Punyashlok Ahilyadevi Holkar Solapur University,Solapur

Name of the Faculty: Science&Technology

Choice Based Credit System

ELECTRONICS & TELECOMMUNICATION ENGINEERING

Structure for

S.Y. B.Tech (Electronics & Telecommunication Engineering) w.e.f.

Academic Year 2021-22

T.Y. B.Tech (Electronics & Telecommunication Engineering) w.e.f.

Academic Year 2022-23

Final Year B.Tech (Electronics & Telecommunication Engineering) w.e.f. Academic Year 2023-24

Programme Educational Objectives and Outcomes

A. *Program Educational Objectives*

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

B. *Program Outcomes*

Electronics & Telecommunication 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 with an 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 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

1. **Solid foundation** : Graduates will be able to attain a **solid foundation** in Electronics and Tele-Communication Engineering with an ability to function in multidisciplinary environment.
2. **Techniques and Skills**: Graduates will be able to use **techniques and skills** to design, analyze, synthesize, and simulate Electronics and Communication Engineering components and systems.
3. **Developing Programs:** Graduate will be capable of **developing programs** in Assembly, High level and HDL languages using contemporary tools for software development.

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FACULTY OF SCIENCE & TECHNOLOGY

Credit System structure of S.Y. B.Tech. Electronics & Telecommunication Engineering **W.E.F. 2021-22**

Semester I

Course Code	Theory Course Name	Hrs./week L	Hrs./week T	Hrs./week P	Credits	ISE	ESE	ICA	Total
ET211	Engineering Mathematics – III	3	1	--	4	30	70	25	125
ET212	Electronic Circuit Analysis and Design	3	--	--	3	30	70	25	125
ET213	Network Theory and Analysis	3	--	--	3	30	70	--	100
ET214	Digital Techniques	3	--	--	3	30	70	25	125
ET215	Analog Communication	3	--	--	3	30	70	25	125
	Sub Total	15	1	--	16	150	350	100	600
ENV21	Environmental Science	1	--	--	--	--	--	--	--

Course Code	Laboratory Course Name	L	T	P	Credits	ISE	ESE POE	ESE OE	ICA	Total
ET212	Electronic Circuit Analysis and Design	--	--	2	1	--	50*	--	--	50
ET213	Network Theory and Analysis	--	--	2	1	--	--	--	25	25
ET214	Digital Techniques	--	--	2	1	--	25	--	--	25
ET215	Analog Communication	--	--	2	1	--	25	--	--	25
E216	Electronics Software Lab-I	--	1	2	2	--	--	--	25	25
	Sub Total	--	1	10	6	--	100		50	150
	Grand Total	15	2	10	22	150	450		150	750

Abbreviations: L- Lectures, P –Practical, T- Tutorial, ISE- In Semester Exam, ESE - End Semester Exam, OE-Oral Examination, POE- Practical Oral Examination, ICA- Internal Continuous Assessment, ESE - University Examination (Theory &/ POE &/Oral examination)

 Note: *- Practical and Oral Examination of Electronics Circuit Analysis and Design include some of the practical from Network Theory and Analysis

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Credit System structure of S.Y. B.Tech. Electronics & Telecommunication Engineering **W.E.F. 2021-22**

Semester II

Course Code	Theory Course Name	L	T	P	Credits	ISE	ESE	ICA	Total
ET221	Control System	3	1	_	4	30	70	25	125
ET222	Analog Integrated Circuits	3	_	_	3	30	70	25	125
ET223	Principles of Digital Communication	3	--	--	3	30	70	25	125
ET224	Signals and Systems	3	1	_	4	30	70	25	125
ET225	Data Structures	3	_	_	3	30	70	--	100
	Sub Total	15	2	--	17	150	350	100	600
ENV22	Environmental Science	1	-	--	--	--	--	--	--

Course Code	Laboratory Course Name						POE	OE		
ET222	Analog Integrated Circuits	_	_	2	1	_	25	_	--	25
ET223	Principles of Digital Communication	--	--	2	1	--	25	--	--	25
ET225	Data Structures	_	_	2	1	--	--	--	25	25
ET226	Electronic Software Lab-II	1	--	4	3	_	50	--	25	75
	Sub Total	--	--	10	6	--	100		50	150
	Grand Total	16	2	10	23	150	450		150	750

Abbreviations: L- Lectures, P –Practical, T- Tutorial, ISE- In Semester Exam, ESE - End Semester Exam, OE-Oral Examination, POE- Practical Oral Examination, ICA- Internal Continuous Assessment, ESE - University Examination (Theory &/ POE &/Oral examination).

Note:

1. Student is required to study and pass Environmental Science subject in Second Year to become eligible for award of degree.

2. Batch size for the practical /tutorial shall be of 18 students. On forming the batches, if the strength of remaining students exceeds 9, then a new batch shall be formed.

3. Vocational Training (evaluated at Final Year Part-I) of minimum 15 days shall be completed in any vacation after S.Y. Part-I but before Final Year Part-I & the report shall be submitted and evaluated in Final Year Part-I.

