Punyashlok Ahilyadevi Holkar Solapur University, Solapur

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

Name of the Faculty: Science &Technology

(As per New Education Policy 2020)

Structure: Computer Science & Engineering

Name of the Course: F.Y. B. Tech. to Final Y. B. Tech.

(Syllabus to be implemented from June 2023)

Semester I (Common for All Engineering Branches)

Course Type	Course Code	Name of the Course	Engagement Hours		Credits	FA	SA		Total
			L	P		ESE	ISE	ICA	
BSC	BS-01/ BS-02	Engineering Physics / Engineering Chemistry $	3	2	4	70	30	25	125
	BS-03	Engineering Mathematics-I	3	2	4	70	30	25	125
ESC	ES-01/ ES-02	Basics of Civil and Mechanical Engineering / Basic Electrical & Electronics Engineering $	3	2	4	70	30	25	125
	ES-03	Engineering Mechanics	3	2	4	70	30	25	125
AEC	AE-01	Communication Skills	1	2	2		25	25	50
CC	CC-01	Sports and Yoga or NSS/NCC/UBA (Liberal Learning Course-I)	1	2	2			25	25
SEC	SE-01	Workshop Practices		2	1			25	25
		Total	**14**	**14**	**21**	**280**	**145**	**175**	**600**
		Student Induction Program**							

Semester II (Common for All Engineering Branches)

Course Type	Course Code	Name of the Course	Engagement Hours		Credits	FA	SA		Total
			L	P		ESE	ISE	ICA	
BSC	BS-01/ BS-02	Engineering Physics / Engineering Chemistry $	3	2	4	70	30	25	125
	BS-04	Engineering Mathematics - II	3	2	4	70	30	25	125
ESC	ES-01/ ES-02	Basics of Civil and Mechanical Engineering / Basic Electrical & Electronics Engineering $	3	2	4	70	30	25	125
		Engineering Graphics and CAD		4	2		25	50	75
SEC	SE-02	Data Analysis and Programming Skills	1	2	2		25	25	50
CC	CC-02	Professional Personality Development (Liberal Learning Course-II)	1	2	2		25	25	50
IKS	IKS-01	Introduction to Indian Knowledge System	2		2		25	25*	50
		Total	13	14	20	210	190	200	600
		Democracy, Elections and Good Governance *	1			50			

*For IKS activity report should be submitted
BSC- Basic Science Course   ESC- Engineering Science Course,   PCC- Programme Core Course,
AEC- Ability Enhancement Course,   IKS- Indian Knowledge System,   CC- Co-curricular Courses,
VSEC-Vocational and Skill Enhancement Course

● Legends used–

L	Lecture	FA	Formative Assessment
T	Tutorial	SA	Summative Assessment
P	Lab Session	ESE	End Semester Examination
		ISE	In Semester Evaluation
		ICA	Internal Continuous Assessment

Notes-
1. $ - Indicates approximately half of the total students at F. Y. will enroll under Group A and remaining will enroll under Group B.

   Group A will take up course of Engineering Physics (theory & laboratory) in Semester I and will take up course of Engineering Chemistry (theory & laboratory) in semester II.

   Group B will take up course of Engineering Chemistry (theory & laboratory) in Semester I and will take up course of Engineering Physics (theory & laboratory) in semester II.

2. # - For the Course (C113) Basic Electrical & Electronics Engineering, Practicals of Basic Electrical Engineering and Basic Electronics Engineering will be conducted in alternate weeks.

3. @ - For the Course (C113) Basics of Civil and Mechanical Engineering, Practicals of Basics of Civil Engineering and Basics of Mechanical Engineering will be conducted in alternate weeks.

4. In Semester Evaluation (ISE) marks shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level.
   Internal Continuous Assessment Marks (ICA) is calculated based upon student's performance during

laboratory sessions / tutorial sessions.

5. *- Democracy, Elections & Good Governance is mandatory course. The marks earned by student with this course shall not be considered for calculation of SGPA/CGPA. However, student must complete End Semester Examination (ESE) of 50 marks (as prescribed by university) for fulfilment of this course. This course is not considered as a passing head for counting passing heads for ATKT. However, student must pass this subject for award of the degree.

6. Student must complete induction program of minimum five days before commencement of the regular academic schedule at the first semester.

