



**Annasaheb Dange College of Engineering and  
Technology, Ashta  
An Autonomous Institute**

## **Curriculum Structure**

**S. Y. B. Tech.  
MECHANICAL ENGINEERING**

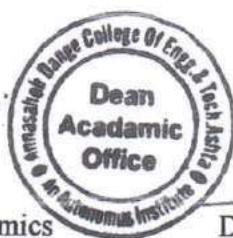
**Academic Year 2018-19**

## Teaching and Evaluation Scheme S.Y.B.Tech. Mechanical Engineering: III Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max.	Min. for Passing	Max.	Min. for Passing
0MEBS201	Applied Mathematics-III	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC202	Engineering Thermodynamics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC203	Fluid Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC204	Manufacturing Processes and Machine Tools	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC205	Machine Drawing	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEES206	Computer Programming Using C++	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEMC207	Environmental Studies	2	--	--	--	ISE	50	GRADE	--	--
0MEPC251	Fluid Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC252	Machine Drawing Laboratory	--	--	2	1	ESE	--	POE	25	10
						ISE	--	--	25	10
						ESE	--	POE	25	10
0MEES253	Computer Programming Using C++ Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC254	Workshop Practice -III	--	--	2	1	ISE	--	--	25	10
0MEHS255	General Proficiency	--	--	2	--	ISE	--	GRADE	--	--
<b>Total</b>		<b>19</b>	<b>01</b>	<b>10</b>	<b>22</b>	<b>Total</b>	<b>650</b>		<b>150</b>	
Total Contact Hours/Week: 30 hrs										
Course Category	HS	BS	ES	PC	PE	OE	PR			
Credits	00	04	03	15	00	00	00			
Cumulative Sum	03	20	32	15	00	00	00			

HOD

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Director

Executive Director

## Teaching and Evaluation Scheme S.Y.B.Tech. Mechanical Engineering: IV Semester

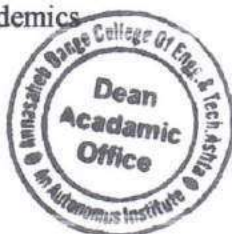
Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max.	Min. for Passing	Max.	Min. for Passing
0MEES208	Applied Numerical Methods	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC209	Mechanics of Materials	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC210	Thermal Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC211	Hydraulic Machines	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC212	Kinematics of Machines	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC213	Materials Science and Metallurgy	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEES257	Numerical Methods using MATLAB Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC258	Hydraulic Machines Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC259	Kinematics of Machines Laboratory	--	--	2	1	ESE	--	POE	25	10
0MEPC260	Materials Science and Metallurgy Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC261	Computer Aided Design Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC262	Workshop Practice -IV	--	--	2	1	ESE	--	POE	25	10
Total		18	--	12	24	Total	600		200	
Total Contact Hours/Week: 30 hrs										
Course Category	HS	BS	ES	PC	PE	OE	PR			
Credits	00	00	04	20	00	00	00			
Cumulative Sum	03	20	36	35	00	00	00			

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SYME-03/25





**Annasaheb Dange College of Engineering and  
Technology, Ashta  
An Autonomous Institute**

**Curriculum Structure**

**T.Y.B. Tech.  
MECHANICAL ENGINEERING**

**SEMESTER V- VI**

**Academic Year: 2019-20**

**Department of Mechanical Engineering**



**Teaching and Evaluation Scheme**

**T.Y.B. Tech: Semester-V**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max.	Min. for Passing	Max.	Min. for Passing
0MEPC301	Design of Machine Elements-I	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPC302	Heat and Mass Transfer	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPC303	Dynamics of Machines	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPC304	Control Engineering	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPC305	Manufacturing Engineering	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPE30*	Professional Elective-I	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPR309	Research Methodology-I	1	--	--	1	MSE	20	20	--	--
					ESE	30	--		--	
0MEPC351	Heat and Mass Transfer Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--	POE	25	10
0MEPC352	Dynamics of Machines Laboratory	--	--	2	1	ISE	--		25	10
						ESE	--	OE	25	10
0MEPC353	Manufacturing Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC354	Computer Aided Manufacturing Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--	POE	25	10
0MEPC355	Workshop Practice -V	--	--	2	1	ISE	--	--	25	10
0MEPR356	Mini Project-I	--	--	1	1	ISE	--	--	50	20
Total		19	--	11	25	Total	650		250	
Total Contact Hours/Week: 30 hrs										
Course Category		HS	BS	ES	PC	PE	OE	PR		
Credits		00	00	00	20	03	00	02		
Cumulative Sum		03	20	36	55	03	00	02		
0MEPE30* Professional Elective-I										
0MEPE306- Advanced Mechanics of Solids			0MEPE307- Advanced Foundry Technology			0MEPE308- Fluid Dynamics				

Head of Department

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**Teaching and Evaluation Scheme  
T.Y. B. Tech: Semester-VI**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory		Practical	
							Max.	Min. for	Max.	Min. for
0MEPC310	Design of Machine Elements-II	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPC311	Mechatronics	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPC312	Industrial Hydraulics and Pneumatics	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPC313	Metrology and Quality Control	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPE31*	Professional Elective-II	3	--	--	3	ISE I	10	40	--	--
					MSE	30	--		--	
					ISE II	10	--		--	
					ESE	50	--		--	
0MEPR317	Research Methodology-II	1	--	--	1	MSE	20	20	--	--
					ESE	30	--		--	
0MEPC357	Mechanical Measurement	--	--	2	1	ISE	--	POE	25	10
0MEPC358	Design of Machine Elements-II Laboratory	--	--	2	1	ESE	--	POE	25	10
0MEPC359	Mechatronics Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--	POE	25	10
0MEPC360	Industrial Hydraulics and Pneumatics Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPE36#	Professional Elective-II Laboratory	--	--	2	1	ISE	--	--	25	10
0MEPC364	Workshop Practice -VI	--	--	2	1	ISE	--	--	25	10
0MEPR365	Mini Project-II	--	--	2	1	ESE	--	--	25	10
0MEPR366	Vocational Training	--	--	--	2	ESE	--	--	25	10
Total		16	00	14	25	Total	550		250	
Total Contact Hours/Week: 30 hrs										
Course Category		HS	BS		ES	PC	PE	OE	PR	
Credits		00	00		00	17	04	00	04	
Cumulative Sum		03	20		36	72	07	00	06	
0MEPE31* Professional Elective-II										
0MEPE314 -FEA		0MEPE315 -Advanced Manufacturing Technology					0MEPE316 -CFD			
0MEPE36# Professional Elective-II Laboratory										
0MEPE361 - FEA		0MEPE362 - Advanced Manufacturing Technology					0MEPE363 - CFD			

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28/1/19  
Head of Department

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Dean Academics

*[Signature]*  
Director

*[Signature]*  
Executive Director







**Annasaheb Dange College of Engineering and  
Technology, Ashta**

**An Autonomous Institute**

**Curriculum Structure**

**B. Tech.  
MECHANICAL ENGINEERING**

**SEM VII – SEM VIII  
w.e.f. 2020-21**

**Department of Mechanical Engineering**



**Teaching and Evaluation Scheme**  
**B. Tech Mechanical Engineering: Sem - VII**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory		Practical	
							Max	Min. for Passing	Max	Min. for Passing
0MEPC401	Refrigeration and Air conditioning	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC402	Internal Combustion Engines	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPE40*	Professional Elective-III	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPE40**	Professional Elective-IV	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEOE4***	Open Elective	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEHS412	Human values and Professional Ethics	1	--	--	1	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC451	Refrigeration and Air conditioning Laboratory	--	--	2	1	ISE	--		25	10
0MEPC452	Internal Combustion Engines Laboratory	--	--	2	1	ESE	--	POE	25	10
0MEPE45#	Professional Elective-IV Laboratory	--	--	2	1	ISE	--		25	10
0MEPR456	Project-I	--	--	6	8	ESE	--	OE	25	10
Total		16	00	12	27	Total	600		200	
Total Contact Hours/Week: 28 hrs										
Course Category	HS	BS	ES	PC	PE	OE	PR			
Credits	01	00	00	08	07	03	08			
Cumulative Sum	04	16	40	81	14	03	14			
0MEPE40* Professional Elective-III										
0MEPE403- Mechanical System Design		0MEPE404- Advanced Welding Engineering			0MEPE405- Design of thermal System & Optimization					
0MEPE40** Professional Elective-IV										
0MEPE406- Noise and Vibration		0MEPE407- NDT			0MEPE408- Steam Engineering					
0MEPE45# Professional Elective-IV Laboratory										
0MEPE453- Noise and Vibration		0MEPE454 - NDT			0MEPE455- Steam Engineering					
0MEOE4*** Open Elective										
0MEOE409- Industrial Management and Operation Research		0MEOE410- Industrial Automation and Robotics			0MEOE411- Mechanics of Fibrous Composites					

Head of Department

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B.Tech - ST - 01102

**Teaching and Evaluation Scheme**  
**B. Tech Mechanical Engineering: Sem- VIII**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0MEPC413	Industrial Engineering	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPC414	Smart Materials	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPE41*	Professional Elective-V	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0MEPE45#	Professional Elective-V Laboratory	--	--	2	1	ISE	--		50	20
						ESE	--	OE	50	20
0MEPR459	Project-II	--	--	8	8	ISE	--		100	40
						ESE	--	OE	100	40
Total		09	02	10	20	Total	300		300	
Total Contact Hours/Week: 21 hrs										
Course Category	HS	BS		ES		PC	PE	OE	PR	
Credits	00	00		00		08	04	00	9	
Cumulative Sum	04	16		40		89	18	03	22	
%	2.08	8.33		20.83		46.36	9.38	1.56	11.46	
0MEPE41* Professional Elective-V						0MEPE45# Professional Elective-V Laboratory				
0MEPE415	Vehicle Dynamics					0MEPE457	Vehicle Dynamics			
0MEPE416	Solar Technology					0MEPE458	Solar Technology			

Head of Department

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B.Tech - ST - 02/02



**Annasaheb Dange College of Engineering and  
Technology, Ashta**

**An Autonomous Institute**

**Curriculum Structure**

**S. Y. B. Tech.  
MECHANICAL ENGINEERING**

**SEM III – SEM IV  
w.e.f. 2020-21**

**Department of Mechanical Engineering**



**Teaching and Evaluation Scheme**  
**S.Y. B.Tech.: Sem-III**

Course Code	Course	Teaching Scheme				Evaluation Scheme							
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)				
							Max.	Min. for Passing	Max.	Min. for Passing			
1MEBS201	Engineering Mathematics-III	3	1	--	4	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEPC202	Kinematics of Machines	3	--	--	3	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEPC203	Thermodynamics	4	--	--	4	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEPC204	Strength of Materials	3	--	--	3	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEES205	Materials Science and Metallurgy	3	--	--	3	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEPC206	Manufacturing Processes and Machine Tools	3	--	--	3	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEMC207	Environment Studies	2	--	--	--	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEPC251	Kinematics of Machines Laboratory	--	--	2	1	ISE I	10	40	--	--			
					MSE	30	--		--				
					ISE II	10	--		--				
					ESE	50	--		--				
1MEES252	Materials Science and Metallurgy Laboratory	--	--	2	1	ISE	50	Grade	--	--			
1MEPC253	Workshop Practice -II	--	--	2	1	ISE	--	--	25	10			
1MEHS254	General Proficiency Laboratory	--	--	2	1	ESE	--	OE	25	10			
						ISE	--	--	25	10			
						ESE	--	--	25	10			
						ISE	--	--	25	10			
						ESE	--	--	25	10			
						ISE	--	--	25	10			
						ESE	--	--	25	10			
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						ISE	--	--	25	10			
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						ISE	--	--	25	10			
						ESE	--	--	25	10			
						ISE	--	--	25	10			
						ESE	--	--	25	10			
						ISE	--	--	25	10			
						ESE	--	--	25	10			
						ISE	--	--	25	10			
						ESE	--	--					

