Punyashlok Ahilyadevi Holkar Solapur University, Solapur

NAAC Accredited-2022
'B^{++}' Grade (CGPA 2.96)

Name of the Faculty: Science and Technology

CHOICE BASED CREDIT SYSTEM

Structure

Name of the Course: B.Tech. (Computer Science & Engineering)

(Syllabus to be implemented from June 2021)

Programme Educational Objectives and Outcomes

A. Program Educational Objectives

1. To make students competent for professional career in Computers, IT & allied fields.
2. To build strong fundamental knowledge amongst student to pursue higher education and continueprofessional development in Computers, IT & other fields
3. To imbibe professional ethics, develop team spirit and effective communication skills to besuccessful leaders and managers with a holistic approach.
4. To nurture students to be sensitive to ethical, societal & environmental issues while conductingtheir professional work.

B. Program Outcomes Engineering Graduate will be able to –

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

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.

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.

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.

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 withan understanding of the limitations.

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.

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.

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

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

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.

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.

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.

C. Program Specific Outcomes (PSOs)

1. Graduate has an ability to use technical skills necessary for design, maintenance, developmentand implementation of database systems and networking applications.

2. Graduate has an ability to provide IT solutions, develop mobile applications in multidisciplinaryareas using standard tools and techniques.

3. Graduate has an ability to utilize and apply software engineering tools for design and realizationof projects in various domains of Computer Science and Engineering.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE AND TECHNOLOGY
Structure of S.Y. B. Tech. (CSE) wef. 2021-2022Semester – I

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE	ISE	ICA	
CS211	Applied Mathematics-I	3	1		4	70	30	25	125
CS212	Discrete Mathematical Structures	3	1		4	70	30	25	125
CS213	Data structures	3			3	70	30		100
CS214	Computer Graphics	3			3	70	30		100
CS215	Microprocessors	3			3	70	30		100
CS216	Python Programming	2			2		25		25
	Sub Total	**17**	**2**		**19**	**350**	**175**	**50**	**575**
	Environmental studies	2				50			50
	Laboratory/Workshop					**ESE POE**			
CS213	Data structures			2	1	50		25	75
CS214	Computer Graphics			2	1			25	25
CS215	Microprocessors			2	1			25	25
CS216	Python Programming			2	1	50		25	75
	Sub Total			**8**	**4**	**100**		**100**	**200**
	Grand Total	**19**	**2**	**8**	**23**	**450**	**175**	**150**	**775**

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE AND TECHNOLOGY
Structure of S.Y. B. Tech. (CSE) wef. 2021-2022Semester – II

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE	ISE	ICA	
CS221	Applied Mathematics-II	3	1		4	70	30	25	125
CS222	Theory of Computation	3	1		4	70	30	25	125
CS223	Computer Organization and Architecture	3			3	70	30		100
CS224	Computer Networks	3			3	70	30		100
CS225	OOP using Java	2			2		25		25
	Total	**14**	**2**		**16**	**280**	**145**	**50**	**475**
	Environmental studies	2				50			50
	Laboratory/Workshop					**ESE POE**			
CS223	Computer Organization and Architecture			2	1			25	25
CS224	Computer Networks			2	1	50		25	75
CS225	OOP using Java			4	2	50		25	75
	Total			**8**	**4**	**100**		**75**	**175**
	Grand Total	**16**	**2**	**8**	**20**	**380**	**145**	**125**	**650**

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE AND TECHNOLOGY
Structure of T.Y. B. Tech. (CSE) wef. 2022-2023Semester-I

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE	ISE	ICA	
CS311	Artificial Intelligence	3			3	70	30		100
CS312	Operating Systems	3			3	70	30		100
CS313	Database Engineering	3			3	70	30		100
CS314	Design and Analysis of Algorithm	3			3	70	30		100
CS315	Mobile Application Development	2			2		25		25
SL31	Self Learning Module I (HSS)				1	50			50
	Sub Total	**14**			**15**	**330**	**145**		**475**
	Laboratory/Workshop					**ESE POE**			
CS311	Artificial Intelligence			2	1			25	25
CS312	Operating Systems			2	1			25	25
CS313	Database Engineering			2	1	50		25	75
CS314	Design and Analysis of Algorithm			2	1	50		25	75
CS315	Mobile Application Development			2	1	50		25	75
	Sub Total			**10**	**5**	**150**		**125**	**275**
	Grand Total	**14**		**10**	**20**	**480**	**145**	**125**	**750**