** GUIDELINES FOR INDUCTION PROGRAM (C119)

New entrants into an Engineering program come with diverse thoughts, mind set and different social, economic, regional and cultural backgrounds. It is important to help them adjust to the new environment and inculcate in them the ethos of the institution with a sense of larger purpose.
An induction program for the new UG entrant students is proposed at the commencement of the first semester. It is expected to complete this induction program before commencement of the regular academic schedule.
Its purpose is to make new entrants comfortable in their new environment, open them up, set a healthy daily routine for them, create bonding amongst the peers as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.
The Induction Program shall encompass (but not limited to) below activity –
   1. Physical Activities
   2. Creative Arts
   3. Exposure to Universal Human Values
   4. Literary Activities
   5. Proficiency Modules
   6. Lectures by Experts / Eminent Persons
   7. Visit to Local Establishments like Hospital /Orphanage
   8. Familiarization to Department

Induction Program Course do not have any marks or credits however performance of students for Induction Program is assessed at institute level using below mandatory criteria –
   1. Attendance and active participation
   2. Report writing

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Semester -III

Distribution	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA				Total
			L	T	P		ESE	ISE	ICA	OE/ POE		
PCC	CSEPCC-01	DiscreteMathematical Structure	3			03	70	30				100
PCC	CSEPCC-02	Computer Graphics	3			03	70	30				100
PCC	CSEPCC-03	Data Structure	3		2	04	70	30	25	25		150
CEP/FP	CSEFP-01	Computer Graphics Lab			2	01			25	25		50
CEP/FP	CSEFP-02	Python Programming			2	01			25	25		50
Entrepreneurship	EM-01	Product Development and Entrepreneurship	1	1		02		50	25			75
OE	OE-01	Open Elective-I	2		2	03	70	30	25			125
MDM	MDM-01	MD Minor-I	2		2	03	70	30	25			125
VEC	VEC-01	Universal Human Values	1		2	02	50*		25			75
		Total	15	1	12	22	400	200	175	75		850
		Environmental Science	1									

*For VEC-based examination to be conducted.

PCC- Programme Core Course, PEC-Programme Elective Course
AEC- Ability Enhancement Course,   IKS- Indian Knowledge System,   CC- Co-curricular Courses,
VSEC-Vocational and Skill Enhancement Course
MDM-Multidisciplinary Minor: It should be selectedfrom other UG Engineering Minor Programme

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Semester -IV

Distribution	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA				Total
			L	T	P		ESE	ISE	ICA	OE/ POE		
PCC	CSEPCC-04	Computer Organization and Architecture	3			03	70	30				100
PCC	CSEPCC-05	Theory of Computation	2	1		03	70	30	25			125
PCC	CSEPCC-06	Computer Network	3		2	04	70	30	25	25		150
SEC	CSESEC-01	Object Oriented Programming using Java	1		2	02			25	25		50
Economic/ Management	EM-02	Project Management and Economics	2		0	02		25	25			50
OE	OE-02	Open Elective-II	2		2	03	70	30	25			125
MDM	MDM-02	MD Minor-II	2		2	03	70	30	25			125
VEC	VEC-02	Professional Ethics	1		2	02	50*		25			75
		Total	**16**	**1**	**10**	**22**	**400**	**175**	**175**	**50**		**800**
		Environmental Science	1				40	10				50

*For VEC-02: MCQ based examination to be conducted.

PCC- Programme Core Course,   PEC-Programme Elective Course

AEC- Ability Enhancement Course,   IKS- Indian Knowledge System,   CC- Co-curricular Courses,
VSEC-Vocational and Skill Enhancement Course

MDM-Multidisciplinary Minor: It should be selectedfrom other UG Engineering Minor Programme

Semester -V

Distribution	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA				Total
			L	T	P		ESE	ISE	ICA	OE/ POE		
PCC	CSEPCC-07	Design And Analysis Of Algorithms	3			03	70	30				100
PCC	CSEPCC-08	Operating System	3		2	04	70	30	25			125
PCC	CSEPCC-09	Database Engineering	3		2	04	70	30	25	25		150
PEC	CSEPEC-01	Programme Elective Course-I	3		2	04	70	30	25			125
AEC	AEC-02	Creativity and Design Thinking	1		2	02	50*		25			75
OE	OE-03	Interdisciplinary Mini Project	1		2	02			25	25		50
MDM	MDM-03	MD Minor-III	2		2	03	70	30	25			125
		Total	**16**		**12**	**22**	**400**	**150**	**150**	**50**		**750**

