Pandit Deendayal Energy University

School of Technology

Department of Computer Science and Engineering

Under Graduate Curriculum Handbook (w. e. f. Academic Year 2024-28)

B. Tech.

(Computer Science and Business Systems)

w. e. f. July, 2024.

Vision

"To contribute to the society by imparting transformative education and producing globally competent professionals having multidisciplinary skills and core values to do futuristic research & innovations."

Mission

- To accord high quality education in the continually evolving domain of Computer Engineering by offering state-of-the-art undergraduate, postgraduate, doctoral programmes.
- To address the problems of societal importance by contributing through the talent we nurture and research we do:
- To collaborate with industry and academia around the world to strengthen the education and multidisciplinary research ecosystem.
- To develop human talent to its fullest extent so that intellectually competent and imaginatively exceptional leaders can emerge in a range of computer professions.

Program Educational Objectives (PEOs)

PEO-1. To prepare graduates who will be successful professionals in industry, government, academia, research, entrepreneurial pursuit and consulting firms

PEO-2. To prepare graduates who will make technical contribution to the design, development and production of computing systems

PEO-3. To prepare graduates who will get engage in lifelong learning with leadership qualities, professional ethics and soft skills to fulfill their goals

PEO-4. To prepare graduates who will adapt state of the art development in the field of computer engineering

Program Outcomes (POs)

PO-1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-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.

PO-3. 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.

PO-4. 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.

PO-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.

PO-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.

PO-7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO-10. 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.

PO-11. 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.

PO-12. 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.

Program Specific Outcomes (PSOs)

PSO-1. Develop computer engineering solutions for specific needs in different domains applying the knowledge in the areas of programming, algorithms, hardware-interface, system software, computer graphics, web design, networking and advanced computing.

PSO-2. Analyze and test computer software designed for diverse needs.

PSO-3. Pursue higher education, entrepreneurial ventures and research.

CSBS Course Outline

Sem		Course Name	Th	Tut	Pra	Hrs	Cr
Sem I	HSC	Humanities-I	2	0	0	2	2
	BSC	Environment Science	2	0	0	2	2
	BSC	Applied Physics	3	0	0	3	3
	BSC	Applied Physics Laboratory	0	0	2	2	1
	BSC	Introductory Topics in Statistics, Probability and Calculus	2	0	0	2	2
	ESC	Principles of Electrical Engineering	3	0	0	3	3
	ESC	Principles of Electrical Engineering Laboratory	0	0	2	2	1
	ESC	Business Communication & Value Science – I	2	0	0	2	2
	ESC	Fundamentals of Computer Science	1	0	0	1	1
	ESC	Fundamentals of Computer Science Laboratory	0	0	2	2	1
	HSC	Universal Human Values	1	0	0	1	1
	HSC	Indian Knowledge System	2	0	0	2	2
			18	**0**	**6**	**24**	**21**
Sem II	HSC	Humanities – II	2	0	0	2	2
	BSC	Linear Algebra	3	1	0	4	4
	BSC	Statistical Methods	3	1	0	4	4
	ESC	Principles of Electronics	3	0	0	3	3
	ESC	Principles of Electronics Laboratory	0	0	2	2	1
	ESC	Business Communication & Value Science – II	2	0	0	2	2
	HSC	Yoga, Health & Hygiene OR NCC/NSS	2	0	0	2	1
	HSC	Fundamentals of Economics	2	0	0	2	2
	ESC	Data Structures & Algorithms	3	0	0	3	3
	ESC	Data Structures & Algorithms Laboratory	0	0	2	2	1
			20	**2**	**4**	**26**	**23**
Sem III	Pro	Civic and Social Service Internship	0	0	0	0	1
	BSC	Discrete Mathematics	3	0	0	3	3
	PC	Database Management System	3	0	0	3	3
	PC	Database Management System Laboratory	0	0	2	2	1
	PC	Computer Organization & Architecture	3	1	0	4	4
	ESC	Business Communication & Value Science – III	3	0	0	3	3
	PC	Object Oriented Programming	3	0	0	3	3
	PC	Object Oriented Programming Laboratory	0	0	2	2	1
			15	**1**	**4**	**20**	**19**
Sem IV	ESC	Introduction to Innovation, IP Management & Entrepreneurship	3	0	0	3	3
	OE	Financial Management	3	0	0	3	3
	BSC	Operations Research	3	0	0	3	3
	BSC	Operations Research Laboratory	0	0	2	2	1
	PC	Operating System	3	0	0	3	3
	PC	Operating System Laboratory	0	0	2	2	1
	PC	Formal Language and Automata Theory	3	1	0	4	4
	PC	Design and Analysis of Algorithm	3	0	0	3	3
	PC	Design and Analysis of Algorithm Laboratory	0	0	2	2	1

