https://youtu.be/HrYiZfG1Wml>
- <https://youtu.be/Nm31BZ4Vvkg>

11-25	TB1 3.1 - 3.2 4.4- 4.5	Orthographic Projection of Solids: Orthographic projection of right regular solids (Solids Resting on HP only); Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes, & Tetrahedron. Application problems on projection of solids. Projections of Frustum of cone, pyramid & truncated sphere (For CIE only).	Online Platforms/ PPT Lectures for some topics	40
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Links to some useful online lectures: Videos, assignments, quizzes, answers to old external question papers, notes and other e-material can be included

- <https://youtu.be/sAUxDfPUKw4>
- <https://youtu.be/fEfGBog37FE>
- <https://youtu.be/kFrNJtxZT-4>
- <https://youtu.be/kQ7q-xMxZ7g>
- <https://youtu.be/bE79s8h9mxc>
- <https://youtu.be/cdGCepsEHnE>
- <https://youtu.be/m7aJrnflc80>
- <https://youtu.be/qR9YPQRnz3k>
- <https://youtu.be/Bmqki4tGm8k>
- <https://youtu.be/Oj0L1HXhyyc>
- <https://youtu.be/Bmqki4tGm8k>
- <https://youtu.be/nREoLJt08gM>
- https://youtu.be/RA_clxLIGqw
- https://youtu.be/i0m_v3TKpoY
- <https://youtu.be/MyUD-OLvkg8>
- <https://youtu.be/Bmqki4tGm8k>

26-35	TB1 5.1 - 5.6	Isometric Projections: Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones and spheres. Isometric projection of combination of two simple solids. Conversion of simple isometric drawings into orthographic views. Problems on applications of Isometric projections of simple objects / engineering components. Introduction to drawing views using 3D environment (For CIE only)	Online Platforms/ PPT Lectures for some topics	60
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- ☐ <https://youtu.be/rCaLM5Osnqg>
- ☐ https://youtu.be/C0wo5x_qy5o
- ☐ <https://youtu.be/jzlxUKom5YQ>
- ☐ <https://youtu.be/0EJ5XavhOe8>
- ☐ <https://youtu.be/g9LyJt4FbEg>
- ☐ <https://youtu.be/TOurxkztIhE>
- ☐ <https://youtu.be/w1oqJNTzEqM>
- ☐ https://youtu.be/474R_T3ysEM
- ☐ <https://youtu.be/1XvZAWAm3DE>
- ☐ <https://youtu.be/l3G7cH13LaE>
- ☐ <https://youtu.be/XOCJhsNOemQ>
- ☐ <https://youtu.be/pT0HlUoZjVQ>
- ☐ <https://youtu.be/J76x5ySS52E>
- ☐ <https://youtu.be/f86BsAlyTew>

36-47	TB1 7.1- 7.4 8.1 -8.3	Development of Lateral Surfaces of Solids: Development of lateral surfaces of right regular prisms, cylinders, pyramids, and cones resting with base on HP only. Development of their frustums and truncations. Problems on applications of development of lateral surfaces like, funnels and trays. Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct (For CIE Only)	Online Platforms/ PPT Lectures for some topics	80
Links to some useful online lectures: Videos, assignments, quizzes, answers to old external question papers, notes and other e-material can be included ☐ https://www.youtube.com/watch?v=hljpRonTkIs&list=PLIhUrsYr8yHwdB96ft6c0Uwc4SDCLuG1v ☐ https://www.youtube.com/watch?v=zIblZ7dt3Dk ☐ https://www.youtube.com/watch?v=ch0nrjL11VA				
48-50	TB1 7.1- 7.4 8.1 -8.3	Multidisciplinary Applications & Practice (For CIE Only): Free hand Sketching; True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains, Ratchets, two wheeler cart & Four wheeler carts to dimensions etc Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic power distribution system using suitable software Basic Building Drawing; Like, Architectural floor plan, basic foundation drawing, steel structures- Frames, bridges, trusses using Auto CAD or suitable software, Electronics Engineering Drawings- Like, Simple Electronics Circuit Drawings. Graphs & Charts: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.	Online Platforms/ PPT Lectures for some topics	100
Links to some useful online lectures: Videos, assignments, quizzes, answers to old external question papers, notes and other e-material can be included ☐ https://www.youtube.com/watch?v=asVQ3ncmqhY ☐ https://www.youtube.com/watch?v=h3OXorong08				

Text Books	
1.	Bhatt, N.D., Engineering Drawing: Plane and Solid Geometry, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.
2.	Gopalakrishna K.R., Engineering Graphics, 32nd edition, Subash Stores, Bangalore, 2005.
Reference Books	
1.	Luzadder Warren J., Duff John M., Fundamentals of Engineering Drawing: with an Introduction to Interactive Computer Graphics for Design and Production, Prentice-Hall of India Pvt. Ltd., New Delhi, Eastern Economy Edition, 2005.
2.	Dhawan R. K., A Textbook of Engineering Drawing, 3/e, S. Chand Publishing, 2019.
3.	Venugopal K., Engineering Drawing and Graphics, New Age International publishers, 2014.
4.	Parthasarathy N. S., Vela Murali, Engineering Drawing, Oxford University Press, 2015.
5.	Bhattacharya S. K., Electrical Engineering Drawing, New Age International publishers, second edition 1998, reprint 2005.
6.	Chris Schroder, Printed Circuit Board Design using AutoCAD, Newnes, 1997.

