

**Punyashlok Ahilyadevi Holkar Solapur University, Solapur**



**Name of the Faculty: Science & Technology**  
**CHOICE BASED CREDIT SYSTEM**

**Syllabus: Electrical Engineering**

**Syllabus Structure**

**S.Y. B.Tech (Electrical Engineering) w. e. f. Academic Year 2019-20**  
**T.Y. B.Tech (Electrical Engineering) w. e. f. Academic Year 2020-21**  
**Final Year B.Tech (Electrical Engineering) w. e. f. Academic Year 2021-22**

# **Punyashlok Ahilyadevi Holkar Solapur University, Solapur**

## **FACULTY OF ENGINEERING & TECHNOLOGY Electrical Engineering**

### **PROGRAMME: BACHELOR OF ELECTRICAL ENGINEERING PROGRAMME OBJECTIVES**

#### **A. PROGRAM EDUCATIONAL OBJECTIVES**

##### **A. Program Educational Objectives**

- 1) To develop an ability to understand the basic concepts of fundamental laws in electrical circuits and their applications in the working principle of electrical apparatus.
- 2) To introduce students about the power generation, transmission, distribution and utilization of electrical energy and their controls.
- 3) To develop an application oriented understanding amongst the students about electrical energy utilization.
- 4) To develop an analytical skills amongst the students about electrical systems used in power sector and various industries.

#### **B. PROGRAMME OUTCOMES**

Students attain the following outcomes:-

- a. an ability to apply knowledge of mathematics, science, and engineering
- b. an ability to design and conduct experiments, as well as to analyze and interpret data,
- c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d. an ability to function on multidisciplinary teams
- e. an ability to identify, formulate, and solve engineering problems
- f. an understanding of professional and ethical responsibility
- g. an ability to communicate effectively the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- h. a recognition of the need for, and an ability to engage in life-long learning,
- i. a knowledge of contemporary issues
- j. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**Punyashlok Ahilyadevi Holkar Solapur University, Solapur**  
**Faculty of Engineering & Technology**  
**S.Y. B Tech. (Electrical Engineering)**

*Choice Based Credit System Syllabus Structure of S. Y. B. Tech. Electrical Engineering W.E.F. 2019-2020*

**Semester I**

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme				
		L	T	P		ISE	ESE	ICA	Total	
	Engineering Mathematics-III	2	1		3	30	70	25	125	
	Electrical Machines-I	3	-		3	30	70	-	100	
	Electrical Measurement and Instrumentation	3	-		3	30	70	-	100	
	Power System I	3	1		4	30	70	25	125	
	Electronic Devices and Circuits	2	-		2	30	70	-	100	
	Object Oriented Programming with C++	1	-		1	--	--	-	--	
<b>Sub Total</b>		<b>14</b>	<b>2</b>	<b>-</b>	<b>16</b>	<b>150</b>	<b>350</b>	<b>50</b>	<b>550</b>	
	Environmental Science	1								
<b>Laboratory Course Name</b>										
							ESE			
							POE	OE		
	Electrical Machines-I	-	-	2	1	-	50	-	25	75
	Electrical Measurement and Instrumentation	-	-	2	1	-	50	-	25	75
	Electronic Devices and Circuits	-	-	2	1	-		-	25	25
	Object Oriented Programming with C++	-	-	2	1	-	50	-	25	75
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>8</b>	<b>4</b>		<b>150</b>		<b>100</b>	<b>250</b>
<b>Grand Total</b>		<b>14</b>	<b>2</b>	<b>8</b>	<b>20</b>	<b>150</b>	<b>500</b>	<b>150</b>	<b>800</b>	

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

**Punyashlok Ahilyadevi Holkar Solapur University, Solapur**  
**Faculty of Engineering & Technology**  
**S. Y. B. Tech. (Electrical Engineering)**

*Choice Based Credit System Structure of S. Y. B. Tech. Electrical Engineering W.E.F. 2019-2020*

**Semester II**

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme			
		L	T	P		ISE	ESE	ICA	Total
	Numerical Methods and Linear Algebra	2	1	-	3	30	70	25	125
	Electrical Machines-II	3	-	-	3	30	70	-	100
	Power System II	3	1	-	4	30	70	25	125
	Analog & Digital Integrated circuits	3	-	-	3	30	70	-	100
	Network Analysis	3	-	-	3	30	70	-	100
<b>Sub Total</b>		<b>14</b>	<b>2</b>	<b>-</b>	<b>16</b>	<b>150</b>	<b>350</b>	<b>50</b>	<b>550</b>
	Environmental Science	1	-	-	-	-	-	-	1
<b>Laboratory Course Name</b>									
						ESE			
						POE	OE		
	Electrical Machines-II	-	-	2	1	-	50	-	75
	Network Analysis	-	-	2	1	-	50	-	75
	Analog & Digital Integrated circuits	-	-	2	1	-	-	-	75
	Computer Aided Design and Simulation	-	-	2	1	-	50	-	75
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>8</b>	<b>4</b>	<b>-</b>	<b>150</b>	<b>100</b>	<b>250</b>
<b>Grand Total</b>		<b>14</b>	<b>2</b>	<b>8</b>	<b>20</b>	<b>150</b>	<b>500</b>	<b>150</b>	<b>800</b>