* For AEC-02: MCQ- based examination to be conducted.
PCC- Programme Core Course,   PEC-Programme Elective Course
AEC- Ability Enhancement Course,   IKS- Indian Knowledge System,   CC- Co-curricular Courses ,
VSEC-Vocational and Skill Enhancement Course
MDM-Multidisciplinary Minor: It should be selectedfrom other UG Engineering Minor Programme

Semester -VI

Distrib ution	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA				Total
			L	T	P		ESE	ISE	ICA	OE/ POE	
PCC	CSEPCC-10	Software Engineering	2			03	70	30			100
PCC	CSEPCC-11	Cloud Computing	2		2	03	70	30	25	25	150
PCC	CSEPCC-12	System software	3		2	04	70	30	25		125
PEC	CSEPEC-02	ProgrammeElective Course-II	3		2	04	70	30	25	25	150
PEC	CSEPEC-03	ProgrammeElective Course-III	3	1		04	70	30	25		125
SEC	CSESEC-02	Projects on Industrial Application			4	02			25	50	75
MDM	MDM-04	MD Minor-IV	2		2	03	70	30	25		125
		Total	**15**	**1**	**12**	**22**	**420**	**180**	**150**	**100**	**850**

PCC- Programme Core Course,   PEC-Programme Elective Course
AEC- Ability Enhancement Course,   IKS- Indian Knowledge System,   CC- Co-curricular Courses ,
VSEC-Vocational and Skill Enhancement Course
MDM-Multidisciplinary Minor: It should be selectedfrom other UG Engineering Minor Programme

Semester -VII

Distribution	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA				Total
			L	T	P		ESE	ISE	ICA	OE/ POE	
PCC	CSEPCC-13	Artificial Intelligence and Machine Learning	3			03	70	30			100
PCC	CSEPCC-14	Information And Cyber Security	2		2	03	70	30	25		125
PEC	CSEPEC-04	Project Elective Course-IV or MOOCS##	4			04	100				100
Project	CSEProject	Capstone Project			8*	04			100	100	200
RM	RM	Research Methodology and IPR	3		2	04	70	30	25		125
MDM	MDM-05	MD Minor-V	2			02	70	30			100
		Total	14		12	20	380	120	150	100	750

Students should attend MOOCS in that 4hrs, if MOOCS is chosen, Mini Project/ Assignment related to MOOCS and ICA marks to be given based on that.

PCC- Programme Core Course,   PEC-Programme Elective Course
AEC- Ability Enhancement Course,   IKS- Indian Knowledge System,   CC- Co-curricular Courses,
VSEC-Vocational and Skill Enhancement Course
MDM-Multidisciplinary Minor: It should be selectedfrom other UG Engineering Minor Programme

*Load based on the project groups

List of MOOCS courses related to CSEPEC-04 will be provided by BOS time to time.

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Semester -VIII

Distribution	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA				Total
			L	T	P		ESE	ISE	ICA	OE/ POE		
PCC	CSEPCC-10	Data Science	4#			04	100					100
PEC	CSEPEC-05	Self learning offered by Institute / MOOC Courses	4#			04	100					100
OJT	CSEOJT	On-Job Training			24	12			200	100		300
		Total	**8**		**24**	**20**	**200**		**200**	**100**		500

Students will practice or attend in Self-Learning mode.
PCC- Programme Core Course,   PEC-Programme Elective Course
AEC- Ability Enhancement Course,   IKS- Indian Knowledge System,   CC- Co-curricular Courses,
VSEC-Vocational and Skill Enhancement Course

List of MOOCS courses related to CSEPEC-05 will be provided by BOS time to time.

