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: Electronics & Computer Engineering

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

(The syllabus to be implemented from June 2025)

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

FACULTY OF SCIENCE & TECHNOLOGY

NEP 2020 Compliant Curriculum

With effect from 2024-2025

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 the remaining will enroll under Group B.

   Group A will take up a 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 a 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, Practical's 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, Practical's 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

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE & TECHNOLOGY
NEP 2020 Compliant Curriculum
With effect from 2025-2026

Semester -III

Distribution	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*			*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	*OE/ POE*	
PCC	ECEPCC-01	Fundamentals Of Digital Techniques	3			03	70	30			100
PCC	ECEPCC-02	Data Structures and Algorithms	3			03	70	30			100
PCC	ECEPCC-03	Electronic Devices and Circuit	3		2	04	70	30	25	25	150
CEP/FP	ECEFP-01	Python & Data Structures Programming			2	01			25	25	50
CEP/FP	ECEFP-02	Fundamentals Of Digital Techniques Practical's			2	01			25	25	50
Entrepreneurship	EM-01	Product Development and Entrepreneurship	2			02		50	25		75
OE	OE-01	Open Elective-I	2		2	03	70	30	25		125
MDM	ECEMDM-01	ECE MD Minor-I	2		2	03	70	30	25		125
VEC	VEC-01	Universal Human Values	1		2	02	50*		25		75
		Total	**16**	**0**	**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 selected from another UG Engineering Minor Programme

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE & TECHNOLOGY
NEP 2020 Compliant Curriculum
With effect from 2025-2026

Semester -IV

Distribution	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*			*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	*OE/ POE*	
PCC	ECEPCC-04	Computer Architecture and Organization	3			03	70	30			100
PCC	ECEPCC-05	Network Theory and Linear Integrated Circuits	3		2	04	70	30	25		125
PCC	ECEPCC-06	Object Oriented Programming	3		2	04	70	30	25	25	150
SEC	ECESEC-01	PCB Design Lab			2	01			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	ECEMDM-02	ECE MD Minor-II	2		2	03	70	30	25		125
VEC	VEC-02	Professional Ethics	1		2	02	50*		25		75
		Total	**16**		**12**	**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 selected from other UG Engineering Minor Programme

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE & TECHNOLOGY
NEP 2020 Compliant Curriculum
With effect from 2026-2027

Semester -V

Distribution	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*			*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	*OE/ POE*	
PCC	ECEPCC-07	Analog and Digital Communication	3			03	70	30			100
PCC	ECEPCC-08	8085 Microprocessors and Peripherals	3		2	04	70	30	25		125
PCC	ECEPCC-09	Operating Systems	3		2	04	70	30	25	25	150
PEC	ECEPEC-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	ECEMDM-03	ECE 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

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE & TECHNOLOGY
NEP 2020 Compliant Curriculum
With effect from 2026-2027

Semester -VI

Distribution	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*			*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	*OE/ POE*	
PCC	ECEPCC-10	Software Testing	2			02	70	30			100
PCC	ECEPCC-11	Database Management System	2		2	03	70	30	25	25	150
PCC	ECEPCC-12	Microcontrollers and Applications	3		2	04	70	30	25		125
PEC	ECEPEC-02	Programme Elective Course-II	3		2	04	70	30	25	25	150
PEC	ECEPEC-03	Programme Elective Course-III	3	1		04	70	30	25		125
SEC	ECESEC-02	Projects on Industrial Application			4	02			25	50	75
MDM	ECEMDM-04	ECE 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 selected from other UG Engineering Minor Programme

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE & TECHNOLOGY
NEP 2020 Compliant Curriculum
With effect from 2027-2028

Semester -VII

Distribution	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*			*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	*OE/ POE*	
PCC	ECEPCC-13	Computer Networks	3			03	70	30			100
PCC	ECEPCC-14	Web Development	2		2	03	70	30	25		125
PEC	ECEPEC-04	Project Elective Course-IV or MOOCS##	4			04	100				100
Project	ECE Project	Capstone Project			8*	04			100	100	200
RM	RM	Research Methodology and IPR	3		2	04	70	30	25		125
MDM	ECEMDM-05	ECE 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 selected from another UG Engineering Minor Programme

*Load based on the project groups

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

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF SCIENCE & TECHNOLOGY
NEP 2020 Compliant Curriculum
With effect from 2027-2028

Semester -VIII

Distribution	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*			*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	*OE/ POE*	
PCC	ECEPCC-10	Self -Learning Mode and online or MOOCs	4#			04	100				100
PEC	ECEPEC-05	Professional Elective Course (Option of NPTEL)	4#			04	100				100
OJT	**OJT**	**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

A list of MOOCS courses related to ECEPEC-05 will be provided by BOS from time to time.

Basket of Programme Elective Course (PEC)

PEC/Sem	Course code and name
ECEPEC - 01/ V	ECEPEC –01A: **Basics of Artificial Intelligence** ECEPEC – 01B: **Python for Data Science** ECEPEC – 01C: **VLSI Design** ECEPEC – 01D: **Digital Signal Processing**
ECEPEC - 02/ VI	ECEPEC – 02A: **Machine Learning** ECEPEC – 02B: **Network Security** ECEPEC --02C: **System Design using Arduino & Raspberry Pi** ECEPEC – 02D: **Digital Image Processing**
ECEPEC - 03/ VI	ECEPEC – 03A: **Deep Learning** ECEPEC – 03B: **Data Visualization (Power BI/Tableau)** ECEPEC – 03C: **Electronic System Design** ECEPEC – 03D: **Computer Vision**
ECEPEC - 04/ VII	ECEPEC – 04A: **Data Integration and Management (Informatica 10.x)** ECEPEC – 04B: **Mobile Application Development using Android** ECEPEC – 04C: **Industrial Electronics** ECEPEC – 04D: **Satellite Communication** **OR** MOOC Courses offered by NPTEL/SWAYAM ECPEC – 04E: <As per the list provided by BoS> ECEPEC – 04F: <As per the list provided by BoS>
ECEPEC - 04/ VIII	ECEPEC – 05A: **Data Science** ECEPEC – 05B: **Cyber Security** ECEPEC – 05C: **Internet of Things** ECEPEC – 05D: **5G Communication** **OR** MOOC Courses offered by NPTEL/SWAYAM ECEPEC – 05E: <As per the list provided by BoS> ECEPEC – 05F: <As per the list provided by BoS>