Head of Department

Dean Academics

Director

Executive Director

SY-ST-01/02


**Teaching and Evaluation Scheme**  
**S.Y.B. Tech.: Sem- IV**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max.	Min. for Passing	Max.	Min. for Passing
1MEPC208	Dynamics of Machines	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC209	Fluid Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC210	Design of Machine Elements-I	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC211	Tools Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC212	Metrology, Quality Control & Measurement	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEHS213	Economics for Mechanical Engineers	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC255	Dynamics of Machines Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--		--	--
1MEPC256	Fluid Mechanics Laboratory	--	--	2	1	ISE	--	POE	25	10
						ESE	--		25	10
1MEPC257	Metrology, Quality Control & Measurement Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--	--	--	--
1MEPC258	CAD Laboratory	--	--	2	1	ISE	--	--	25	10
						ESE	--	POE	25	10
1MEPC259	Workshop Practice III	--	--	2	1	ISE	--	--	25	10
						ESE	--	POE	25	10
<b>Total</b>		<b>19</b>	<b>0</b>	<b>10</b>	<b>24</b>	<b>Total</b>	<b>600</b>		<b>200</b>	
<b>Total Contact Hours/Week: 29 hrs</b>										
<b>Course Category</b>	<b>HS</b>	<b>BS</b>	<b>ES</b>	<b>PC</b>	<b>PE</b>	<b>OE</b>	<b>PR</b>			
<b>Credits</b>	03	00	00	21	00	00	00			
<b>Cumulative Sum</b>	07	20	24	40	00	00	00			

  
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**Annasaheb Dange College of Engineering and  
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**An Autonomous Institute**

**Curriculum Structure**

**T.Y. B. Tech.  
MECHANICAL ENGINEERING**

**SEM V – SEM VI  
w.e.f. 2021-22**

**Department of Mechanical Engineering**



## Teaching and Evaluation Scheme T.Y.B. Tech: Semester-V

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for Passing	Max.	Min. for Passing	
1OE***	Open Elective-I	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC301	Turbo Machinery	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC302	Heat and Mass Transfer	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC303	Design of Machine Elements -II	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC304	Industrial Hydraulics and Pneumatics	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPE***	Professional Elective-I	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC351	Turbo Machinery Laboratory	--	--	2	1	ISE	--	--	25	10	
IMEPC352	Heat and Mass Transfer Laboratory	--	--	2	1	ESE	--	POE	25	10	
						ISE	--	--	25	10	
						ESE	--	POE	25	10	
IMEPC353	Design of Machine Elements –II Laboratory	--	--	2	1	ISE	--	--	25	10	
						ESE	--	OE	25	10	
IMEPC354	Industrial Hydraulics and Pneumatics Laboratory	--	--	2	1	ISE	--	--	25	10	
						ESE	--	--	--	--	
IMEPC355	CAM Laboratory	--	--	2	1	ISE	--	--	25	20	
						ESE	--	--	--	--	
Total		18	0	10	23	Total	600		200		
Total Contact Hours/Week: 28 hrs											
Course Category		HS	BS		ES	PC	PE	OE	PR		
Credits		00	00		00	17	03	03	00		
Cumulative Sum		07	20		24	57	03	03	00		
1MEPE3** Professional Elective-I											
1MEPE305- Power Plant Engineering			1MEPE306- Mechanical System Design			1MEPE307- Advanced Manufacturing Technology					

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T.Y. ME - 01/20



Open Elective-I (Semester-V)		
Courses Code	Course Name	Department
1AEOE311	Introduction to Flight	Aeronautical Engineering
1AEOE312	Introduction to Experimental Aerodynamics	
1AEOE313	Introduction to Gas Dynamics and Jet Propulsion	
1AEOE314	Introduction to Unmanned Aerial Vehicles	
1AUOE301	Product Design and Development	Automobile Engineering
1AUOE302	Automotive Refrigeration and Air Conditioning	
1CVOE301	Air Pollution & Control	Civil Engineering
1CVOE302	Remote Sensing & GIS Applications	
1CSOE301	Database Essentials and Business Intelligence	Computer Science and Engineering
1CSOE302	Software Engineering and Project Management	
1CSOE303	Data Structures and Algorithms	
1EEOE301	Electrical Technology	Electrical Engineering
1EEOE302	Electrical and Electronics Measurements	
0FTOE311	Packaging Technology	Food Engineering
1MEOE301	Industrial Automation and Robotics	Mechanical Engineering
1MEOE302	Composite Materials	
1MEOE303	Solar Technology	

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TY ME-02/80



Teaching and Evaluation Scheme  
T.Y.B. Tech: Semester-VI

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max.	Min. for Passing	Max.	Min. for Passing
1OE***	Open Elective-II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC308	Control Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC309	Refrigeration & Air Conditioning	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC310	Noise and Vibration	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC311	Mechatronics and Robotics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPE***	Professional Elective-II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1MEPC356	Refrigeration & Air Conditioning Laboratory	--	--	2	1	ISE	--	--	25	10
1MEPC357	Noise and Vibration Laboratory	--	--	2	1	ESE	--	POE	25	10
1MEPC358	Mechatronics & Robotics Laboratory	--	--	2	1	ISE	--	--	25	10
1MEPE***	Professional Elective-II Laboratory	--	--	2	1	ESE	--	OE	25	10
1MEPR362	Mini Project	--	--	2	1	ISE	--	--	25	10
Total		18	--	10	23	Total	600		200	
Total Contact Hours/Week: 28 hrs										
Course Category	HS	BS		ES		PC	PE	OE	PR	
Credits	00	00		00		15	04	03	01	
Cumulative Sum	07	20		24		72	07	06	01	

1MEPE3** Professional Elective-II	1MEPE3** Professional Elective-II Laboratory
1MEPE312- I C Engine	1MEPE359- I C Engine
1MEPE313- Machine Tool Design	1MEPE360- Machine Tool Design
1MEPE314- Foundry and Forming Technology	1MEPE361- Foundry and Forming Technology

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1MEPE3** Professional Elective-II	1MEPE3** Professional Elective-II Laboratory
1MEPE312- I C Engine 1MEPE313- Machine Tool Design 1MEPE314- Foundry and Forming Technology	1MEPE359- I C Engine 1MEPE360- Machine Tool Design 1MEPE361- Foundry and Forming Technology

Open Elective-II (Semester-VI)		
Courses Code	Course Name	Department
1AEOE321	Lighter Than Air Systems	Aeronautical Engineering
1AEOE322	Airline and Airport Management	
1AEOE323	Flight Scheduling and Operations	
1AUOE310	Vibration based fault diagnosis	Automobile Engineering
1AUOE311	Engineering Tribology	
1CVOE310	Operation Research	Civil Engineering
1CVOE311	Economics And Management	
1CSOE311	Internet of Things	Computer Science and Engineering
1CSOE312	Cyber Laws and Ethical Hacking	
1EEOE306	Electrical Wiring Harnessing	Electrical Engineering
1EEOE307	Electrical Economics & Energy Audit	
0FTOE321	Process Modeling and Simulation	Food Engineering
1MEOE304	Industrial Management and Operation Research	Mechanical Engineering
1MEOE305	Non-Destructive Testing	
1MEOE306	Computational Fluid Dynamics	

  
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**Annasaheb Dange College of Engineering and  
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## **Curriculum Structure**

**B. Tech.  
MECHANICAL ENGINEERING**

**SEMESTER VII- VIII**

**w.e.f. 2022-23**

**Department of Mechanical Engineering**



**Teaching and Evaluation Scheme**  
**B. Tech: Semester-VII**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for Passing	Max.	Min. for Passing	
1OE***	Open Elective-III	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC401	Vehicle Engineering	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC402	Finite Element Analysis	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPE***	Professional Elective-III	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPE***	Professional Elective-IV	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
IMEPC451	Finite Element Analysis Laboratory	--	--	2	1	ISE	--	--	25	10	
IMEPE***	Professional Elective-III Laboratory	--	--	2	1	ESE	--	POE	25	10	
IMEPR455	Project	--	--	10	5	ISE	--	--	25	10	
						ESE	--	OE	25	10	
						ISE	--	--	50	20	
						ESE	--	OE	50	20	
Total		15	--	14	22	Total	350		200		
Total Contact Hours/Week: 29 hrs											
Course Category		HS		BS		ES		PC		PR	
Credits		00		00		00		07		05	
Cumulative Sum		07		20		24		79		06	
1MEPE*** Professional Elective-III						1MEPE*** Professional Elective-IV					
1MEPE403- CFD						1MEPE406- Energy Management					
1MEPE404- Condition Monitoring						1MEPE407- Reliability Engineering					
1MEPE405- Non-Destructive Testing						1MEPE408- Industrial Engineering					
1MEPE*** Professional Elective-III Laboratory						1OE*** Open Elective-III					
1MEPE452- CFD						1MEOE401- Total Quality Management					
1MEPE453- Condition Monitoring						1MEOE402- Reliability Engineering					
1MEPE454- Non-Destructive Testing						1MEOE403 - Renewable Energy Engineering					

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Department of Mechanical Engineering

Open Elective-III (Semester-VII)		
Courses Code	Course Name	Department
1AEOE421	Air Traffic Control and Airport Design	Aeronautical Engineering
1AEOE422	Aircraft General Engineering Maintenance	
1AEOE423	Design of Fixed Wing Unmanned Aerial Vehicles	
1AUOE401	Vehicle Maintenance and Safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1CSOE401	Introduction to Image Processing and Computer Vision	Computer Science and Engineering
1CSOE402	Introduction to Machine Learning	
1EEOE401	Electric Vehicles	Electrical Engineering
1EEOE402	Wind and Solar Energy Systems	
0FTOE411	Process Optimization	Food Technology
0FTOE412	Cold Storage and Supply Chain Management	
1MEOE401	Total Quality Management	Mechanical Engineering
1MEOE402	Reliability Engineering	
1MEOE403	Renewable Energy Engineering	



  
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ME-ST-02/03



**ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY, ASHTA**  
(An Autonomous Institute)  
**Department of Mechanical Engineering**

**Teaching and Evaluation Scheme**

**B. Tech : Semester-VIII**

Course Code	Course	Teaching Scheme				Evaluation Scheme						
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)			
							Max.	Min. for Passing	Max.	Min. for Passing		
1MEHS409	Project and Finance Management	3	--	--	3	MSE	50	40	--	--		
						ESE	50		20	--	--	
1MEMC411	Constitution of India	2	--	--	--	ISE	Audit		--	--		
1MEPR459	Internship/ Project	--	--	12	6	ISE	--	--	100	40		
						ESE	--	POE	100	40		
Total		5	0	12	9	Total	100		200			
Total Contact Hours/Week: 17 hrs												
Course Category		HS		BS		ES		PC		PE	OE	PR
Credits		03		00		00		00		00		06
Cumulative Sum		10		20		24		79		14		12
Credits (AICTE)		12		25		24		48		18		15



  
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ME-ST-03/03





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Annasaheb Dange College of Engineering and Technology, Ashta  
An Autonomous Institute  
Department of Electrical Engineering

**B. Tech. Semester- I**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1EEBS101	Applied Mathematics- I	3	1	-	4	ISE - I	10	--	40	--
						MSE	30			--
						ISE - II	10			--
						ESE	50			--
1EEBS102	Applied Chemistry	3	-	-	3	ISE - I	10	--	40	--
						MSE	30			--
						ISE - II	10			--
						ESE	50			--
1EEES103	Fundamentals of Electrical Engineering	3	-	-	3	ISE - I	10	--	40	--
						MSE	30			--
						ISE - II	10			--
						ESE	50			--
1EEES104	Fundamentals of Mechanical Engineering	2	-	-	2	ISE - I	10	--	40	--
						MSE	30			--
						ISE - II	10			--
						ESE	50			--
1EEES105	Fundamentals of Civil Engineering & Applied Mechanics	3	-	-	3	ISE - I	10	--	40	--
						MSE	30			--
						ISE - II	10			--
						ESE	50			--
1EEBS151	Applied Chemistry Laboratory	-	-	2	1	ISE	--	--	25	10
1EEES152	Fundamentals of Electrical Engineering Laboratory	-	-	2	1	ISE	--	--	25	10
1EEES153	Fundamentals of Civil Engineering & Applied Mechanics Laboratory	-	-	2	1	ISE	--	--	25	10
1EEES154	Electrical Workshop Practice	-	-	2	1	ISE	--	--	25	10
<b>Total</b>		<b>14</b>	<b>1</b>	<b>8</b>	<b>19</b>	--	<b>500</b>	--	<b>100</b>	--
<b>Total Contact Hours/Week: 23hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	--	08	11	--	--	--	--
Cumulative Sum	--	08	11	--	--	--	--