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**Note –**

- Batch size for the SE practical /tutorial shall be of 20 students. On forming the batches, if the strength of remaining student exceeds 9, then a new batch shall be formed.
- Vocational Training (evaluated at B.E. Part-I) of minimum 15 days shall be completed in any vacation after S.E. Part-II but before B.E. Part-I & and evaluated on the basis of presentation as well as training report.
- Student shall select one Self Learning Module at T.E. Part I and T.E. Part II each from Technical and Humanities and Social Sciences Group with at least one Self Learning Module from the Humanities and Social Sciences Group
- Curriculum for Humanities and Social Sciences Self Learning Modules is common for all under graduate programmes of faculty of Engineering and Technology
- Minimum four assignments for Self-Learning Modules at T.E. Part I and T.E. Part II shall be submitted by the students which shall be evaluated by a Module Coordinator assigned by institute / department
- Project group for T.E.(Electrical) Part II Mini Project shall not be of more than three student
- Project group for B.E. (Electrical) Part I and Part II shall not be of more than FOUR students.
- ICA 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

**Punyashlok Ahilyadevi Holkar Solapur University, Solapur**  
**Faculty of Engineering & Technology**  
**T. Y. B. Tech. (Electrical Engineering)**

*Choice Based Credit System Syllabus Structure of T. Y. B. Tech. Electrical Engineering W.E.F. 2020-2021*

**Semester I**

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme				
		L	T	P		ISE	ESE	ICA	Total	
	Power System III	3	-	-	3	30	70	-	100	
	Control System-I	3	-	-	3	30	70	-	100	
	Microprocessor and Microcontroller	3	-	-	3	30	70	-	100	
	Engineering Economics and Management	2	1	-	3	30	70	25	125	
	Electromagnetic Engineering	3	1	-	4	30	70	25	125	
	Self-Learning Module-I			-	2		50		50	
<b>Sub Total</b>		<b>14</b>	<b>2</b>	<b>-</b>	<b>18</b>	<b>150</b>	<b>400</b>	<b>50</b>	<b>600</b>	
<b>Laboratory Course Name</b>										
						ESE				
						POE	OE			
	Power System III	-	-	2	1	-	-	25	25	50
	Control System-I	-	-	2	1	-	-	25	25	50
	Microprocessor and Microcontroller	-	-	2	1	-	50	-	25	75
	Electrical Workshop	-	-	2	1	-	-	-	25	25
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>8</b>	<b>4</b>	<b>-</b>	<b>100</b>	<b>100</b>	<b>200</b>	
<b>Grand Total</b>		<b>14</b>	<b>2</b>	<b>8</b>	<b>22</b>	<b>150</b>	<b>500</b>	<b>150</b>	<b>800</b>	

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**Punyashlok Ahilyadevi Holkar Solapur University, Solapur**  
**Faculty of Engineering & Technology**  
**T. Y. B. Tech. (Electrical Engineering)**

*Choice Based Credit System Structure of T. Y. B. Tech. Electrical Engineering W.E.F. 2021-2022*

**Semester II**

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme			
		L	T	P		ISE	ESE	ICA	Total
	Electrical Utilization	3	1	-	4	30	70	25	125
	Power Electronics	3	-	-	3	30	70	-	100
	Control System-II	3	-	-	3	30	70	-	100
	Signals and Systems	2	1	-	3	30	70	25	125
	Electrical Machine Design	3	-	-	3	30	70	-	100
	Self-Learning Module-II	-	-	-	2	--	50	-	50
<b>Sub Total</b>		<b>14</b>	<b>2</b>	<b>-</b>	<b>18</b>	<b>150</b>	<b>400</b>	<b>50</b>	<b>600</b>
<b>Laboratory Course Name</b>									
							ESE		
							POE	OE	
	Power Electronics	-	-	2	1	-	50	-	25
	Control System-II	-	-	2	1	-	-	25	25
	Electrical Machine Design	-	-	2	1	-	--	25	25
	Mini Hardware Project	-	-	2	1	-	-	--	25
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>8</b>	<b>4</b>	<b>-</b>	<b>100</b>	<b>100</b>	<b>200</b>
<b>Grand Total</b>		<b>14</b>	<b>2</b>	<b>8</b>	<b>22</b>	<b>150</b>	<b>500</b>	<b>150</b>	<b>800</b>