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.

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*Credit System structure of T.Y. B.Tech. Electronics & Telecommunication Engineering **W.E.F. 2022-23***

Semester I

Course Code	Theory Course Name	Hrs./week L	Hrs./week T	Hrs./week P	Credits	ISE	ESE	ICA	Total
ET311	Electromagnetic Field Theory	3	1	--	4	30	70	25	125
ET312	Microcontrollers and Applications	3	--	--	3	30	70	25	125
ET313	Digital Signal Processing	3	-	--	3	30	70	25	125
ET314	Open Elective-I	3	1	--	4	30	70	25	125
SLM31	Self Learning Module–I(HSS Course)	--	--	--	2	--	50	--	50
	Sub Total	12	2	--	16	120	330	100	550

Course Code	Laboratory Course Name	L	T	P	Credits	ISE	ESE POE	ESE OE	ICA	Total
ET312	Microcontrollers and Applications	--	--	2	1	--	50	--	--	50
ET313	Digital Signal Processing	--	--	2	1	--	50	--	--	50
ET315	Electronic Software Lab-III	1	--	4	3	--	50	--	50	100
	Sub Total	--	--	8	5	--	150		50	200
	Grand Total	13	2	8	21	120	480		150	750

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Credit System structure of T.Y. B.Tech..Electronics& Telecommunication Engineering **W.E.F. 2022-23**

Semester II

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme			
		L	T	P		ISE	ESE	ICA	Total
ET321	Antenna & Wave Propagation	3	1	--	4	30	70	25	125
ET322	Embedded System	3	--	--	3	30	70	25	125
ET323	Electronic System Design	3	--	--	3	30	70	25	125
ET324	Professional Elective-I	3	--	--	3	30	70	--	100
ET325	Open Elective-II	3	--	--	3	30	70	--	100
	Sub Total	15	1	--	16	150	350	75	575

Course Code	Laboratory Course Name					ESE			
						POE	OE		
ET322	Embedded System	--	--	2	1	25	--	--	25
ET323	Electronic System Design	--	--	2	1	50	--	--	50
ET324	Professional Elective-I	--	--	2	1	--	--	25	25
ET325	Open Elective-II	--	--	2	1	--	--	25	25
ET327	Mini Project	--	--	2	1	--	25	25	50
	Sub Total	--	--	10	5	--	100	75	175
	Grand Total	15	1	10	21	150	450	150	750

Abbreviations: L- Lectures, P –Practical, T- Tutorial, ISE- In Semester Exam, ESE - End Semester Exam, OE-Oral Examination, POE- Practical Oral Examination, ICA-Internal Continuous Assessment, ESE - University Examination (Theory &/ POE &/Oral examination).

Note –

1. Batch size for the practical /tutorial shall be of 16 students. On forming the batches, if the strength of remaining student exceeds 8, then a new batch shall be formed.

2. Vocational Training (evaluated at Final Year Part-I) of minimum 15 days shall be completed in any vacation after S.Y. Part-I but before Final Year Part-I & the report shall be submitted and evaluated in Final Year Part-I.

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

   - Student shall select & enroll a Self Learning Module I Course from PAH Solapur University, Solapur HSS Course List (SLM31). Student must appear and pass university examination.
   - Curriculum for Humanities and Social Sciences (HSS), Self Learning Module-I is common for all undergraduate engineering programs.
   - Minimum four assignments for Self Learning Module (SLM31) shall be submitted by the students which shall be evaluated by a Module Coordinator assigned by institute/department.

                                        OR

   - Student shall select and enroll for university approved minimum eight weeks MOOC based HSS course (SLM31), and complete its assignments. Student must appear and pass certificate examination conducted through MOOC courses.

4. Open Elective I & II shall be common and open for the students of the branches – Electronics Engineering, Electronics & Telecommunication Engineering and Electrical Engineering. Students of these branches can take any of these Open Electives. Syllabus and university examination question paper will be same for all these branches.

5. Student shall select Professional Elective-I from given course list. Student must appear and pass university examination.

6. Project group for T.Y. B.Tech. - Semester II – Mini Project shall not be of more than three students. This mini project may include simulation and/or Software and/or Hardware. Report of this work should be submitted at the end of semester.

8. ICA assessment shall be a continuous process based on student's performance in class tests, assignments, homework, subject seminars, quizzes, and laboratory books and their interaction and attendance for theory and lab sessions as applicable.