Note

1. Batch size for the practical/tutorial shall be of 15 students. On forming the batches, if the strength of remaining student exceeds 7, then a new batch shall be formed.
2. Vocational Training (evaluated at Final Year B. Tech. Semester VII) of minimum 15 days shall be completed in vacation/s after S.Y. B.Tech. Semester IV but before Final Year B.Tech. Semester VII & the report shall be submitted and evaluated in Final Year B.Tech. Semester VII
3. ICA assessment shall be a continuous process based on student's performance in – class tests, assignments, homework, subject seminars, quizzes, laboratory books and their interaction and attendance for theory and lab sessions as applicable.

4. Self-Learning Module I at T.Y. B.Tech. – I

Curriculum for Humanities and Social Sciences, Self Learning Module - I is common for all under graduate engineering programs.

A. Student can select & enroll a Self Learning Module I Course from PAH Solapur University, Solapur HSS Course List (SL31-A) and appear for university examination.

SL31-A: P. A. H. Solapur University, Solapur: HSS Course List

1. Economics	4. Stress and Coping
2. Intellectual Property Rights for Technology Development and Management	5. Professional Ethics & Human Value
3. Introduction to Sociology	

OR

B. Student can select and enroll for university approved minimum eight weeks NPTEL HSS course (SL31-B), complete its assignments and appear for certificate examination conducted by NPTEL. The list of courses as shown in Table SL31-B will be updated from time to time by University authorities. Latest updated list will be valid for selection of self learning Module-I (HSS) courses.
More details about NPTEL are available at http://nptel.ac.in

SL31-B: University approved NPTEL- HSS course List

1. Soft skills	15. Management of Inventory Systems
2. Introduction to Modern India Political Thought	16. Economic Growth and Development
3. Intellectual Property	17. Ethic in Engineering Practice
4. Technical English for Engineers	18. Corporate Social Responsibility
5. Developing Soft Skills and Personality	19. Marketing Management –I
6. Educational Leadership	20. Marketing Research and Analysis
7. Microeconomics: Theory & Applications	21. Selected Topics in Decision Modeling
8. Engineering Economics	22. Innovation, Business Models and Entrepreneurship
9. Human Resource Development	23. Simulation of Business Systems: An Applied Approach
10. Project Management for managers	24. Sustainability through Green Manufacturing Systems: An Applied Approach
11. Data Analysis and Decision Making - I	25. Total Quality Management - I
12. E-Business	26. Introduction to Operations Research
13. Working Capital Management	27. Knowledge Management
14. Industrial Safety Engineering	

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE	ISE	ICA	
CS321	System Programming	3			3	70	30		100
CS322	Internet of Things	3			3	70	30		100
CS323	Software Engineering	3	2		5	70	30	25	125
CS324	Professional Elective-I	3			3	70	30		100
CS325	Web UI and UX Technology	2			2		25		25
CSO326	Open Elective	2			2	50			50
	Sub Total	**16**	**2**		**18**	**330**	**145**	**25**	**500**
	Laboratory/Workshop					**ESE POE**			
CS321	System Programming			2	1			25	25
CS322	Internet of Things			2	1			25	25
CS324	Professional Elective-I			2	1			25	25
CS325	Web UI and UX Technology			2	1	50		25	75
CS326	Mini Project			2	1	50		25	75
	Sub Total			**8**	**5**	**100**	**0**	**125**	**225**
	Grand Total	**16**	**2**	**8**	**23**	**430**	**145**	**150**	**725**

Professional Elective – I	Open Elective
Cloud Computing	Biology for Engineers
Augmented Reality/Virtual Reality	Engineering Economics and Management
Network Security	Disaster Management

Note

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2. Vocational Training (evaluated at Final Year B. Tech. Semester VII) of minimum 15 days shall be completed in vacation/s after S.Y. B.Tech. Semester IV but before Final Year B.Tech. Semester VII & the report shall be submitted and evaluated in Final Year B.Tech. Semester VII
3. ICA assessment shall be a continuous process based on student's performance in – class tests, assignments, homework, subject seminars, quizzes, laboratory books and their interaction and attendance for theory and lab sessions as applicable.
4. Mini Project shall consist of developing software, based on various tools & technologies.
5. Project groups shall not be of more than **five** students.