	Pro	**Essence of Indian Traditional Knowledge (Non Credit)**	0	0	0	0	0
			18	**1**	**6**	**25**	**22**
Sem V	OE	Open Elective II **((NPTEL/SWAYAM/MOOC))**	3	0	0	3	3
	HSC	Design Thinking	2	0	0	2	2
	HSC	Design Thinking Laboratory	0	0	2	2	1
	PE	Program Elective 1	3	0	0	3	3
	PC	Computer Networks	3	0	0	3	3
	PC	Computer Networks Laboratory	0	0	2	2	1
	PC	Software Engineering	3	0	0	3	3
	PC	Software Engineering Laboratory	0	0	2	2	1
	PC	Cloud, Microservices & Application	3	0	0	3	3
			17	**0**	**6**	**23**	**20**
Sem VI	OE	Business Communication & Value Science – IV	3	0	0	3	3
	PE	Program Elective 2	3	0	0	3	3
	PE	Program Elective 3	3	0	0	3	3
	PC	Machine Learning	3	0	0	3	3
	PC	Machine Learning Laboratory	0	0	2	2	1
	PC	Information Security	3	0	0	3	3
	PC	Information Security Laboratory	0	0	2	2	1
	PC	Artificial Intelligence	3	0	0	3	3
	PC	Artificial Intelligence Laboratory	0	0	2	2	1
			18	**0**	**6**	**24**	**21**
Sem VII	Pro	Summer Internship	0	0	0	0	2
	OE	Marketing Research & Marketing Management	3	0	0	3	3
	PE	Program Elective 4	3	0	0	3	3
	PE	Program Elective 5	3	0	0	3	3
	PC	Data Visualization	3	0	0	3	3
	PC	Data Visualization Laboratory	0	0	2	2	1
	PC	Usability Design of Software Applications	2	0	0	2	2
	PC	Usability Design of Software Applications Laboratory	0	0	2	2	1
	PC	IT Project Management	2	0	0	2	2
	PC	IT Project Management Laboratory	0	0	2	2	1
	Pro	**Seminar**	0	0	0	0	1
			16	**0**	**6**	**22**	**22**
Sem VIII		**Course Name**	**Th**	**Tut**	**Pra**	**Hrs**	**Cr**
	Pro	Major/Comprehensive Project					**12**

Total Credits: 160

List of Electives

PE	**Program Elective I**	**3**	**0**	**0**	**3**	**3**
	Conversational Systems					
	Business Strategy					
	Compiler Design + Laboratory (LEX & YACC)					
PE	**Program Elective II**	**3**	**0**	**0**	**3**	**3**
	Robotics and Embedded Systems					
	Modern Web Applications					
	Data Mining and Analytics					
PE	**Program Elective III**	**3**	**0**	**0**	**3**	**3**
	Enterprise Systems					
	Natural Language Processing					
	Advance Finance					
	Image Processing and Pattern Recognition					
PE	**Program Elective IV**	**3**	**0**	**0**	**3**	**3**
	Cognitive Science & Analytics					
	Introduction to IoT					
	Generative AI					
	Cryptology					
PE	**Program Elective V**	**3**	**0**	**0**	**3**	**3**
	Quantum Computation & Quantum					
	Information Retrieval					
	Advanced Social, Text and Media					
	Mobile Computing					