  
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Department of Electrical Engineering

**B. Tech. Semester- II**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1EEBS106	Applied Mathematics- II	3	1	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEBS107	Applied Physics	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEES108	Fundamentals of Electronics Engineering	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEES109	Engineering Graphics	2	-	-	2	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEHS110	Professional Communication	2	-	2	3	ISE	--	--	50	20
1EEBS155	Applied Physics Laboratory	-	-	2	1	ISE	--	--	25	10
1EEES156	Fundamentals of Electronics Engineering Laboratory	-	-	2	1	ISE	--	--	25	10
1EEES157	Engineering Graphics Laboratory	-	-	2	1	ISE	--	--	25	10
1EEES158	Programming in 'C' Laboratory	2	-	2	3	ISE	--	--	50	20
<b>Total</b>		<b>16</b>	<b>1</b>	<b>10</b>	<b>21</b>	--	<b>400</b>	--	<b>175</b>	--
<b>Total Contact Hours/Week: 27 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	03	08	10	--	--	--	--
Cumulative Sum	03	16	21	--	--	--	--

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**B. Tech. Semester- III**


Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1EEBS201	Applied Mathematics – III	3	1	-	4	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50	20	--	--
1EEPC202	Electrical Circuit Analysis	3	-	-	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50	20	--	--
1EEPC203	Analog Electronics	3	-	-	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50	20	--	--
1EEPC204	Electrical Measurements & Instrumentation	3	-	-	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50	20	--	--
1EEES205	Electrical Engineering Materials	3	-	-	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50	20	--	--
1EEHS206	Industrial Psychology	1	-	-	1	ISE	--	--	25	10
1EEPC251	Electrical Circuit Analysis Laboratory	-	-	2	1	ISE	--	--	25	10
1EEPC252	Analog Electronics Laboratory	-	-	2	1	ISE	--	--	25	10
1EEPC253	Electrical Measurements & Instrumentation Laboratory	-	-	2	1	ESE	POE		50	20
						ISE	--	--	25	10
1EEES254	Programming in C++ Laboratory	1	-	2	2	ESE	POE		50	20
						ISE	--	--	50	20
1EEMC207	Environmental Studies	2	-	-	-	ISE	Grade		--	--
<b>Total</b>		<b>19</b>	<b>1</b>	<b>8</b>	<b>22</b>	--	<b>500</b>	--	<b>250</b>	--
<b>Total Contact Hours/Week: 28hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	04	05	12	--	--	--
Cumulative Sum	04	20	26	12	--	--	--

  
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Department of Electrical Engineering

**B. Tech. Semester- IV**

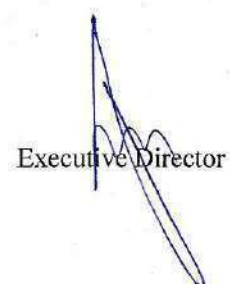
Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1EEPC208	Signals & Systems	3	1	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC209	Fundamentals of Power System	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC210	DC Machines & Transformers	4	-	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC211	Digital Electronics & Microprocessor	4	-	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC212	Electromagnetic Engineering	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC255	DC Machines & Transformers Laboratory	-	-	2	1	ISE	--	--	25	10
1EEPC256	Digital Electronics and Microprocessor Laboratory	-	-	2	1	ESE	POE		50	20
1EEES257	MATLAB for Electrical Engineering	-	-	2	1	ISE	--	--	25	10
1EEHS258	English Proficiency	-	-	2	1	ESE	POE		50	20
<b>Total</b>		<b>17</b>	<b>1</b>	<b>8</b>	<b>22</b>	ISE	--	--	50	20
<b>Total Contact Hours/Week: 26hrs</b>						--	<b>500</b>	--	<b>250</b>	--

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	--	01	20	--	--	--
Cumulative Sum	05	20	27	32	--	--	--

  
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Department of Electrical Engineering

**B. Tech. Semester-V**


Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1##OE###	Open Elective- I	3	-	-	3	ISE - I	10	--	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC303	Control Systems	4	-	-	4	ISE - I	10	--	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC304	AC Machines	4	-	-	4	ISE - I	10	--	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC305	Power Electronics	4	-	-	4	ISE - I	10	--	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC308	Power Systems Analysis	4	-	-	4	ISE - I	10	--	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC351	Control Systems Laboratory	-	-	2	1	ISE	--	--	25	10
1EEPC352	AC Machines Laboratory	-	-	2	1	ISE	--	--	25	10
1EEPC353	Power Electronics Laboratory	-	-	2	1	ESE	POE		50	20
1EEPC354	Power Systems Analysis Laboratory	-	-	2	1	ISE	--	--	25	10
1EEPC354	Power Systems Analysis Laboratory	-	-	2	1	ESE	POE		50	20
EMC309	Constitution of India	2	-	-	-	ISE	--	--	25	10
						ISE	Grade		--	--
<b>Total</b>		<b>20</b>	<b>-</b>	<b>8</b>	<b>23</b>	<b>--</b>	<b>500</b>	<b>--</b>	<b>200</b>	<b>--</b>
<b>Total Contact Hours/Week: 28hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	--	--	--	20	--	03	--
Cumulative Sum	05	20	27	52	--	03	--

  
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**[1##OE###] Open Elective – I**

Course Code	Course Name	Course Offered by
1ME0E101	Machines and Mechanisms	Mechanical Engineering
1ME0E102	Manufacturing Engineering	
1CSOE301	Database Essentials	Computer Science and Engineering
1CSOE302	Software Engineering and Project Management	
1CSOE303	Data Structures and Algorithms	
1EEOE301	Electrical Technology	Electrical Engineering
1EEOE302	Electrical and Electronics Measurements	
1CVOE301	Air Pollution & Control	Civil Engineering
1CVOE302	Remote Sensing & GIS Applications	
1AUOE301	Product design and development	Automobile Engineering
1AUOE302	Automotive Refrigeration and air conditioning	
1AEOE101	Introduction to Aerospace Engineering	Aeronautical Engineering
1AEOE102	Drone Piloting	

  
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**T. Y. B. Tech. Semester- VI**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1#OE###	Open Elective- II	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50	20	--	--
IEEPC310	Electrical Machine and Power System Design	2	1	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50	20	--	--
IEEES311	Microcontroller and Its Applications	4	-	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50	20	--	--
IEEPE3**	Professional Elective- I	4	-	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50	20	--	--
IEEPE3**	Professional Elective- II	4	-	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50	20	--	--
IEEPC355	Electrical Machine and Power System Design Laboratory	-	-	2	1	ISE	--	--	25	10
IEEES356	Microcontrollers and Its Applications Laboratory	-	-	2	1	ESE	POE		50	20
IEEPE3**	Professional Elective- I Laboratory	-	-	2	1	ISE	--	--	25	10
IEEPR360	Mini Project	-	-	4	2	ESE	POE		50	20
Total		17	1	10	23	ISE	--	--	75	30
Total Contact Hours/Week: 28hrs						--	500	--	250	--

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	--	--	05	04	09	03	02
Cumulative Sum	05	20	32	56	09	06	02

  
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➤ **Professional Elective -I**

Sr. No.	Course Code	Professional Elective -I	Sr. No.	Laboratory Course Code	Professional Elective - I Laboratory
1	IEEPE312	Control System Design	1	IEEPE357	Control System Design Laboratory
2	IEEPE313	Electrical Drives	2	IEEPE358	Electrical Drives Laboratory
3	IEEPE314	Power Systems Dynamics and Control	3	IEEPE359	Power Systems Dynamics and Control Laboratory

➤ **Professional Elective -II**

Sr. No.	Course Code	Professional Elective -II
1	IEEPE315	Digital Signal Processing
2	IEEPE316	Electric Vehicles and Smart Grid
3	IEEPE317	Analog and Digital Communication

➤ **[1##OE###] Open Elective - II**

Open Elective-II (Semester-VI)		Department
Courses Code	Course Name	
1AEOE321	Lighter Than Air Systems	Aeronautical Engineering
1AEOE322	Airline and Airport Management	
1AEOE323	Flight Scheduling and Operations	
1AUOE310	Vibration based fault diagnosis	Automobile Engineering
1AUOE311	Engineering Tribology	
1CVOE310	Operation Research	Civil Engineering
1CVOE311	Economics And Management	
1CSOE311	Internet of Things	Computer Science and Engineering
1CSOE312	Cyber Laws and Ethical Hacking	
1EEOE306	Electrical Wiring Harnessing	Electrical Engineering
1EEOE307	Electrical Economics & Energy Audit	
0FTOE321	Process Modeling and Simulation	Food Engineering
1MEOE304	Industrial Management and Operation Research	Mechanical Engineering
1MEOE305	Non-Destructive Testing	
1MEOE306	Computational Fluid Dynamics	

  
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**B. Tech. Semester- VII**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1##OE###	Open Elective- III	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC403	Switchgear & Protection	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC404	High Voltage Engineering	3	-	-	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEHS405	Economics for Engineers	2	-	-	2	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPE4**	Professional Elective- III	4	-	-	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
1EEPC451	Switchgear & Protection Laboratory	-	-	2	1	ISE	--	--	25	10
						ESE	POE		25	10
1EEPC452	High Voltage Engineering Laboratory	-	-	2	1	ISE	--	--	25	10
1EEPR453	Seminar	-	-	2	1	ISE	--	--	25	10
1EEPR454	Project Phase - I	-	-	4	4	ISE	--	--	100	40
						ESE	POE		50	20
		15	-	10	22	--	500	--	250	--
Total Contact Hours/Week: 25hrs										

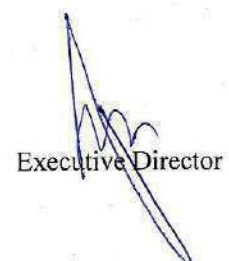
Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	02	--	--	08	04	03	05
Cumulative Sum	07	20	27	69	13	09	07

  
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➤ Professional Elective -III

Sr. No.	Course Code	Professional Elective -III
1	1EEPE406	Industrial Drives
2	1EEPE407	Embedded Systems
3	1EEPE408	Power Quality Issues and Mitigation

➤ [1##OE###] Open Elective – III

Course Code	Course Name	Course Offered by
1ME0E105	Reliability Engineering	Mechanical Engineering
1ME0E106	Vibration Measurement & Analysis	
1CSOE401	Computer Vision	Computer Science and Engineering
1CSOE402	Machine Learning	
1EEOE401	Electric and Hybrid Vehicles	Electrical Engineering
1EEOE402	Wind and Solar Energy Systems	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1AUOE401	Vehicle maintenance and safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1AEOE105	Helicopter Engineering	Aeronautical Engineering
1AEOE106	Composite Structure Fabrication	

  
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**B. Tech. Semester- VIII**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1EEHS409	Disaster Management	2	-	-	2	ISE - I	10	--	40	--	--
						MSE	30			--	--
						ISE - II	10			--	--
						ESE	50			20	--
1EEPE4**	Professional Elective- IV	4	-	-	4	ISE - I	10	--	40	--	--
						MSE	30			--	--
						ISE - II	10			--	--
						ESE	50			20	--
1EEPE4**	Professional Elective- V	4	-	-	4	ISE - I	10	--	40	--	--
						MSE	30			--	--
						ISE - II	10			--	--
						ESE	50			20	--
1EEPR455	Project Phase- II	-	-	8	8	ISE	--	--	100	40	
						ESE	--				
Total		10	-	08	18	POE			100	40	
Total Contact Hours/Week:18hrs						--	300	--	200	--	


Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	02	--	--	--	08	--	08
Cumulative Sum	09	20	27	69	21	09	15

**Cumulative Sum of Credits- 170**

  
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Annasaheb Dange College of Engineering and Technology, Ashta  
An Autonomous Institute  
Department of Electrical Engineering

➤ Professional Elective -IV

Sr. No.	Course Code	Professional Elective -IV
1	1EEPE410	Energy Storage Systems
2	1EEPE411	Industrial Automation and SCADA
3	1EEPE412	FACTS

➤ Professional Elective -V

Sr. No.	Course Code	Professional Elective -V
1	1EEPE413	Electrical Vehicles & Smart Grid
2	1EEPE414	Electrical Installation, Testing and Maintenance
3	1EEPE415	HVDC Systems

