Vishwakarma Institute of Technology, Pune-37

Programme: Computer Engineering

Course Outcomes [CO] -Programme Outcomes[PO] – Programme Specific Outcomes [PSO] Mapping

Academic Year 2023-24

Computer Engineering Department

Department Vision and Mission

Department Vision

To be a leader in the world of computing education practising creativity and innovation

Department Mission

To ensure students' employability by developing aptitude, computing, soft, and entrepreneurial skills

To enhance academic excellence through effective curriculum blended learning and comprehensive assessment with active participation of industry

To cultivate research culture resulting in knowledge-base, quality publications, innovative products and patents

To develop ethical consciousness among students for social and professional maturity to become responsible citizens

Programme Education Objectives [PEOs]

Engineering Graduates will be able to

PEO	PEO Focus	PEO Statement
PEO1	**Preparation**	Demonstrate application of sound engineering foundations to be a committed technology workforce
PEO2	**Core competence**	Apply mathematical and computing theory knowledge base to provide realistic computer engineering solutions
PEO3	**Breadth**	Exhibit problem solving skills and engineering practices to address problems faced by industry with innovative methods, tools and techniques
PEO4	**Professionalism**	Develop professional and ethical practices adopting effective guidelines to acquire desired soft skills in the societal and global context
PEO5	**Learning Environment**	Aim for continuing education and entrepreneurship in emerging areas of computing

Programme Specific Outcomes

Engineering Graduates will be able to

PSO	PSO Statement
PSO1	Select and incorporate appropriate computing theory principles, data structures and algorithms, programming paradigms to innovatively craft scientific solution addressing complex computing problems.
PSO2	Adapt to new frontiers of science, engineering and technology by getting acquainted with heterogeneous computing environments and platforms, computing hardware architectures and organizations through continuous experimentation.
PSO3	Conceive well-formed design specifications and constructs assimilating new design ideas and facts for identified real world problems using relevant development methodologies and practices, architecture styles and design patterns, modeling and simulation, and CASE tools.
PSO4	Exercise research and development aptitude focusing knowledge creation and dissemination through engineering artifacts construction, preparation and presentation of engineering evidences using procedures, techniques, guidelines, and standards considering technology migration and evolution.

Engineering Graduates will be able to

PO	Graduate Attributes	PO Statement
PO1	**GA: 1 Engineering Knowledge**	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**GA: 2 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	**GA: 3: Design/ Development of solution**	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, andenvironmental considerations.
PO4	**GA: 4: Conduct Investigation 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	**GA: 5: Modern Tool Usage**	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**GA: 6 : 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	**GA: 7: Environment and sustainability**	Understand the impact of the professional engineering solutions in societal and environmental contexts, anddemonstrate the knowledge of, and need for sustainable development.
PO8	**GA: 8 : Ethics**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**GA: 9: Individual and Team Work**	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**GA: 10: Communication**	Communicate effectively on complex engineering activities with the engineering community and with society atlarge, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**GA: 11 : Project Management and Finance**	Demonstrate knowledge and understanding of the engineering and management principles and apply these toone's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**GA: 12: Lifelong 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.

Overview of CO-PO –PSO Assignment Structure

YEAR	CORE					SUPPORTING							PROGRAMM ESPECIFIC OUTCOMES			
	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
S.Y.	SELECT 3 POS 2 X 3 1 X 2					SELECT 2 POS 1 X 2 1 X 1							SELECT 1 PSO			
T.Y.	SELECT 3 POS 2 X 3 1 X 2					SELECT 2 POS 1 X 2 1 X 1							SELECT 1 PSO			
B.TECH.	SELECT 2 POS 2 X 3					SELECT 3 POS 2 X 2 1 X 1									SELECT 1 PSO	

B.Tech. (Computer Engineering)

Pattern ‘B-18’

Effective from Academic Year 2023-24

SY- Structure - Module III

Code	Course Name	Programme Outcomes											Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
MD2201	Data Science	2.66	2.66	2.5	2.5	2.25	2.0						2.0	2.5		2.0	
CS2221	Internet of Things	2.0	2.5	3.0	2.0	3.0	2.0	2.0	2.0		2.0	1.0	2.0	2.0	3.0	3.0	3.0
CS2218	Object Oriented Programming	3	2.5	2.83	1.0	1.0	2.0	2.0	2.25			2.0	2.0	3.0	3.0	3.0	3.0
CS2227	Database Management System	2.0	2.75	3.0	2.0	2.0		2.0			2.0	2.0	2.0	3.0	3.0	2.0	3.0
CS2243	Principles of Programming Languages	2.5	2.33	2.5	1.0			2.0	2.0		1.0		2.33	3.0		2.33	
CS2229	Design Thinking-3	1.57	1.57	1.71	1.71	1.57	2.0	1.0	2.33	2.0	3.0	1.0	1.0				
CS2242	Engineering Design and Innovation-III	2.0	2.0	2.83	2.83	2.6	2.5	2.0	2.0	3.0	1.0	2.16	2.0	3.0	3.0	3.0	3.0