Syllabus for Internal Assessment Tests (IAT*)

IAT #	Syllabus
IAT-1	Class # 01 – 10
IAT-2	Class # 11 - 25
IAT-3	Class # 26 - 50

*See calendar of events for IAT schedule.

Evaluation : Quiz/Assignment/Seminar/Mini Project/Viva

- ☐ *Evaluation of course delivery is based on any one of the above*
- ☐ *Evaluation guidelines to be provided to help students understand how the evaluation would be done for assignments, quiz, and so on.*
- ☐ *Evaluation tools/method to be mentioned e.g.: Easy polls, Survey Monkey, Typeform or inbuilt poll option in video conferencing tool.*
- ☐ *'Work-book' section includes additional activities to support self-learning e.g. exercises, game-based learning, case-study, and so on.*

Evaluation Method	Remarks
No of Assignments/Quiz or any of the mentioned above given	5
Assignment1/Quiz/Others:	After projection of points and lines
Assignment2/Quiz/Others:	After Projection of Planes
Assignment3/Quiz/Others:	After Projection of Solids
Assignment4/Quiz/Others:	After Isometric Projections
Assignment5/Quiz/Others:	After Development of Surfaces
Mention the issue date and submission date of all the above	

Evaluation guidelines (please provide the link)	https://drive.google.com/file/d/1aHTosytQMTfehB-pPeWq89OqRDMF2hQ2/view?usp=sharing
Evaluation tools/method	Evaluation of sketchbook, Printouts.
Flipped Classroom process for students to understand	

Workbook (Additional activities to support self-learning e.g. exercises, game-based learning, case-study etc.)	
please provide the link to access the work book information	

Peer Learning (teacher should list out the opportunities provided to interact with peers,(through discussions & group work).	

Discussion Board (teacher should set up problem-solving forums or discussion boards, and assign students or student teams to monitor and support or direct questions).	
Google Classroom	

Virtual Lab (for lab subject only). Provide the details of various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self-evaluation.	
please provide the link to access the virtual lab information	

Mention the best practices identified as part of teaching this subject	
1. Pictorial Representation of all problems 2. Use of 3-D models to explain difficult problems 3. Use of animation videos for better understanding	

Mention the Importance of this subject along with Real Time Applications	
1. Very helpful in visualizing and analyzing structures 2. Useful to create prototype of various projects/models 3. With the grasp of this subject, various engineering drawings in real life can be understood better.	

Course Outcomes (COs)

By the end of this course, students will be able to :

CO 1. Prepare and understand engineering drawings.

CO 2. Identify and apply the principles of orthographic projections of lines, planes and solids.

CO 3. Identify and apply the principles of orthographic projections and prepare development of lateral surfaces.

CO 4. Visualize three dimensional objects and develop isometric projections.

CO 5. Visualize engineering components.

CO-PO and CO-PSO Mapping (ISE)

Course Outcomes		Blo oms Lev el	Mo du le s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	-	-	-	-
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	1	-	-	-
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-

CO-PO and CO-PSO Mapping (CSE)

Course Outcomes		Blo oms Lev el	Mo du le s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	-	-	-	-
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	1	-	-	-
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-

CO-PO and CO-PSO Mapping (CIVIL)																			
Course Outcomes		Blo oms Lev el	Mo dule s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	-	1	-	-
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	-	1	-	-
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-

CO-PO and CO-PSO Mapping (MECH)																			
Course Outcomes		Blo oms Lev el	Mo dule s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	-	1	-	-
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	-	1	-	-
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-

CO-PO and CO-PSO Mapping (EEE)																			
Course Outcomes		Blo oms Lev el	Mo dule s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	1	-	-	
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	1	-	-	
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	1	

CO-PO and CO-PSO Mapping (AI&DS)																			
Course Outcomes		Blo oms Lev el	Mo dule s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	-	-	-	-
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	-	-	-	-
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-

CO-PO and CO-PSO Mapping (AI&ML)																			
Course Outcomes		Blo oms Lev el	Mo dule s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	-	-	-	-
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	-	-	-	-
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	-
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	1	-	-

CO-PO and CO-PSO Mapping (ECE)