➤ Comparison of AICTE & Institute Curriculum

Course Category	HS	BS	ES	PC	PE	OE	PR	Total
AICTE	12	26	20	53	18	18	11	158
Department of Electrical Engineering	09	20	27	69	21	9	15	170
AICTE (%)	7.5	16.4	17.0	33.5	11.4	11.4	6.9	100
Department of Electrical Engineering (%)	5.2	11.7	15.8	40.5	12.3	5.2	8.8	100

  
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**Teaching and Evaluation Scheme**  
**B. Tech: Semester I (Physics Group)**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 101	Applied Physics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 102	Applied Mathematics I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 103	Basic Electrical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 104	Basic Civil Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 105	Engineering Graphics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSHS 106	Professional Communication	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 107	Applied Mathematics I Tutorial	--	1	--	1	ISE	--	--	25	10
OBSES 151	Workshop Practice I	--	--	2	1	ISE	--	--	50	20
OBSBS 152	Applied Physics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 153	Basic Electrical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 154	Basic Civil Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 155	Engineering Graphics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSHS 156	Professional Communication Laboratory	--	--	2	1	ISE	--	--	25	10
Total		17	1	12	24		600		200	
Total Contact Hours/Week: 30 hrs										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	3	8	13					
Cumulative Sum	3	8	13					





**ANNASAHB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY,  
ASHTA**

(An Autonomous Institute)

F.Y. B. Tech (Common to All Branches)

**Teaching and Evaluation Scheme  
B. Tech: Semester I (Chemistry Group)**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 108	Applied Chemistry	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 102	Applied Mathematics I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 109	Basic Electronic Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 110	Engineering Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 111	Basic Mechanical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 112	Computer Programming	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 107	Applied Mathematics I Tutorial	--	1	--	1	ISE	--	--	25	10
OBSES 157	Basic Electronic Engineering Laboratory	--	--	2	1	ISE	--	--	50	20
OBBSBS 158	Applied Chemistry Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 159	Engineering Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 160	Basic Mechanical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 161	Computer Programming Laboratory	--	--	4	2	ISE	--	--	50	20
<b>Total</b>		<b>17</b>	<b>1</b>	<b>12</b>	<b>24</b>		<b>600</b>		<b>200</b>	
<b>Total Contact Hours/Week: 30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
<b>Credits</b>	<b>0</b>	<b>8</b>	<b>16</b>					
<b>Cumulative Sum</b>	<b>0</b>	<b>8</b>	<b>16</b>					

Head of Department

Dean Academics

Principal

Executive Director

**Teaching and Evaluation Scheme  
B. Tech: Semester II (Physics Group)**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 101	Applied Physics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 113	Applied Mathematics II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 103	Basic Electrical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 104	Basic Civil Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 105	Engineering Graphics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSHS 106	Professional Communication	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 114	Applied Mathematics II Tutorial	--	1		1	ISE	--	--	25	10
OBSES 151	Workshop Practice I	--	--	2	1	ISE	--	--	50	20
OBBSBS 152	Applied Physics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 153	Basic Electrical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 154	Basic Civil Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 155	Engineering Graphics Laboratory	--	--	2	1	ISE	--	--	25	10
OBBSHS 156	Professional Communication Laboratory	--	--	2	1	ISE	--	--	25	10
<b>Total</b>		<b>17</b>	<b>1</b>	<b>12</b>	<b>24</b>		<b>600</b>		<b>200</b>	
<b>Total Contact Hours/Week: 30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
<b>Credits</b>	<b>3</b>	<b>8</b>	<b>13</b>					
<b>Cumulative Sum</b>	<b>3</b>	<b>16</b>	<b>29</b>					



**Teaching and Evaluation Scheme  
B. Tech: Semester II (Chemistry Group)**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 108	Applied Chemistry	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 113	Applied Mathematics II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 109	Basic Electronic Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 110	Engineering Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 111	Basic Mechanical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 112	Computer Programming	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 114	Applied Mathematics II Tutorial	--	1	--	1	ISE	--	--	25	10
OBSES 157	Basic Electronic Engineering Laboratory	--	--	2	1	ISE	--	--	50	20
OBSBS 158	Applied Chemistry Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 159	Engineering Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 160	Basic Mechanical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 161	Computer Programming Laboratory	--	--	4	2	ISE	--	--	50	20
<b>Total</b>		<b>17</b>	<b>1</b>	<b>12</b>	<b>24</b>		<b>600</b>		<b>200</b>	
<b>Total Contact Hours/Week: 30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
<b>Credits</b>	<b>0</b>	<b>8</b>	<b>16</b>					
<b>Cumulative Sum</b>	<b>3</b>	<b>16</b>	<b>29</b>					





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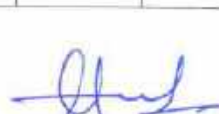
**B. Tech Electrical Engineering: III Semester**

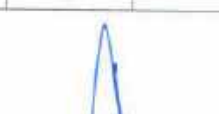
Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0EEBS201	Applied Mathematics – III	3	1	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC202	Electrical Circuits & Networks	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC203	Electrical Engineering Materials	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC204	Analog Electronics	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC205	Electrical Measurements	3	--	--	3	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC251	Electrical Circuits & Networks Laboratory	--	--	2	1	ISE	--	--	50	20
0EEPC252	Analog Electronics Laboratory	--	--	2	1	ESE	POE		50	20
0EEPC253	Electrical Measurements Laboratory	--	--	2	1	ISE	--	--	50	20
						ESE	POE		50	20
0EEES254	Programming in C++	1	--	2	2	ISE	--	--	50	20
0EEMC206	Environmental Studies	2	--	--	--	ISE	Grade		--	--
Total		21	1	8	24	--	500	--	300	--
Total Contact Hours/Week: 30 hrs										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC	PR
Credits	--	4	2	18	--	--	--	--	--
Cumulative Sum	3	20	31	18	--	--	--	--	--

  
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**B. Tech Electrical Engineering: IV Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0EEES207	Signals & Systems	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC208	Generation, Transmission & Distribution	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC209	DC Machines & Transformers	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEES210	Digital Electronics	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC211	Instrumentation & Communication	4	--	--	4	ISE - I	10	40	--	--
						MSE	30		--	--
						ISE - II	10		--	--
						ESE	50		--	--
0EEPC255	DC Machines & Transformers Laboratory	--	--	2	1	ISE	--	--	50	20
0EEES256	Digital Electronics Laboratory	--	--	2	1	ESE	POE		50	20
0EEPC257	Instrumentation & Communication Laboratory	--	--	2	1	ISE	--	--	50	20
						ESE	POE		50	20
0EEPC258	Software Tools for Electrical Engineering	--	--	2	1	ISE	--	--	50	20
0EEAC212	Professional Skills-I	2	--	--	--	ISE	Grade		--	--
<b>Total</b>		<b>22</b>	<b>--</b>	<b>8</b>	<b>24</b>	<b>--</b>	<b>500</b>	<b>--</b>	<b>300</b>	<b>--</b>
<b>Total Contact Hours/Week: 30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC	PR
Credits	--	--	9	15	--	--	--	--	--
Cumulative Sum	3	20	40	33	--	--	--	--	--

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**B. Tech. Semester –V**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0EEPC301	Feedback Control Systems	4	--	--	4	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC302	Power System Analysis	4	--	--	4	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC303	AC Machines	4	--	--	4	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC304	Power Electronics	4	--	--	4	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC305	Electromagnetic Engineering	4	--	--	4	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC351	AC Machines Laboratory	--	--	2	1	ISE	--	--	50	20
0EEPC352	Power Electronics Laboratory	--	--	2	1	ESE	POE		50	20
0EEPC353	Power System Analysis Laboratory	--	--	2	1	ISE	--	--	50	20
0EEPC354	Feedback Control Systems Laboratory	--	--	2	1	ESE	POE		50	20
0EEAC306	Professional Skills-II	2	--	--	--	ISE	--	--	50	20
<b>Total</b>		<b>22</b>	<b>--</b>	<b>8</b>	<b>24</b>	--	--	Grade	--	--
<b>Total Contact Hours/Week: 30 hrs</b>										
							<b>500</b>	<b>--</b>	<b>300</b>	<b>--</b>

Course Category	HS	BS	ES	PC	PE	OE	MC	AC	PR
Credits	--	--	--	24	--	--	--	--	--
Cumulative Sum	3	20	40	57	--	--	--	--	--

  
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**B. Tech. Semester –VI**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0EEPC307	Control System Design	3	--	--	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC308	Power System Operations & Control	3	--	--	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC309	Electrical Drives and Control	3	--	--	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEES310	Microcontroller & It's Applications	3	--	--	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEOE311 To 0EEOE313	Open Elective	3	--	--	3	ISE – I	10	40	--	--
						MSE	30		--	--
						ISE – II	10		--	--
						ESE	50		--	--
0EEPC355	Electrical Machine Design Laboratory	1	--	2	2	ISE	--	--	50	20
0EEPC356	Electrical Drives and Control Laboratory	--	--	2	1	ESE	POE		50	20
0EEES357	Microcontroller & It's Applications Laboratory	--	--	2	1	ISE	--	--	50	20
0EEPC358	Power System Operations & Control Laboratory	--	--	2	1	ESE	POE		50	20
0EEPR359	Mini Project	--	--	2	2	ISE	--	--	25	10
0EEPR360	Seminar	--	--	2	2	ISE	--	--	25	10
<b>Total</b>		<b>15</b>	<b>--</b>	<b>14</b>	<b>24</b>	ISE	--	--	50	20
<b>Total Contact Hours/Week: 29 hrs</b>										
							<b>500</b>	<b>--</b>	<b>300</b>	<b>--</b>

Course Category	HS	BS	ES	PC	PE	OE	MC	AC	PR
Credits	--	--	4	13	--	3	--	--	4
Cumulative Sum	3	20	44	70	--	3	--	--	4

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**List of the Open Electives**

Course Code	Name of Course
0EEOE311	Electric and Hybrid Vehicles
0EEOE312	Digital Signal Processing
0EEOE313	Industrial Automation

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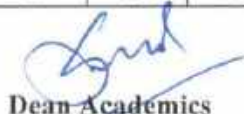
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**B. Tech. Semester -VII**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0EEPC401	Electrical Installation, Testing and Maintenance	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEPC402	Switchgear & Protection	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEHS403	Economics for Engineers	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEPC404	FACTS and HVDC Systems	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEOE4**	Open Elective	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEMC409	Industrial Training	--	1	--	--	--	--	Grade	--	--
0EEAC410	Professional Skills- III	2	--	--	--	--	--	Grade	--	--
0EEPR451	Project Phase - I	--	--	4	4	ISE	---	POE	50	20
						ESE	---		100	40
0EEPC452	Switchgear & Protection Laboratory	--	--	2	1	ISE	---	POE	25	10
						ESE	---		25	10
0EEPC453	FACTS and HVDC Systems Laboratory	--	--	2	1	ISE	---	---	50	20
0EEPC454	Electrical Installation, Testing and Maintenance Laboratory	--	--	2	1	ISE	---	---	50	20
<b>Total</b>		<b>19</b>	<b>1</b>	<b>12</b>	<b>24</b>		<b>500</b>		<b>300</b>	
<b>Total Contact Hours/Week:30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC	PR
Credits	3	--	--	14	--	3	--	--	4
Cumulative Sum	6	20	44	84	3	3	--	--	8

  
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**B. Tech. Semester -VIII**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0EEPC411	Electrical Utilization and Traction	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEPC412	High Voltage Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEPE413 To 0EEPE415	Program Elective II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEPE416 To 0EEPE418	Program Elective III	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0EEAC419	Professional Skills- IV	2	--	--	--	--	--	Grade	--	--
0EEPR455	Project Phase - II	--	--	8	8	ISE	--	POE	100	40
						ESE	--		100	40
0EEES456	Software Packages	--	--	2	1	ISE	--	POE	50	20
						ESE	--		50	20
0EEPC457	Design and Estimation Laboratory	--	--	2	1	ISE	--	--	50	20
0EEPC458	High Voltage Engineering Laboratory	--	--	2	1	ISE	--	--	50	20
<b>Total</b>		<b>19</b>	<b>1</b>	<b>12</b>	<b>24</b>		<b>400</b>		<b>400</b>	
<b>Total Contact Hours/Week:30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC	PR	Total
Credits	--	--	1	9	6	--	--	--	8	192
Cumulative Sum	6	20	45	93	9	3	--	--	16	