Basket of Programme Elective Course (PEC)

PEC/Sem	Course code and name
CSEPEC - 01/ V	CSEPEC–01A:SoftwareTestingAndQualityAssurance CSEPEC– 01B: Human Computer Interface CSEPEC – 01C: Mobile Computing CSEPEC–01D:ObjectOriented Modeling and Design
CSEPEC - 02/ VI	CSEPEC – 02A: Data Mining CSEPEC– 02B: Network Security CSEPEC–02C: AdvancedOperatingSystem CSEPEC – 02D: Management Information System
CSEPEC - 03/ VI	CSEPEC – 03A: Internet of Things CSEPEC – 03B: Big Data Analytics CSEPEC–03C:ArtificialNeuralNetwork
CSEPEC - 04/ VII OR	CSEPEC–04A:DevOps CSEPEC – 04B:Business Intelligence CSEPEC–04C:Distributed Systems
CSEPEC - 04/ VII	MOOC Courses offered by NPTEL/SWAYAM CSEPEC – 04D : <As per the list provided by BoS> CSEPEC – 04E : <As per the list provided by BoS>
CSEPEC - 05/ VIII	MOOC Courses offered by NPTEL/SWAYAM CSEPEC – 05E: <As per the list provided by BoS> CSEPEC – 05F: <As per the list provided by BoS>

A. Multidisciplinary Minor in "Artificial Intelligence & Data Science"

Semester	Course Code	Course Title
III	CSEMDM-01A	Programming basics using Python
IV	CSEMDM-02A	Data Pre-processing& Visualization
V	CSEMDM-03A	Machine Learning
VI	CSEMDM-04A	Predictive Analytics
VII	CSEMDM-05A	Artificial Intelligence

B. Multidisciplinary Minor in "Software Engineering"

Semester	Course Code	Course Title
III	CSEMDM-01B	Software Engineering
IV	CSEMDM-02B	Software Testing and Quality Assurance
V	CSEMDM-03B	Object Oriented Modelling and Design
VI	CSEMDM-04B	Management Information System
VII	CSEMDM-05B	Information Retrieval

A. Honors in Artificial Intelligence and Machine Learning

Semester	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA			Total
			L	T	P		ESE	ISE	ICA	
III	CSEHON-01A	Machine Learning	3	1		4	70	30	25	125
IV	CSEHON-02A	Reinforcement Learning	3		2	4	70	30	25	125
V	CSEHON-03A	Natural Language Processing	3		2	4	70	30	25	125
VI	CSEHON-04A	Deep Learning	3		2	4	70	30	25	125
VII	CSEHON-05A	Mini Project			4*	2			50	50
		Total	12	1	10	18	280	120	150	550

*indicates contact hours

FA   Formative Assessment

SA   Summative Assessment

B.Honors in Cyber Security

Semester	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA			Total
			L	T	P		ESE	ISE	ICA		
III	CSEHON-01B	Cryptography	3	1		4	70	30	25		125
IV	CSEHON-02B	Network Security and Secure Coding	3		2	4	70	30	25		125
V	CSEHON-03B	Cyber forensic	3		2	4	70	30	25		125
VI	CSEHON-04B	Information Auditing and Monitoring	3		2	4	70	30	25		125
VII	CSEHON-05B	Mini Project			4*	2			50		50
		Total	**12**	**1**	**10**	**18**	**280**	**120**	**150**		**550**

*indicates contact hours

C. Honors in Data Science

Semester	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA			Total
			L	T	P		ESE	ISE	ICA		
III	CSEHON-01C	Mathematics for Data Science	3	1		4	70	30	25		125
IV	CSEHON-02C	Data Pre-processing& Visualization	3		2	4	70	30	25		125
V	CSEHON-03C	Machine Learning	3		2	4	70	30	25		125
VI	CSEHON-04C	Predictive Analytics	3		2	4	70	30	25		125
VII	CSEHON-05C	Mini Project			4*	2			50		50
		Total	**12**	**1**	**10**	**18**	**280**	**120**	**150**		**550**

*indicates contact hours

Honors with Research*

Semester	Course Code	Name of the Course	Engagement Hours P	Credits	SA ICA	SA OE	Total
VII	CSERES-01	Research Project Phase-01	9 #	9	100	100	200
VIII	CSERES-01	Research Project during OJT	9 ##	9	100	100	200
		Total	18	18	200	200	400

#Along with 9 hours of engagement hours, 4.5 Hrs. activities for preparation for community engagement and service, preparation of reports, etc.

Along with 9 hours of engagement hours 4.5 Hrs. activities for preparation for community engagement and service, preparation of reports,etc. and independent reading during On Job Training and preferably related to On Job Training activities.