PO1	GA: 1 Engineering Knowledge	PO6	GA: 6 : The Engineer and Society
PO2	GA: 2 Problem Analysis	PO7	GA: 7: Environment and Sustainability
PO3	GA: 3: Design/ Development of solution	PO8	GA: 8 : Ethics
PO4	GA: 4: Conduct Investigation of Complex Problems	PO9	GA: 9: Individual and Team Work
PO5	GA: 5: Modern Tool Usage	PO10	GA: 10: Communication
		PO11	GA: 11 : Project Management and Finance
		PO12	GA: 12: Lifelong Learning

SY- Structure - Module IV

Code	Course Name	Programme Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CS2041	Advanced Data Structures	2.5	3.0	2.66	3.0			2.0	2.0				2.0	3.0	2.0	2.0	2.0
CS2008	Operating Systems	2	2.5	3.0	1.8		2.0	2.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	2.0
CS2245	Microprocessors & Microcontrollers	3	2.16	2.33	2.0	2.0		2.0	2.0	2.0		2.0	2.0	3.0	3.0	3.0	3.0
CS2246	Computer Graphics and Virtual Reality	2.66	2.83	3.0	1.0	3.0	2.0	1.33	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	2.0
CS2247	Theory of Computation	2	3	2.33	1.33			2					2	3		2	
CS2229	Design Thinking-3	1.57	1.57	1.71	1.71	1.57	2.0	1.0	2.33	2.0	3.0	1.0	1.0				
CS2242	Engineering Design and Innovation-III	2.0	2.0	2.83	2.83	2.6	2.5	2.0	2.0	3.0	1.0	2.16	2.0	3.0	3.0	3.0	3.0

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B.Tech. (Computer Engineering)

Pattern ‘C-18’

Effective from Academic Year 2018-19

TY- Structure - Module V

Code	Course Name	Programme Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CS3052	Computer Networks (Modules V & VI))	2.84	2.67	2.67	2.0	2	2	3	3	3	3	0	3	3	3	2	2
CS3205	Design and Analysis of Algorithms	2	3	2.66	1.0			2.0					2.0	3		2	
CS3215	Web Technology	2.66	2.66	2.66	1.0	2	2	2	2	2.0	3.0	2.0	3.0	1.0		2.66	2.0
CS3061	Software Modelling and Design	2.66	2.33	2.66		3	2	2	2	2.0	3.0	2.0	3.0	1.0	2.0	2.66	2.0
CS3059	Design Thinking-5	1.57	1.57	1.71	1.71	1.57	2.0	1.0	2.33	2.0	3.0	1.0	1.0				
CS 3060	Engineering Design and Innovation – 3	2.0	2.0	2.83	2.83	2.6	2.5	2.0	2.0	3.0	1.0	2.16	2.0	3.0	3.0	3.0	3.0

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TY- Structure - Module VI

Code	Course Name	Programme Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CS3226	Cloud Computing	2.50	2.00	1.40	2.20	1.83	3.00	3.00	3.00	2.00	3.00	2.00	3.00		2.0	2.50	2.00
CS3202	Artificial Intelligence	2.0	2.8	3.0	1.8			3.00	2.00	2.00	2.00		2.16	2.33	2.0	2.50	2.00
CS3220	Cyber Security	2.67	2.5	2.2	2.2	2	2.5	2.5	3	1.8	3	2.67	2.25	3	3	1.5	2.8
CS3053	Compiler Design	2.67	2.83	2	1.75	2	2	3	2	1	0	0	2	3	3	3	2
CS3059	Design Thinking-5	1.57	1.57	1.71	1.71	1.57	2.0	1.0	2.33	2.0	3.0	1.0	1.0				
CS 3060	Engineering Design and Innovation - 3	2.0	2.0	2.83	2.83	2.6	2.5	2.0	2.0	3.0	1.0	2.16	2.0	3.0	3.0	3.0	3.0

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B.Tech. (Computer Engineering)

Pattern ‘D-18’

Effective from Academic Year 2018-19

B. Tech. Structure - Module VII/ VIII

Code	Course Name	Programme Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	*Elective 1 (OE-1)																
MD4202	Project Management	2.0	1.5			3.0	1.0	1.0		1.33	1.0	3.0	1.0		2.0		3.0
LL4001	Generative AI																
	*Elective 2 (OE-2)																
CS4217	Human Computer Interaction	2.5	2.6	3.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	1.0	2.0			2.5	2.0
CS4272	Neural Networks																
CS4222	Image Processing	2.8	2.16	2.7	1.88	3	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	3.0	3.0
ET4230	Natural Language Processing	3	2.16	3	2.6	3	2			1		3	2	2.5	2.6	3	3
	*Elective 3 (OE-3)																
CS4274	Machine Learning-Swayam																
CS4275	Deep Learning-Swayam																
CS4225	Major Project	2.0	2.8	2.75	2.83	2.0	3.0	3.0	2.0	3.0	2.75	2.0	3.0	3.0	1.75	3.0	3.0

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B. Tech. Structure - Module VII/ VIII

Code	Course Name	Programme Outcomes												Program Specific Outcomes			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	*Elective Group 3 (OE-3)																
CS4232	Industry Internship	2.0	3.0	2.66	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.66
CS4234	International Internship																
CS4202	Research Internship	2.8	2.75	2.75	233	3.0	2.5	2.5	2.0	3.0	2.75	2.0	3.0	3.0	3.0	3.0	3.0

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