  
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• List of Open Electives (OE)

Open Electives (0EEOE4**)	
Course Code	Name of Course
0EEOE405	Renewable Energy Sources
0EEOE406	Industrial Automation, PLC and SCADA
0EEOE407	Electric and Hybrid Vehicles
0EEOE408	Nanotechnology

• List of the Program Electives (PE)

Elective - II		Elective - III	
Course Code	Name of Course	Course Code	Name of Course
0EEPE413	Advanced Relaying	0EEPE416	Smart Grid
0EEPE414	Computer Methods in Power System	0EEPE417	Real Time Control of Power System
0EEPE415	Power Quality and Harmonics	0EEPE418	Energy Audit and Management

Sr. No.	Name of Expert	Designation	Signature with Date
1.	Dr. G. R. Kulkarni	Chairman (HoD)	
2.	Dr. D. S. More	VC-Nominee	
3.	Mr. V. B. Patil	Secretary	

  
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# **Annasaheb Dange College of Engineering and Technology, Ashta**

## **Curriculum Structure (Autonomous)**

### **M. Tech. ELECTRICAL POWER SYSTEM SEM I – SEM IV**

**(To be implemented from Academic Year 2017-18 onwards)**



**Annasaheb Dange College of Engineering and Technology, Ashta**  
**Department of Electrical Engineering**  
**M. Tech. (Electrical Power System)**  
**Teaching and Evaluation Scheme**

**M. Tech Electrical Power System: II Semester**


Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0EEPS507	Power System Planning and Reliability	3	1	--	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0EEPS508	High Voltage Engineering	3	--	--	3	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0EEPS509	Power System Operation and Deregulation	3	1	--	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0EEPS510 To 0EEPS512	Elective-I	3	1	--	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0EEPS513 To 0EEPS515	Elective-II	3	1	--	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0EEPS553	Power Systems Lab-II	--	--	4	2	ISE	--	--	50	20
0EEPS554	High Voltage Engineering	--	--	2	1	ESE	--	POE	50	20
0EEPS555	Seminar II	--	--	2	1	ISE	--	--	50	20
Audit Course										
0EEPS516	Research Methodology	2	--	--	--	--	--	GRADE	--	--
Total		17	4	8	23	--	500	--	200	--
Total Contact Hours/Week: 29hrs										

Course Code	Elective-I	Course Code	Elective-II
0EEPS510	Electrical Power Quality and Harmonics	0EEPS513	Flexible AC Transmission and High Voltage DC System
0EEPS511	Supervisory Control and Data Acquisition & Automation	0EEPS514	Power System Optimization Techniques
0EEPS512	Real Time Control of Power Systems	0EEPS515	Power System Transient Analysis

  
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**M. Tech Electrical Power System: III Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme		
		L	T	P	Credits	Scheme	Practical (Marks)	
							Max	Min for Passing
0EEPS651	Dissertation Phase I	--	--	5**	5	ISE	50	20
0EEPS652	Dissertation Phase II	--	--		10	ISE	50	20
						ESE	100	40
<b>Total</b>		--	--	5	15	--	200	--
<b>Total Contact Hours/Week: 5 hrs</b>								

**M. Tech Electrical Power System: IV Semester**


Course code	Course	Teaching Scheme				Evaluation Scheme		
		L	T	P	Credits	Scheme	Practical (Marks)	
							Max	Min for Passing
0EEPS653	Dissertation Phase III	--	--	5**	10	ISE	100	40
0EEPS654	Dissertation Phase IV	--	--		10	ISE	100	40
						ESE	100	40
<b>Total</b>		--	--	5	20	--	300	--
<b>Total Contact Hours/Week: 5 hrs</b>								

\*\* Indicates: 1) Faculty contact hours per student per/ week


2) Student working Hours: 30 Hrs/Week

Total number of Credits: 80

  
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**M. Tech Electrical Power System: I Semester**

**Course Details:**

<b>Class</b>	M. Tech, Sem.-I
<b>Course Code and Course Title</b>	0EEPS501, Advanced Computer Methods in Power Systems
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	3/1
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To understand the concept of network topology.
02	To analyze power networks by different methods for formation of admittance matrices.
03	To analyze power networks by different methods for formation of impedance matrices.
04	To understand concept of power flow study and study different numerical methods for power flow solution.
05	To discuss simultaneous faults in power networks.
06	To understand two component method to obtain the results in case of various faults on the power system.

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS501_1	Develop various network Matrices (Cognitive Level 6)
0EEPS501_2	Apply different methods to write admittance matrices of power network. (Cognitive Level 3)
0EEPS501_3	Use different methods to develop impedance matrices of power network. (Cognitive Level 3)
0EEPS501_4	Explain algorithm of different numerical methods used for power flow solution. (Cognitive Level 2)
0EEPS501_5	Develop two port networks parameters equations in case of simultaneous faults. (Cognitive Level 6)
0EEPS501_6	Apply two component methods to obtain the results in case of various faults on the power system. (Cognitive Level 3)

**Course Contents:**

<b>Unit 1</b>	<b>Network Topology</b> Introduction, Basic Principles in Power System Analysis, Elementary Graph Theory, Incidence Matrices, Connectivity, Primitive Network, Numerical Treatment Expected	<b>06 Hrs.</b>
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<b>Unit 2</b>	<b>Computer Solution Methods Using the Admittance Matrix</b> Introduction, Formation of YBUS by Singular Transformation, Non-singular Transformation, inspection- Modeling of transmission lines, Modeling of transformer, Modeling of shunt elements, Modeling of loads, Modeling of generator internal impedance, Step by Step Algorithm for Formation of YBUS, Numerical treatment expected	<b>09 Hrs.</b>
<b>Unit 3</b>	<b>Computer Solution Methods Using the Impedance Matrix</b> Impedance matrix in shunt fault computations, impedance matrix algorithm, adding a radial impedance to the reference node, adding a radial branch to a new node, closing a loop to the reference, closing a loop not involving the reference, adding a mutually coupled radial element, adding a group of mutually coupled lines, comparison of admittance and impedance matrix techniques, Numerical treatment expected	<b>07 Hrs.</b>
<b>Unit 4</b>	<b>Computer techniques for Load flow analysis</b> Introduction, Impact of computers, orientation of engineering problems to computers, Power Flow equation, Classification of buses, Operating constraints, Data for load flow, Bus Classification, Modelling for Load Flow Studies, Gauss - Seidel Iterative Method, Newton - Raphson Method-Rectangular Coordinates Method, The Polar Coordinates Method, Sparsity of Network Admittance Matrices, Decoupled Methods, Fast Decoupled Methods, Load Flow Solution Using Z Bus, Comparison of Various Methods for Power Flow Solution.	<b>06 Hrs.</b>
<b>Unit 5</b>	<b>Simultaneous Faults</b> Simultaneous Faults by Two-Port Network Theory- Two port networks, interconnection of two port networks, simultaneous fault connection of sequence networks, series-series connection (Z-type faults), Parallel - parallel connection (Y-type faults), series-parallel connection (H-type faults), Simultaneous faults by matrix transformations- constraint matrix for Z-type faults, constraint matrix for Y-type and H-type faults, Numerical treatment expected.	<b>07 Hrs.</b>
<b>Unit 6</b>	<b>Analytical Simplifications</b> Two Component Method Shunt Faults- SLG Fault, LL Fault, DLG Fault, Three phase fault, Series Faults- 2LO Fault, ILO Fault, Change in symmetry with two component calculations- phase shifting transformer relations, SLG faults with arbitrary symmetry, DLG faults with arbitrary symmetry, series faults with arbitrary symmetry.	<b>07 Hrs.</b>

**Text Books:**

Sr. No	Title	Author	Publisher
01	Circuit Theory (Analysis and Synthesis)	A. Chakrabarti	Dhanpat Rai & Co.
02	Advanced Power System Analysis & Dynamics	L.P. Singh	New Age International Publishers

  
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<b>Text Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
03	Power System Analysis	Grainger, J.J. and Stevenson, W. D.	Tata McGraw-Hill Edition
04	Computer Techniques and Models in Power Systems	K. Uma Rao	I.K. International Publishing House Pvt Ltd

<b>Reference Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	Analysis of Faulted Power Systems	Paul.M. Anderson	IEEE Press Power Systems Engineering Series
02	Circuits Analysis of A.C. power system VOL-II	Edith Clarke	J. Wiley & sons, Incorporated, 1950
03	Introduction to Matrices & Power System	R.Bruce Shipley	Wiley Eastern Ltd
04	Computer methods in Power System Analysis	Stagg G.W. & E.L. Abiad	McGraw-Hill
05	Operation and Control in Power Systems	Prof. P. S. R. Murty	B.S. Publications

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem.-I
<b>Course Code and Course Title</b>	0EEPS502, <b>Advanced Power System Protection</b>
<b>Prerequisite/s</b>	----
<b>Teaching Scheme: Lecture/Tutorial</b>	3/0
<b>Credits</b>	03
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To introduce students to digital power system protection
02	To teach students basic terminology regarding digital protection
03	To teach students the advanced techniques for various power system protection conditions
04	To enhance student's knowledge of various advanced relays.
05	To develop an ability and skills to design the feasible protection systems
06	To develop student's research ability in fundamental things needed for digital protection

**Course Outcomes (COs):**

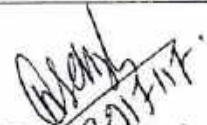
Upon successful completion of this course, the student will be able to:


EEPS502_1	Describe modern protection schemes like applications of microprocessor based relays for the protection of the power system equipment(3 <sup>rd</sup> cognitive level)
EEPS502_2	Explain use of CT / PT & its modeling for digital protection (2 <sup>nd</sup> Cognitive level)
EEPS502_3	Choose appropriate comparator for different protection schemes for various power system conditions (3 <sup>rd</sup> cognitive level)
EEPS502_4	Explain relay coordination to achieve reliability in advanced protection scheme (2 <sup>nd</sup> cognitive level)
EEPS502_5	Explain appropriate differential scheme for various machines (2 <sup>nd</sup> cognitive level).
EEPS502_6	To design suitable digital protection scheme for distance protection (6 <sup>th</sup> cognitive level)

**Course Contents:**

<b>Unit 1</b>	<b>Introduction to Digital Relay:</b> Introduction, Basic Components of Digital Relays with block diagram advantages of microprocessor technology, microprocessor applications to protection	<b>04 Hrs.</b>
<b>Unit 2</b>	<b>Current and Voltage Transformers:</b> Introduction, current transformers, equivalent circuits, transient performance, modeling for transient simulation, use of mimic impedance, voltage transformers, VT model, modeling for transient simulation, wound voltage transformers, relay performance, dynamic compensation for CTs and PTs, compensating	<b>06 Hrs.</b>

  
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	algorithms for CTs and dynamic compensation of CTs, analysis of simulation results. Study of electromagnetic CT & PT, Steady state & Transient state analysis of CVT, Study of residual voltage transformer, natural CT, Mixing Transformer, summation transformer, Optical CT	
<b>Unit 3</b>	<b>Comparator:</b> Characteristic & study of different types of two input phase & amplitude Comparator, Study of multi input comparator	<b>05 Hrs.</b>
<b>Unit 4</b>	<b>Coordination of Inverse Definite Minimum Time (IDMT)/Directional Over Current (DOC) Relays in an Interconnected Power System Network:</b> Plug setting, time setting, radial feeder and ring mains protection, earth fault and phase fault, Directional relay, and microprocessor based o/c relay, Protection of an interconnected system, relay coordination	<b>06 Hrs.</b>
<b>Unit 5</b>	<b>Auto-reclosing and Differential Protection</b> Introduction, history of auto-reclosing, advantageous of auto-reclosing, classification of auto-reclosing, circulating current and opposed voltage principles, percentage differential relay, line protection, carrier aided protection scheme.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Protection of Power System Components:</b> Introduction, bus bar protection, digital protection schemes for bus bars, digital protection schemes for generators <b>a) Transformer Protection:</b> Introduction, digital techniques for protection of transformers, harmonic restraint percentage differential protection, voltage restraint technique, flux restraint approach. <b>b) Distance protection:</b> Impedance, reactance and admittance characteristics, relay settings for 3-zone protection, out of step blocking scheme, blinder relay, numerical relays for transmission line protection, microprocessor based impedance, reactance and mho relays & digital techniques for distance protection.	<b>09 Hrs.</b>