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**Self-Learning Module-II:**

1. Special Purpose Machines      2) Electrical Safety      3)Solar Photovoltaic System Design & Installation      4) NPTEL Courses

**Note –**

- Batch size for the TE 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.
- Vocational Training (evaluated at B.E. Part-I) of minimum 15 days shall be completed in any vacation after S.E. Part-II but before B.E. Part-I & and evaluated on the basis of presentation as well as training report.
- Student shall select one Self Learning Module at T.E. Part I and T.E. Part II each from Technical and Humanities and Social Sciences Group with at least one Self Learning Module from the Humanities and Social Sciences Group
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**Faculty of Engineering & Technology**  
**B.Tech (Electrical Engineering)**

*Choice Based Credit System Syllabus Structure of Final Year B. Tech. Electrical Engineering W.E.F. 2022-2023*

*Semester I*

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme				
		L	T	P		ISE	ESE	ICA	Total	
	Industrial Drives Control	3	-	-	3	30	70	-	100	
	Power System and Operation Control	2	1	-	3	30	70	25	125	
	Programmable Logic Control and SCADA	3	-	-	3	30	70	-	100	
	Switchgear and Protection	3	-	-	3	30	70	-	100	
	Elective-I	2	1	-	3	30	70	25	125	
<b>Sub Total</b>		<b>13</b>	<b>2</b>	<b>-</b>	<b>15</b>	<b>150</b>	<b>350</b>	<b>50</b>	<b>550</b>	
<b>Laboratory Course Name</b>										
							ESE			
							POE	OE		
	Industrial Drives Control	-	-	2	1	-	50	-	25	75
	Programmable Logic Control and SCADA	-	-	2	1	-	-	-	25	25
	Switchgear and Protection	-	-	2	1	-	-	25	25	50
	Seminar on Industrial Training	-	-	-	-	-	-	-	25	25
	Project Phase-I	-	-	4	2	-	-	50	25	75
<b>Sub Total</b>		<b>--</b>	<b>-</b>	<b>10</b>	<b>5</b>	<b>-</b>	<b>125</b>		<b>125</b>	<b>250</b>
<b>Grand Total</b>		<b>13</b>	<b>2</b>	<b>10</b>	<b>20</b>	<b>150</b>	<b>475</b>		<b>175</b>	<b>800</b>

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**B.Tech (Electrical Engineering)**

*Choice Based Credit System Syllabus Structure of Final Year B. Tech. Electrical Engineering W.E.F. 2022-2023*

**Semester II**

Course Code	Theory Course Name	Hrs./week			Credits	Examination Scheme				
		L	T	P		ISE	ESE	ICA	Total	
	Power Quality & FACTS	3	-	-	3	30	70	-	100	
	Extra High Voltage AC Transmission	3	-	-	3	30	70	25	125	
	Elective -II	2	1	-	3	30	70	-	100	
	Elective III	2	1	-	3	30	70	25	125	
<b>Sub Total</b>		<b>10</b>	<b>-</b>	<b>-</b>	<b>12</b>	<b>120</b>	<b>280</b>	<b>50</b>	<b>450</b>	
<b>Laboratory Course Name</b>										
							<b>ESE</b>			
							<b>POE</b>	<b>OE</b>		
	Power Quality & FACTS	-	-	2	1	-		50	25	75
	Extra high voltage AC transmission			2	1			50	25	75
	Project Phase-II	-	-	8	4	-	100		100	450
<b>Sub Total</b>		<b>-</b>	<b>-</b>	<b>12</b>	<b>6</b>	<b>-</b>	<b>200</b>	<b>150</b>	<b>350</b>	
<b>Grand Total</b>		<b>10</b>	<b>2</b>	<b>12</b>	<b>18</b>	<b>120</b>	<b>480</b>	<b>200</b>	<b>800</b>	

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Elective I		Elective II		Elective III	
Course Code	Course	Course Code	Course	Course Code	Course
	Energy Audit and Management		Power System Planning		Advance Control Engineering
	Digital Signal Processing		Neural Network & Fuzzy Logic		Electrical Estimation and Installation
	Renewable Energy Sources		Advance Electrical Drives		Instrumentation Process Control & Robotics
	High Voltage Engineering		Smart Grid Technology		Power System Dynamics and stability

**Note –**

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