Course Outcomes		Blo oms Lev el	Mo dule s cov ered	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	
CO 1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.	L1	1	1	1	1	-	1	1	-	-	1	1	-	-	1	-	-	
CO 2	Produce computer generated drawings using CAD software.	L2	2,3,4 &5	1	1	1	1	1	-	-	-	1	1	-	-	1	-	-	
CO 3	Use the knowledge of orthographic projections to represent engineering. Information / concepts and present the same in the form of drawings.	L2	2,3,4 &5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	
CO 4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	-	
CO 5	Convert pictorial and isometric views of simple objects to orthographic views.	L3	5	2	2	2	1	1	-	-	-	1	2	-	2	-	-	1	

PROGRAM SPECIFIC OUTCOMES (PSO) (CIVIL)	
PSO1	Apply knowledge and skills to perform diverse tasks of construction industry.
PSO2	Analyse, design and develop construction information details of simple structural elements and basic civil engineering systems.
PSO3	Support diverse tasks of construction project management as construction engineer.
PSO4	Pursue interests in specializations leading to bigger and diverse career opportunities.

PROGRAM SPECIFIC OUTCOMES (PSO) (ISE)	
PSO1	Implement and maintain enterprise solutions using latest technologies.
PSO2	Develop and simulate wired & wireless network protocols for various network applications using modern tools.
PSO3	Apply the knowledge of Information technology and software testing to maintain legacy systems.
PSO4	Apply knowledge of web programming and design to develop web based applications using database and other technologies.

PROGRAM SPECIFIC OUTCOMES (PSO) (CSE)	
PSO1	Design and develop applications using different stacks of web and programming technologies
PSO2	Design and develop secure, parallel, distributed, networked, and digital systems
PSO3	Apply software engineering methods to design, develop, test and manage software systems.
PSO4	Design and develop intelligent applications for business and industry

PROGRAM SPECIFIC OUTCOMES (PSO) (ECE)	
PSO1	Apply principles of electrical and electronic circuit theory to i) design and simulate basic electronic circuits and ii) make use of the measuring instruments including 'digital storage oscilloscope' in elaborate circuit analysis and in the design of analog and digital circuits
PSO2	Apply principles of mathematics, signal processing and communication theory to analyse different types of signals, operations on signals, design and realization of simple systems like digital filters, modulators, demodulators, microwave antennas and resonators and support activities of design of communication engineering and VLSI systems
PSO3	Take part in collaborative and consultancy projects as an electronic design engineer and support diverse tasks of circuit design projects, schedule, quality and efficiency management, and documentation and publication of reports.

PROGRAM SPECIFIC OUTCOMES (PSO) (EEE)	
PSO1	Apply electrical and electronic principles to circuits, machines, power systems and control systems
PSO2	Develop solutions in the areas of industrial automation, green energy systems and smart grids
PSO3	Able to contribute to project teams in the core and associated domains of electrical and electronic technology

PROGRAM SPECIFIC OUTCOMES (PSO) (MECH)	
PSO1	Apply principles of physics, knowledge of material properties and strength, manufacturing methods, design codes and standards, and best practices to design, analyse and develop solutions in engineering and service sectors.
PSO2	Contribute to the project teams in the core and associated domains by applying knowledge of engineering graphics to read, interpret and create an engineering drawing, and by using modern tools for drafting, modelling, analysing and simulating the product.
PSO3	Identify and articulate industrial problems and solve with the use of management tools for optimum solutions and realistic outcomes.
PSO4	Translate fundamental knowledge of thermal sciences and attempt solutions independently for real life situations.

PROGRAM SPECIFIC OUTCOMES (PSO) (AI&DS)	
PSO1	To understand the given problem and formulate the smart solutions with fundamental engineering knowledge and appropriate analytical and technical skills.
PSO2	To be able to propose and implement software applications with the concepts of data structures, analysis of algorithms, DBMS, cloud computing and applications, machine learning and data analytics related tools and techniques.
PSO3	To build an artificial Intelligence and data visualization based, secured business solutions by means of Fuzzy logic and its applications, Deep Learning , business Intelligence, Blockchain, soft and evolutionary computing and Data Security and Privacy subjects.
PSO4	To apply mathematical notion in computational tasks and software project development to produce quality products.

PROGRAM SPECIFIC OUTCOMES (PSO) (AI&ML)	
PSO1	To design and develop software systems with the knowledge of data structures, analysis of algorithms, web design, machine learning and Image processing techniques.
PSO2	To design and develop networking and embedded software solutions by means of data communication, sensors and its applications, robotics, virtual reality and Internet of Things.
PSO3	To apply mathematical principles in computational tasks and software project development to produce quality products.
PSO4	To ideate intelligent solutions for real world business problems with appropriate analytical and technical skills.

Identified curriculum gap if any and Justification:

Identified Gap	Justification

Proposed Actions to fill the identified gaps:

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Course Instructor Signature/s

CCI Signature

HOD