<b>Text Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	Switchgear and protection	U A Bakshi M V Bakshi	Technical Publication
02	Power System protection and Switchgear	Badri Ram, Vishwakarma,	Tata McGraw Hill

  
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Reference Books:			
Sr. No	Title	Author	Publisher
01	Digital Protection of Power Systems	K. Parthasarathy	ISTE WPLP Learning Material Series, Indian Society for Technical Education, Bangalore
02	Fundamentals of Power system Protection	Paithankar Bhide	PHI Learning
03	Power System Protection – Static Relays	T.S. Madhava Rao	TMH Publication

  
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**Course Details:**

<b>Class</b>	M. Tech., Sem.-I
<b>Course Code and Course Title</b>	0EEPS503, Application of Power Electronics with Smart Grid
<b>Prerequisite/s</b>	----
<b>Teaching Scheme: Lecture/Tutorial</b>	3/1
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To introduce various aspects of the smart grid, including technologies, components, architectures and applications
02	To teach the power electronics devices in smart grid
03	To discuss issues and challenges involved in smart grid
04	To discuss communication and information technology in smart grid
05	To discuss Energy Storage devices
06	To explain concepts of Micro-grid

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS503_1	Understand the various aspects of the smart grid, including technologies, components, architectures and applications. (Level-2)
0EEPS503_2	Evaluate Power Electronics devices like Multilevel Inverter in Smart Grid. (Level-5)
0EEPS503_3	Judge the issues and challenges involved in smart grid. (Level-5)
0EEPS503_4	Conclude the role of communication and information technology in smart grid. (Level-5)
0EEPS503_5	Explain various Energy Storage devices. (Level-4)
0EEPS503_6	Evaluate concepts of micro-grid. (Level-5)

**Course Contents:**

<b>Unit 1</b>	<b>Introduction to Smart Grid:</b> Concept, definitions, difference between conventional and smart grid, challenges in smart grid implementation, Overview of the technologies required for the Smart Grid	<b>06 Hrs.</b>
<b>Unit 2</b>	<b>Power Electronics in Smart Grid:</b> Introduction, Multilevel Inverter (MLI) Concept, Types of Multilevel Inverters, Diode-Clamped Multilevel Inverter, Flying-Capacitor Multilevel Inverter, Cascade Multilevel Inverter, Applications, Switching Device Current, DC-link Capacitor Voltage Balancing, and Comparisons of Multilevel Inverters.	<b>07 Hrs.</b>
<b>Unit 3</b>	<b>Renewable energy integration:</b> Carbon Footprint, Renewable Resources: Wind and Solar, Micro-grid Architecture, Modeling PV and wind systems,	<b>07 Hrs.</b>

  
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	Tackling Intermittency, Issues of interconnection, protection & control of micro-grid, Islanding	
<b>Unit 4</b>	<b>Smart Distribution Systems and Energy Storage:</b> Introduction to Smart Meters, Real time pricing, Smart appliances, Automatic meter reading(AMR), Demand response, Energy Storage Technologies: Batteries, Fuel Cell and Hydrogen electrolyser, Flywheels, Superconducting magnetic energy storage systems, super capacitors	<b>07 Hrs.</b>
<b>Unit 5</b>	<b>Introduction of Electric and Hybrid Electric Vehicles (EVs &amp; HEVs):</b> A brief history of EV & PHV, Basics of EV & HEV, Architectures of EV & HEV, HEV fundamentals. Vehicle-to-grid technology	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Micro-grids:</b> Concept of micro-grid, need and applications of micro-grid, formation of micro-grid, Issues of interconnection, protection and control of micro-grid. Plastic and Organic solar cells, Thin film solar cells, Variable speed wind generators, fuel cells, micro turbines, Captive power plants, Integration of renewable energy sources	<b>07 Hrs.</b>

**Text Books:**

Sr. No	Title	Author	Publisher
01	Smart Grid: Technology and Applications	Janaka Ekanayake, Nick Jenkins, Kithsiri Liyanage, Jianzhong Wu, Akihiko Yokoyama	Wiley
02	Power Electronics Circuits, Devices, and Applications	Muhammad H. Rashid	Pearson Publication


**Reference Books:**

Sr. No	Title	Author	Publisher
01	Smart Grid: Fundamentals of Design and Analysis	James Momoh	IEEE Press Series on Power Engineering
02	Integration of Green and Renewable Energy in Electric Power Systems	Ali Keyhani, Mohammad N. Marwali, Min Dai	Wiley
03	Recent literature on Smart Grid		

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem. – I
<b>Course Code and Course Title</b>	0EEPS504, Extra High Voltage AC Transmission
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	3/1
<b>Credits</b>	4
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To introduce EHVAC transmission system.
02	To apply voltage gradient calculation and corona in EHVAC lines.
03	To analyze travelling waves on EHVAC transmission line.
04	To propose over voltages occurring in EHVAC lines.
05	To design insulation for different over voltages.
06	To design EHVAC lines and propose EHV cables.

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS504_1	Describe the basics of EHVAC transmission lines & determine parameters. (3 <sup>rd</sup> cognitive level)
0EEPS504_2	Determine the voltage gradient on conductor. (3 <sup>rd</sup> cognitive level)
0EEPS504_3	Explain about travelling waves and analyze EHVAC lines. (4 <sup>th</sup> cognitive level)
0EEPS504_4	Apply the over voltages knowledge, their causes in EHVAC. (3 <sup>rd</sup> cognitive level)
0EEPS504_5	Explain lightning phenomena & design insulation system for lightning. (5 <sup>th</sup> cognitive level)
0EEPS504_6	Design EHVAC lines. (5 <sup>th</sup> cognitive level)

**Course Contents:**

<b>Unit 1</b>	<b>Introduction to EHVAC transmission:</b> Role of EHVAC transmission, standard transmission voltage, average values of line parameters, power handling capacity, line loss, cost of transmission line, mechanical considerations of line performance, resistance of the conductor, temperature rise, inductance & capacitance calculations	<b>06 Hrs.</b>
<b>Unit 2</b>	<b>Voltage Gradients &amp; Corona:</b> Charge potential relations for multi-conductor relations, surface voltage gradients on conductor, distribution of voltage gradient on sub conductor of bundle. $I^2R$ & corona loss, corona loss formula, charge voltage diagram with corona, Attenuation of travelling waves due to the corona loss, audible noise; corona pulses, their generation & properties, limits for radio	<b>07 Hrs.</b>

  
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	interference fields, CIGRE formula, RI excitation function	
<b>Unit 3</b>	<b>Travelling waves:</b> Introduction, Differential equation & solution for general case, Standing Waves & natural frequency, Open ended line, Double exponential response, Response to the sinusoidal excitation, Line energization with trapped charge voltage, Reflection & refraction of traveling waves.	<b>07Hrs.</b>
<b>Unit 4</b>	<b>Over voltages in EHV Lines by switching operations &amp; Over voltages at power frequency:</b> Introduction to switching over voltages, recovery voltage & circuit breakers, over voltage due to interruption of low inductive current & capacitive currents Ferro resonance over voltage & calculation of switching surges & single phase equivalents. Generalized constants, charging currents, power circle diagram & its use, voltage control, shunt & series compensation, sub synchronous resonance in series capacitor compensated line & static reactive compensating system.	<b>08 Hrs.</b>
<b>Unit 5</b>	<b>Lightning &amp; Insulation coordination:</b> Lightning introduction, general principles of lightning protection problem, Tower footing resistance, Lightning arresters. Insulation levels voltage withstand levels of protected equipment & Insulation co-ordination based on lightning	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Design of the EHVAC lines &amp; EHV cable transmission:</b> Introduction, design factor under steady state, design examples steady state, any one example Introduction to EHV cable, EHV cable electrical properties, cable insulating material properties, design basics of cable insulation, gas insulated EHV lines	<b>06 Hrs.</b>

**Text Books:**

<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	EHVAC transmission Engineering	R. D. Begamudre	New Age international
02	EHVAC & HVDC Transmission Engg. & Design	S. Rao	S.V. Rao
03	Power Transmission System Engg. Analysis & Design	Turon Gonen	John Wiley & sons

  
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**Course Details:**

<b>Class</b>	M. Tech. Sem.-I
<b>Course Code and Course Title</b>	<b>0EEPS505, Power System Dynamics and Stability</b>
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	03/01
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	Students will be able to understand Basic Concepts of dynamical system
02	Students will be able to Model the Power System Components
03	Students will be able to Analyze Sub-Synchronous oscillation
04	Students will be able to Analyze small signal stability of SMIB
05	Students will be able to analysis improving voltage stability
06	Students will be able to Analysis using digital system simulation

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS505_1	Understand Basic Concepts of dynamical system. (Level 2)
0EEPS505_2	Evaluate the Power System Components. (Level 5)
0EEPS505_3	Analyze Sub-Synchronous oscillation. (Level 4)
0EEPS505_4	Analyze small signal stability of SMIB. (Level 4)
0EEPS505_5	Analysis improving voltage stability. (Level 4)
0EEPS505_6	Analysis using digital system simulation. (Level 4)

**Course Contents:**

<b>Unit 1</b>	<b>Basic Concepts:</b> Basic Concepts of dynamical system, formation of State space equations: Concept of Dynamic Instability, Voltage Instability, Angle Instability, Steady State & Dynamic problem in A.C. Systems.	<b>06 Hrs.</b>
<b>Unit 2</b>	<b>Modeling of Power System Components:</b> Synchronous machine, excitation system, prime movers, governors, Transmission lines, transformers & loads.	<b>08 Hrs.</b>
<b>Unit 3</b>	<b>Sub-Synchronous oscillation:</b> Turbine generator torsional characteristics, torsional interaction with power system controls, sub- synchronous resonance Analysis & counter measures using PSS.	<b>07 Hrs.</b>
<b>Unit 4</b>	<b>Small Signal Stability:</b> Fundamental concepts of stability of dynamic systems, Eigen properties of	<b>07 Hrs.</b>

  
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	the state matrix, small signal stability of SMIB, effects of excitation system.	
<b>Unit 5</b>	<b>Voltage stability:</b> Basic concepts of voltage stability, voltage collapse, voltage stability analysis & methods of improving voltage stability.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Transient Instability:</b> Analysis using digital simulation, Analysis using energy function, Study of various numerical methods, Fix step method, Variable step method.	<b>08 Hrs.</b>

**Text Books:**

Sr. No	Title	Author	Publisher
1.	Power System Stability & Control	P. Kundur	New Age
2.	Power System Dynamic and Stability	C. W. Taylor	Willey

**Reference Books:**

Sr. No	Title	Author	Publisher
1.	Power System Voltage Stability	K. R. Padiyar	New Age
2.	Power System Stability & Control	P. M. Anderson Fauad	Tata Macro hill

  
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**Course Details:**

<b>Class</b>	M. Tech Sem.I
<b>Course Code and Course Title</b>	0EEPS506, <b>Energy Audit and Management</b>
<b>Prerequisite/s</b>	--
<b>Teaching Scheme: Lecture/Tutorial</b>	04/00
<b>Credits</b>	00
<b>Evaluation Scheme: ISE / MSE / ESE</b>	Grade

**Course Educational Objectives(CEOs):**

The course aims to:

01	Understand importance of energy and energy security.
02	Understand impact of use energy resources on environment and emission standards, different operating frame work.
03	Follow format of energy management, energy policy.
04	Learn various tools of Demand Control.
05	Calculate economic viability of energy saving option

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS506_1	Explain overall Energy Scenario (Cognitive Level 2)
0EEPS506_2	Identify various forms of Energy (Cognitive Level 1)
0EEPS506_3	Explain basics of Energy Auditing and instruments for energy audit (Cognitive Level 2)
0EEPS506_4	Analyze various parameter of audit for different systems (Cognitive Level 4)
0EEPS506_5	Understand concept of demand side management (Cognitive Level 2)
0EEPS506_6	Implement work with economic feasibility(Cognitive Level 4)

**Course Contents**

Unit 1	<b>Energy Scenario</b> Commercial and Non-Commercial Energy, Primary Energy Resources, Commercial Energy Production, Final Energy Consumption, Energy Needs of Growing Economy, Long Term Energy Scenario, Energy Pricing, Energy Sector Reforms, Energy and Environment, Air Pollution, Climate Change, Energy Security, Energy Conservation and its Importance, Energy Strategy for the Future, Energy Conservation Act-2001 and its Features.	6Hrs.
Unit 2	<b>Basic of Energy and its various forms</b> Electricity basics - DC & AC currents, Electricity tariff, Load management and Maximum demand control, Power factor. Thermal basics -Fuels, Thermal energy contents of fuel, Temperature & Pressure, Heat capacity, Sensible and Latent heat, Evaporation,	6Hrs.