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE AND TECHNOLOGY
Structure of Final Year B.Tech.(CSE) wef. 2023-2024
Semester-I

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE	ISE	ICA	
CS411	Software Testing and Quality Assurance	3			3	70	30		100
CS412	Compiler Construction	3			3	70	30		100
CS413	Professional Elective-II	3			3	70	30		100
CS414	Professional Elective-III	3			3	70	30		100
CS415	DevOps	2			2		25		25
SL41	Self Learning (Technical)				1	50			50
	Sub Total	**14**	**0**	**0**	**15**	**330**	**145**		**475**
	Laboratory/Workshop					**ESE POE**			
CS411	Software Testing and Quality Assurance			2	1			25	25
CS412	Compiler Construction			2	1			25	25
CS413	Professional Elective-II			2	1			25	25
CS414	Professional Elective-III			2	1			25	25
CS415	DevOps			2	1	50		25	75
CS416	Seminar			2	1			25	25
CS417	Vocational Training				1			25	25
	Sub Total			**12**	**7**	**50**		**175**	**225**
	Grand Total	**14**	**0**	**12**	**22**	**380**	**145**	**175**	**700**

Professional Elective-II :
Business Intelligence
Data Mining
Distributed Systems
Management Information System

Professional Elective-III :
Human Computer Interaction
Big Data Analytics
Information Retrieval

Note :
1. Batch size for the practical /tutorial shall be of 15 students. On forming the batches, if the strength of remaining students exceeds 7, then a new batch shall be formed.
2. Vocational Training (evaluated at Final Year B.Tech Semester VII) of minimum 15 days shall be completed in any vacation after S.Y. B.Tech Semester IV but before Final Year B.Tech Semester VII& the report shall be submitted and evaluated in Final Year B.Tech. Semester VII
3. Appropriate Professional Elective II& III Subjects may be added when required.
4. Project group for Final Year B.Tech. (Information Technology) Semester VII and Semester VIII shall not be of more than **five** students.
5. ICA assessment shall be a continuous process based on student's performance in – class tests, assignments, homework, subject seminars, quizzes, laboratory books and their interaction and attendance for theory and lab sessions as applicable.

Course Code	Theory Course Name	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE	ISE	ICA	
CS421	Professional Elective-IV	3			3	70	30		100
CS422	Cyber Laws and Ethics	2			2	50			50
	Sub Total	**5**			**5**	**120**	**30**		**150**
	Laboratory/Workshop					**ESE**			
						POE			
CS423	Project			20	10	100		100	200
	Sub Total			**20**	**10**	**100**			**200**
	Grand Total	**5**		**10**	**15**	**220**	**30**	**100**	**350**

Professional Elective-IV :
Parallel Architecture
Blockchain Technology
Image Processing

Note:

1. Batch size for the practical /tutorial shall be of 15 students. On forming the batches, if the strength of remaining students exceeds 7, then a new batch shall be formed.
2. Appropriate Professional Elective IV Subjects may be added when required.
3. Project group for Final Year B.Tech. (Information Technology) Semester VIII shall not be of more than **five** students.
4. ICA assessment shall be a continuous process based on student's performance in – class tests, assignments, homework, subject seminars, quizzes, laboratory books and their interaction and attendance for theory and lab sessions as applicable

Calculations of Credits

B. Tech. (Computer Science & Engineering) Regular Course

Semester	Total Credits
I	24
II	23
III	23
IV	20
V	20
VI	23
VII	22
VIII	15
Total	**170**