- **List of Open Electives -**

Sr.	Branch Offering Elective	Open Elective I	Open Elective II
1.	Electronics &Telecommunication Engineering	1. Managerial Economics 2. Project Management and Operation Research	1. Sensors and Applications 2. Open Source Technologies
2.	Electronics Engineering	Information Technology & Management	Operating Systems
3.	Electrical Engineering	Business Ethics	Power System Planning

- **List of Professional Elective I–**

    1. Optical Fiber Communication
    2. Image and Video Processing
    3. Multimedia Communication Technology

- **List of Self Learning Modules (HSS Course) (SLM 31)–**

    1. MOOC/University Defined Courses

PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

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Credit System structure of Final Year B.Tech. Electronics & TelecommunicationEngineering W.E.F. 2023-24

Semester I

Course Code	Theory Course Name	L	T	P	Credits	ISE	ESE	ICA	Total
ET411	Microwave Engineering	3	--	--	3	30	70	25	125
ET412	Data Communication	3	--	--	3	30	70	25	125
ET413	VLSI Design	3	--	--	3	30	70	25	125
ET414	Professional Elective-II	3	1	--	4	30	70	25	125
ET415	Research Methodology	3	--	--	3	30	70	25	125
	Sub Total	15	1	--	16	150	350	125	625

Course Code	Laboratory Course Name	L	T	P	Credits	ISE	ESE POE	ESE OE	ICA	Total
ET411	Microwave Engineering	--	--	2	1	--	--	25	--	25
ET412	Data Communication	--	--	2	1	--	25	--	--	25
ET413	VLSI Design	--	--	2	1	--	25	--	--	25
ET416	Project Phase-I	_	_	4	2	_	_	--	25	25
ET417	Vocational Training	--	--	--	1	--	--	--	25	25
	Sub Total	--	-	10	6	--	75		50	125
	Grand Total	**15**	**1**	**10**	**22**	**150**	**425**		**175**	**750**

Abbreviations: L- Lectures, P –Practical, T- Tutorial, ISE- In Semester Exam, ESE - End Semester Exam, OE- Oral Examination, POE- Practical Oral Examination, ICA-Internal Continuous Assessment, ESE - University Examination (Theory &/ POE &/Oral examination)

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Credit System structure of Final Year B.Tech. Electronics & Telecommunication Engineering W.E.F. 2023-24

Semester II

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme			
		L	T	P		ISE	ESE	ICA	Total
ET421	Professional Elective-III	--	--	--	2	--	50	--	50
SLM41	Self Learning Module–II (Professional Course)	--	--	--	2	--	50	--	50
Sub Total		--	--	--	4	--	100	--	100
Course Code	*Laboratory Course Name*								
							ESE		
							POE	OE	
ET421	Project Phase-II (Capstone Project / Internship)	--	--	20	10	--	--	100	100	200
Sub Total		--	--	--	10	--	100		100	200
Grand Total			-	20	**14**	**--**	**200**		**150**	**300**

 Note –

1. Batch size for the practical /tutorial shall be of 15 students. On forming the batches, if the strength of remaining students exceeds 8, then a new batch shall be formed.

2. Vocational Training (evaluated at Final Year Part-I) of minimum 15 days shall be completed in any vacation after S.Y. Part-I but before Final Year Part-I & the report shall be submitted and evaluated in Final Year Part-I.

3. Project group for Final Year (Electronics & Telecommunication Engineering) Part I and Part II shall not be of more than **three** 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.
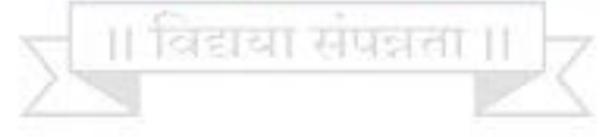
5. Self-Learning Module II at Final Year B.Tech. – Semester II

- Student shall select a Self Learning Module II (Professional Course) from Course List (SLM 41). Student must appear and pass university examination.

- Minimum four assignments for Self Learning Modules (SLM 41) shall be submitted by the students which shall be evaluated by a Module Coordinator assigned by institute / department.

<div align="center">OR</div>

- Student can select & enroll for university approved minimum eight week technical course from various MOOC technical courses, and complete its assignments. Student must appear and pass certificate examination conducted by MOOC courses.

6. Student shall select Professional Elective-II and III from course list. Student must appear and pass university examination.

7. In Project phase-I students shall select Sponsored / Industry oriented / In –House projects which should cover Literature survey, Problem statement finalization, and Synopsis submission of proposed work. Student shall submit hard copy of synopsis only after delivering seminar.

8. Project phase-II can be Capstone project/Internship which shall be the implementation of the problem statement decided as in phase-I. A hard copy of the final report shall be submitted to the department after successfully completion of project

- Student can carry out project phase II as sponsored/In House project

<div align="center">OR</div>

- Student can avail semester long internship/ apprentice/ industrial training and the report submitted by student will be accepted as the project work only if, project guide accepts this work and examination panel approves the same. (Student should continuously report their work to the project guide and should be periodically evaluated by the internal examiners at college level)

|| विद्याचा संपन्नता ||

- **List of Professional courses–**

Sr. No	B.Tech part I Professional Elective-II	B.Tech part II Professional Elective-III
1	PLC and Industrial Controllers	Wireless Sensor Networks
2	Mobile Communication	Satellite Communication
3	DSP Processor and application	Software Defined Radio

- **Self Learning Module-II**

  1. Electric Vehicles
  2. Mechatronics
  3. Biomedical Instrumentation
  4. MOOC / University Defined Courses