  
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	Condensation, Steam, Moist air and Humidity & Heat transfer, Units and conversion.	
Unit 3	<b>Energy Management &amp; Audit</b> Definition, Energy audit- need, Types of energy audit, Energy management (audit) approach-understanding energy costs, Bench marking, Energy performance, Matching energy use to requirement, Maximizing system efficiencies, Optimizing the input energy requirements, Fuel and energy substitution, Energy audit instruments	6 Hrs.
Unit 4	<b>Energy Conservation in Applications</b> Motive power (motor and drive system). b) Illumination c) Heating systems ( boiler and steam systems) c) Ventilation( Fan, Blower, Compressors) and Air Conditioning systems d) Pumping System e) Cogeneration and waste heat recovery systems f) Utility industries ( T and D Sector)g) Diesel generators	8Hrs.
Unit 5	<b>Demand Management</b> Supply side management (SSM), various measures involved such as use of FACTS, VAR Compensation, Generation system up gradation, constraints on SSM. Demand side management (DSM), advantages and Barriers, implementation of DSM, areas of development of demand side management in agricultural, domestic and commercial consumers. Demand management through tariffs (TOD). Power factor penalties and incentives in tariff for demand control. Apparent energy tariffs. Role of renewable energy sources in energy management, direct use (solar thermal, solar air conditioning, biomass) and indirect use (solar, wind etc.)	10Hrs.
Unit 6	<b>Financial Management and Case Studies</b> Investment-need, Appraisal and criteria, Financial analysis techniques- Simple payback period, Return on investment, Net present value, Internal rate of return, Cash flows, Risk and sensitivity analysis; Financing options, Energy performance contracts and role of ESCOs. Energy audit case studies such as IT sector, Textile, Municipal corporations, Educational Institutes, T and D Sector and Thermal Power stations.	6 Hrs.

**Text Books:**

Sr. No	Title	Author	Publisher
01	Energy Management, Audit and Conservation	Barun Kumar de	Vriand Publication

  
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**Reference Books:**

Sr. No	Title	Author	Publisher
1	Success stories of Energy Conservation	Bureau of Energy Efficiency	Bureau of Energy Efficiency
2	Energy Management	W.R. Murphy and Mackay	Reed Elsevier India Private Limited
3	Energy Auditing made simple	Balasubramanian	Bala Consultancy Services
4	Utilization of electrical energy	S.C. Tripathi	Tata McGraw Hill
5	Generation and utilization of Electrical Energy	B.R. Gupta	S. Chand Publication

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem.-I
<b>Course Code and Course Title</b>	0EEPS551, Power System Lab-I
<b>Prerequisite/s</b>	---
<b>Teaching Scheme:</b> <b>Lecture/Tutorial/Practical</b>	0/0/4
<b>Credits</b>	02
<b>Evaluation Scheme: ISE / ESE</b>	25/50

**Course Educational Objectives(CEOs):**

The course aims to:

01	To allow students to practically verify several concepts and procedures learned in power system analysis.
02	To develop hands-on experience of how certain procedures of power system operation are carried out.
03	To Understand the performance of transmission line parameter with help of MATLAB ETAP and Power World Simulator.
04	To carry out system studies using power systems analysis software to assess system operation in steady state and under faulted conditions.

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS551_1	Write codes for to measure electrical parameters of transmission line. ( Level 6)
0EEPS551_2	Create a model in power world simulator ( Level 6)
0EEPS551_3	Solve and write codes in MATLAB for load flow problem using Gauss-Seidal and Newton-Raphson method. ( Level 6)
0EEPS551_4	Analyze the transient performance of transmission systems. ( Level 4)
0EEPS551_5	Analyze the performance of transmission line in MATLAB. ( Level 4)
0EEPS551_6	Evaluate problems of power systems in ETAP ( Level 5)

**List of Experiments:**

Sr. No	Title of Experiments
1.	MATLAB Primer
2.	Analyze the Transients on a Transmission Line
3.	Calculate Symmetrical Short Circuit on a Synchronous Machine
4.	Calculate Symmetrical Components from Unbalance Currents
5.	Calculate Unbalanced Voltages from Symmetrical Components
6.	Analyze the Transient Power-angle Curve for Synchronous Machine
7.	Calculate Equal area Criterion of power system
8.	Formulation and calculation of Y- bus matrix of a system using MATLAB.
9.	Solution of a load flow problem using Gauss-Seidal and Newton-Raphson method

  
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	using MATLAB.
10.	Symmetrical fault analysis of a 3-bus system using MATLAB.
11.	Determination of voltages sequence using MATLAB.
12.	Power flow analysis using power world simulator
13.	Building a One-Line Diagram using ETAP
14.	Balanced and Unbalanced load flow analysis using ETAP
15.	DC Load flow analysis using ETAP
16.	Hardware Design using Arduino


**Text Books:**

Sr. No	Title	Author	Publisher
01	Advanced Power System Analysis & Dynamics	L.P. Singh	New Age International Publishers
02	Power System Analysis	Grainger, J.J. and Stevenson, W. D.	Tata McGraw-Hill Edition
03	Computer Techniques and Models in Power Systems	K. Uma Rao	I.K. International Publishing House Pvt Ltd

**Reference Books:**

Sr. No	Title	Author	Publisher
01	Analysis of Faulted Power Systems	Paul.M. Anderson	IEEE Press Power Systems Engineering Series
02	Circuits Analysis of A.C. power system VOL-II	Edith Clarke	J. Wiley & sons, Incorporated, 1950
03	Computer methods in Power System Analysis	Stagg G.W. & E.L. Abiad	McGraw-Hill
04	Operation and Control in Power Systems	Prof. P. S. R. Murty	B.S. Publications

  
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**Course:**

<b>Class</b>	M. Tech, Sem.-I
<b>Laboratory Course Code and Course Title</b>	0EEPS552, Advanced Power System Protection
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Practical/Tutorial</b>	0/0/2
<b>Credits</b>	01
<b>Evaluation Scheme : ISE</b>	25/00

**Course Educational Objectives(CEOs):**

Laboratory practice aims to

1	To give practical awareness and acquaintance with construction, principle operation protective devices of the power system.
2	How to connect the relays and circuit breakers to a line.
3	To develop relay and circuit breaker settings for different conditions


**Course Outcomes (COs):**

On successful completion of laboratory practice, student will be able to,

0EEPS552_1	Interpret different Protection system components. (2 <sup>nd</sup> cognitive level)
0EEPS552_2	Compare different protection schemes. (2 <sup>nd</sup> cognitive level)
0EEPS552_3	Illustrate of different types of circuit breakers. (3 <sup>rd</sup> cognitive level)
0EEPS552_4	Discriminate of different types of relays. (5 <sup>th</sup> cognitive level)

**List of Experiments**

<b>Experiment No.</b>	<b>Title of Experiment</b>
1	Drawing sheet showing construction of Circuit Breakers.
2	Drawing sheet showing construction of generator protection schemes.
3	Drawing sheet showing construction of Transformer protection schemes.
4	To study electromechanical induction disc type relay
5	To plot time/current characteristic and study of electro-mechanical over current relay.
6	To plot different characteristic and study of Microprocessor over current relay.
7	Experimental study of Electromechanical over voltage relay.
8	Experimental study of Microprocessor Based over voltage Relay.

  
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9	Experimental study of Microprocessor Based over voltage Relay.
10	Experimental study of microprocessor based IMPEDANCE Relay.
11	Introduction to Power World Software for different relay and circuit breaker settings
12	Study of relay coordination in Power World simulator
13	Study of transient stability during faults in Power World simulator
14	Study of CT construction in detail & find out Ratio error and Phase angle error
15	Study of PT construction in detail & find out Ratio error and Phase angle error

  
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**Course Details:**

<b>Class</b>	M. Tech. (Electrical Power System) Sem.-II
<b>Course Code and Course Title</b>	<b>0EEPS507, Power System Planning and Reliability</b>
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	03/01
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To introduce the objectives of Power System Planning at Generation, Transmission and Distribution level.
02	To know about Load Forecasting Techniques based on time horizon perspective of power system.
03	To impart learning about Reliability concepts & Reliability models to determine power sector reliability with various techniques.
04	To understand the criteria of Generation Planning & determination of Generation Reliability based on Generator Model.
05	To explore the objectives of Transmission Expansion Planning and its Reliability.
06	To learn about various concepts related to Distribution Planning and determine Distribution Reliability.

**Course Outcomes (COs):**


Upon successful completion of this course, the student will be able to:

0EEPS507_1	Evaluate various aspects of power system planning. (Level 5)
0EEPS507_2	Use the basics of load forecasting that will be useful for engineering profession practice in the power sector operation. (Level 3)
0EEPS507_3	Understand the concepts of reliability and apply the various techniques to determine the reliability of power system operation and planning. (Level 2)
0EEPS507_4	Apply reliability models to determine the reliability of Generation, Transmission and Distribution Expansion planning. (Level 3)
0EEPS507_5	Evaluate the optimal power system model based on reliability. (Level 5)


**Course Contents:**

<b>Unit 1</b>	<b>Power System Planning:</b> Introduction, Objectives of Planning, Power system elements & structure, Power system planning issues, time horizon perspectives of power system studies, Short Term Planning, Medium Term Planning, Long Term Planning, Reactive Power Planning.	<b>06 Hrs.</b>
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<b>Unit 2</b>	<b>Load Forecasting:</b> Classification and Characteristics of Loads, approaches to load forecasting, Forecasting methodologies: i) Extrapolation, ii) Correlation, Energy forecasting, Peak Demand Forecasting, Weather Load Model, Weather Sensitive and Non-Weather Sensitive Load Forecasting, Total Forecast.	<b>08 Hrs.</b>
<b>Unit 3</b>	<b>Reliability:</b> Reliability concepts, General Reliability Function, Simple Series and parallel Models, Reliability Evaluation Techniques: i) Markov Chains and Processes ii) Recursive Techniques, Adequacy of reliability, Reliability Costs.	<b>07 Hrs.</b>
<b>Unit 4</b>	<b>Generation Planning &amp; Reliability:</b> Generation Resources, Factors affecting generation planning, Generation system model, Loss of Load, Outage, Loss of Energy, Reliability based generation system, Reliability analysis of Isolated & Interconnected System, Generator system cost analysis.	<b>07 Hrs.</b>
<b>Unit 5</b>	<b>Transmission Planning &amp; Reliability:</b> Introduction, Objectives, Transmission Expansion Planning, Transmission System Reliability Model Analysis, Determination of Reliability indices like LOLP, Average Interruption Rate Method.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Distribution Planning &amp; Reliability:</b> Introduction, Overview of Distribution system expansion planning, Design consideration of primary and secondary distribution, Distribution system voltage regulation, distribution system protection & coordination of protective devices, Distribution reliability indices, parallel & meshed networks and Effect of Protection failure.	<b>08 Hrs.</b>

<b>Text Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	Power System Planning	R.L. Sullivan	McGraw Hill International Book Co
02	Electrical Power System Planning	A.S. Pabla	Macmillan
03	Electric Power System Planning: Issues, Algorithms and Solutions	Hossein Seifi Mohammad Sadegh Sepasian	Springer
04	Power System Reliability Evaluation	Roy Billington	Gordan & Breach Scain Publishers,

  
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Reference Books:			
Sr. No	Title	Author	Publisher
01	Modern Power System Planning	X. Wang, J.r. McDonald	McGraw Hill Int. Ed.
02	Power Generations, Operation & Control	Allen J. Wood, B.F. Wollenberg	Wiley India, Reprint