A. Multidisciplinary Minor in "Advanced Embedded Systems:"

Semester	Course Code	Course Title
III	ECEMDM-01A	Fundamentals Of Digital Circuits
IV	ECEMDM-02A	Microprocessors and Peripherals
V	ECEMDM-03A	Microcontrollers and Applications
VI	ECEMDM-04A	Internet Of Things (IoT)
VII	ECEMDM-05A	System Design Using Raspberry Pi

B. Multidisciplinary Minor in "Artificial Intelligence"

Semester	Course Code	Course Title
III	ECEMDM-01B	Fundamentals of Artificial Intelligence
IV	ECEMDM-02B	Fundamentals of Machine Learning
V	ECEMDM-03B	Fundamentals of Deep Learning
VI	ECEMDM-04B	Data Visualization Tools (Tableau & Power BI)
VII	ECEMDM-05B	Data Science

A. Honors in AI TECHNOLOGY:

Semester	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA		Total
			L	T	P		ESE	ISE	ICA	
III	ECEHON-01A	Computational Statistics	3	1		4	70	30	25	125
IV	ECEHON-02A	Python for AI	3		2	4	70	30	25	125
V	ECEHON-03A	Soft computing	3		2	4	70	30	25	125
VI	ECEHON-04A	AI Applications	3		2	4	70	30	25	125
VII	ECEHON-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 the INTERNET OF THINGS (IOT) AND SMART SYSTEMS:

Semester	Course Code	Name of the Course	Engagement Hours			Credits	FA	SA		Total
			L	T	P		ESE	ISE	ICA	
III	ECEHON-01B	IoT architecture and protocols.	3	1		4	70	30	25	125
IV	ECEHON-02B	Sensors, actuators and embedded systems	3		2	4	70	30	25	125
V	ECEHON-03B	Cloud computing for IoT applications	3		2	4	70	30	25	125
VI	ECEHON-04B	IoT security and privacy	3		2	4	70	30	25	125
VII	ECEHON-05B	Applications in healthcare, agriculture and smart cities			4*	2			50	50
		Total	**12**	**1**	**10**	**18**	**280**	**120**	**150**	**550**

*indicates contact hours

C. Honors in Railway Engineering:

Semester	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*		*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	
III	ECEHON-01C	Railway Engineering: A Beginner's Perspective	3	1		4	70	30	25	125
IV	ECEHON-02C	Data Communication and Signaling in Railway	3		2	4	70	30	25	125
V	ECEHON-03C	Applications of IT and Control Engineering in Railway	3		2	4	70	30	25	125
VI	ECEHON-04C	Advanced Communication and Modern Signaling in Railway	3		2	4	70	30	25	125
VII	ECEHON-05C	Mini Project			4*	2			50	50
		Total	**12**	**1**	**10**	**18**	**280**	**120**	**150**	**550**

*Indicates contact hours

D. Honors in RENEWABLE ENERGY AND POWER ELECTRONICS:

Semester	*Course Code*	*Name of the Course*	*Engagement Hours*			*Credits*	*FA*	*SA*		*Total*
			L	*T*	*P*		*ESE*	*ISE*	*ICA*	
III	ECEHON-01D	Solar and wind energy systems	3	1		4	70	30	25	125
IV	ECEHON-02D	Advanced power converters and inverters	3		2	4	70	30	25	125
V	ECEHON-03D	Grid integration and smart grids	3		2	4	70	30	25	125
VI	ECEHON-04D	AI in renewable energy optimization	3		2	4	70	30	25	125
VII	ECEHON-05D	Mini Project			4*	2			50	50
		Total	**12**	**1**	**10**	**18**	**280**	**120**	**150**	**550**

*Indicates contact hours

E. **Honors with Research***

Semester	*Course Code*	*Name of the Course*	*Engagement Hours*	*Credits*	*SA*		*Total*
			P		*ICA*	*OE*	
VII	ECERES-01	Research Project Phase-01	9 #	9	100	100	200
VIII	ECERES-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.

These Courses are open for students of all the UG Engineering Program.

Semester: III List of open electives - I

Sr. No.	List of Open Electives
1.	OE-01A: Advanced Mathematics and Statistics
2.	OE-01B Digital Marketing and E- Commerce
3.	OE-01C Humanities and Social Sciences
4.	OE-01D Industrial and Quality Management
5.	OE-01E Mathematics for Software and Hardware
6.	OE-01F Soft Skills and Personality Development

Semester: IV List of open electives – II

Sr. No.	List of Open Electives
1.	OE-02A Entrepreneurship and Innovation
2.	OE-02B Environmental Sustainability
3.	OE-02C Renewable Energy
4.	OE-02 D Measurement, Instrumentation and Sensors
5.	OE-02E Operation Research
6..	OE-02F Computational Mathematics
7.	OE-02 G Professional Business Communication