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem. II
<b>Course Code and Course Title</b>	0EEPS508, <b>High Voltage Engineering</b>
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	3/0
<b>Credits</b>	03
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Educational Objectives(CEOs):**

The course aims to:

01	Introduce basic knowledge about High Voltage Engineering
02	Explain the concept related to ionization process and its theories
03	Explain process of breakdown in Gaseous, Liquid and Solids
04	Illustrate generation and Measurement of High Voltages and Current
05	Describe insulation Co-ordination. Over voltage phenomenon
06	Explain High Voltage Testing of Electrical Equipment

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS508_1	Understand the concepts related to electrostatic field stress (Cognitive Level 2)
0EEPS508_2	Illustrate electrical breakdown in air, solid and liquid insulation (Cognitive Level 3)
0EEPS508_3	Analyze generation of High voltage and High current. (Cognitive Level 4)
0EEPS508_4	Demonstrate and analyze measurement of High voltage and High current for testing purposes (Cognitive Level 4)
0EEPS508_5	Testing and analyzing of Insulation coordination, over voltage and transient in power system (Cognitive Level 5)
0EEPS508_6	Analyze high voltage test on various electrical equipment (Cognitive Level 4)

**Course Contents**

Unit 1	<b>Electric Stress Estimation and Control:</b> Electrical field distribution and breakdown strength of insulating materials - fields in homogeneous, isotropic materials - fields in multi-dielectric, isotropic materials - numerical method: Finite difference method, charge simulation method (CSM), Control of Electric Field Intensity	4Hrs
	<b>Breakdown Mechanism of Gaseous, Liquid and Solid Materials</b> Gases as insulating media - ionization and decay processes, Townsend first	

  
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Unit 2	ionization coefficient, photo-ionization, photoelectric emission, thermionic emission, Townsend second ionization coefficient, the Townsend mechanism, Paschen's law, Liquid as insulators, breakdown in liquids - electronic breakdown, suspended solid particle mechanism, cavity breakdown, Breakdown in solids, intrinsic breakdown, streamer breakdown, electromechanical breakdown, breakdown due to treeing & tracking, thermal breakdown, solid dielectrics used in practice.	9Hrs
Unit 3	<b>Generation of high voltages and Current:</b> Generation of high direct voltages, half and full wave rectifier circuits, voltage multiplier circuits, Cockcroft-Walton Voltage Multiplier Circuit working, Van de Graff generators, electrostatic generators, generation of alternating voltages, cascaded transformers, resonant transformers- series, parallel, impulse voltages, Standard lightning and switching surge, impulse voltage generator circuits, Analysis of circuit "a", Marx circuit, operation, impulse current generator.	7Hrs
Unit 4	<b>Measurement of high Voltages and Current:</b> High direct voltage measurement, peak voltage measurements by spark gaps, sphere gaps, reference measuring systems, uniform field gaps, rod gaps, factors affecting sphere gap measurements, electrostatic voltmeters, generating voltmeters and field sensors, Potential Dividers for Impulse Voltage Measurements- resistance & Capacitance voltage divider, Measurement Of High D.C., A.C. And Impulse Currents- hall generators, Rogowski coil, Faraday Generator, the measurement of peak voltages, the Chubb-Fortescue method, Surge Recorder (Klydonograph) with Lichtenberg Pattern.	9Hrs
Unit 5	<b>Transient in Power System, insulation coordination &amp; Non-destructive insulation tests:</b> Transients in simple Circuit, Capacitance Switching, Natural causes for over voltages, Lightning phenomenon, Overvoltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems, Measurement of d.c. resistivity, dielectric loss and Loss factor, The Partial Discharge-internal & external, Equivalent Circuit.	7Hrs
Unit 6	High voltage testing of Electrical Equipment: Testing of insulators and bushings, testing of isolators and circuit breakers Testing of cables, testing of transformers - testing of surge diverters	6Hrs

**Text Books:**

Sr. No	Title	Author	Publisher
01	High Voltage Engineering	M.S.Naidu and V. Kamaraju	TMH Publications

  
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<b>Reference Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
1	High Voltage Engineering: Fundamentals: E. Kuffel	E. Kuffel, W.S. Zaengl, J. Kuffel	Elsevier
2	High Voltage Engineering	C.L. Wadhwa	New Age International (P) Limited
3	High Voltage Insulation Engineering	Ravindra Arora Wolfgang Mosch	New Age International (P) Limited

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem. – II
<b>Course Code and Course Title</b>	0EEPS509, Power System Operation and Deregulation
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	3/1
<b>Credits</b>	4
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To apply generation dispatch is optimally.
02	To apply power flows optimally to run the system without violating constraints.
03	To propose restructuring of power system.
04	To apply forecasting methods to operate the system.
05	To apply unit commitment method to run power system economic manner.
06	To propose the different problem management method in deregulated electricity market.

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS509_1	Apply generation dispatch economically in power system. (3 <sup>rd</sup> cognitive level)
0EEPS509_2	Apply power flows optimum manner. (3 <sup>rd</sup> cognitive level)
0EEPS509_3	Propose the deregulated power system and different electricity markets. (3 <sup>rd</sup> cognitive level)
0EEPS509_4	Apply forecasting methods to estimate load and price. (5 <sup>th</sup> cognitive level)
0EEPS509_5	Apply unit commitment methods to operate power system economically. (3 <sup>rd</sup> cognitive level)
0EEPS509_6	Apply various methods congestion management & ancillary service to operate power system in deregulated environment. (3 <sup>rd</sup> cognitive level)

**Course Contents:**

<b>Unit 1</b>	<b>Economic operation of power system:</b> Introduction, Generator operating cost, performance curves, economic dispatch neglecting loss, economic dispatch including generator limits, losses, B matrix loss formula, calculating penalty factors,	<b>07 Hrs.</b>
<b>Unit 2</b>	<b>Optimal power flow:</b> Introduction, solution of optimal power flow, linear sensitivity analysis, and security constrained optimal power flow.	<b>06 Hrs.</b>
<b>Unit 3</b>	<b>Restructured power systems:</b> Deregulation: Concepts and evaluation, need for deregulation, Competition and direct access to market, Independent system	<b>07 Hrs.</b>

  
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	operator(ISO), study of deregulation from UK, Norway, New Zealand, whole sale electricity market	
<b>Unit 4</b>	<b>Short time load &amp; Price forecasting:</b> Load forecasting introduction, time series data, simple forecast using mean, short time load forecasting by ANN, transmission pricing in open access, price forecasting,	<b>07 Hrs.</b>
<b>Unit 5</b>	<b>Unit commitment:</b> Unit commitment, constraints in unit commitment, unit commitment solution methods, and price based unit commitments, security constraint base unit commitment.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Congestion management &amp; Ancillary services:</b> Introduction to congestion management, cost allocation methods, LMP, FTR and zonal congestion management, general description of ancillary services, ancillary service management, Electricity Bill 2003 and its impact on ESI in India	<b>07 Hrs.</b>

<b>Text Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	Power system operation & control	K. Uma rao	Wiley India
02	Power generation, operation & control	Allen J Wood, Bruce F. Wollenberg	Wiley India
03	Power system Restructuring & deregulation	LOI LEI LAI	John Wiley & Sons
04	Power system Forecasting, Scheduling and risk management	MahammadShahidepour, HatimYamin, Zuyi Li	IEEE & Wiley
05	Operation of the restructured power system	KankarBattacharya, Math H J Bollen, Jaap E Daalder	Springer Science

<b>Reference Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	Operation & Control in power system	P S R Murty	BS Publication
02	Electrical Power Generation, Transmission & Distribution	S N Singh	PHI learning PVT LTD
03	Understanding Electrical Utilities & Deregulation	LorrinPhillipson, H Lee Willis	Taylor & Francis

  
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**Course Details:**

<b>Class</b>	M. Tech. Sem.-II
<b>Course Code and Course Title</b>	0EEPS510, Electrical Power Quality and Harmonics
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	03/01
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To get familiar with power quality issues.
02	To gain knowledge of harmonics and their sources
03	To suppress harmonics through active and passive filters.
04	To mitigate voltage sags and interruptions.
05	To learn harmonic measurement and power quality monitoring techniques.
06	To learn harmonic limits set by different regional bodies.

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS510_1	Describe different power quality related issues, causes and their effects on power system equipment. (Level 2).
0EEPS510_2	Classify the harmonic in three phase and single phase circuit. (Level 4).
0EEPS510_3	Design the filter for suppression of current harmonics. (Level 6).
0EEPS510_4	Distinguish the different methods for mitigation of voltage sags and interruptions. (Level 4).
0EEPS510_5	Evaluate the different power quality monitoring techniques. (Level 5).

**Course Contents:**

<b>Unit 1</b>	<b>Introduction to power quality:</b> What is power quality, power quality related issues in distribution system, loads and their characteristics, electromagnetic phenomena, power quality evaluation procedure,	<b>06 Hrs.</b>
<b>Unit 2</b>	<b>Voltage sag, interruptions and mitigation:</b> End user issues, ups system, Ferro-resonant transformers, super conducting storage devices, dynamic voltage restorer and application of DSTATCOM.	<b>08 Hrs.</b>
<b>Unit 3</b>	<b>Wiring and grounding:</b> Reasons for grounding, typical wiring and grounding problem, solution to wiring and grounding problem.	<b>07 Hrs.</b>
<b>Unit 4</b>	<b>Power quality monitoring:</b>	<b>07 Hrs.</b>

  
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	Monitoring considerations, power quality measurement equipment, and assessment of power quality, power quality monitoring and standard.	
<b>Unit 5</b>	<b>Fundamentals of harmonics:</b> Sources of harmonics, effect of harmonics, types and characterization, THDs, influence on power factor, interference with communication network, harmonic indices, and synthesis of harmonic waveform originating from non-linear loads with the help of Fourier analysis. Power definitions and components-single phase circuits and three phase circuits.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Harmonic suppression filters:</b> Shunt passive filters, design considerations case studies, voltage/ current source active filters- types: shunt, series and hybrid types, comparison.	<b>08 Hrs.</b>

**Text Books:**

Sr. No	Title	Author	Publisher
01	Electrical Power System Quality	Roger C. Dugan, Mark F. McGranaghan, Surya Snatoso, H. Wayne Beaty	Tata McGraw -Hill
02	Electrical Power System Quality	J. Arnillaga , D A Bradey& P S Bodger	John Wiley Sons
03	Power System Harmonics	George J. Wakileh	Springer


**Reference Books:**

Sr. No	Title	Author	Publisher
01	Uninterrupted Power Supplies and Active filters	Ali Emadi, AbdolhorienNasiri & Stoyon B Bekiarov	CRC Press

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem. II
<b>Course Code and Course Title</b>	<b>0EEPS511, Supervisory Control and Data Acquisition &amp; Automation</b>
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	3/01
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To impart knowledge on Process automation
02	To create expertise in the field of process automation using PLC, DCS and SCADA. Program Outcomes
03	To understand the generic architecture and constituent components of a Programmable Logic Controller.
04	To develop architecture of SCADA explaining each unit in detail.
05	To develop a software program using modern engineering tools and technique for SCADA.
06	To apply knowledge gained about PLCs and SCADA systems to identify few real-life industrial applications.

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS511_1	Select the appropriate controller for a particular application(Cognitive Level 6)
0EEPS511_2	Develop and explain the working of PLC with the help of a block diagram. (Cognitive Level 2)
0EEPS511_3	Designing various controllers used in the industries. (Cognitive Level 6)
0EEPS511_4	Develop architecture of SCADA and explain the importance of SCADA in critical infrastructure. (Cognitive Level 4)
0EEPS511_5	Execute, debug and test the programs developed for digital and analog operations. (Cognitive Level 5)
0EEPS511_6	Reproduce block diagram representation on industrial applications using PLC and SCADA. (Cognitive Level 6)

**Course Contents:**

<b>Unit 1</b>	<b>Automation Fundamentals</b> Automation and its importance, automation applications, expectations of automation. Types of plant and control – categories in industry, open loop and close loop control functions, continuous processes, discrete processes, and mixed processes. Automation hierarchy – large control system hierarchy, data quantity & quality and hierarchical control. Control system architecture – evolution and current trends, comparison of different architectures.	<b>05 Hrs.</b>
<b>Unit 2</b>	<b>Programmable Logic Controller</b> Hardware Evolution of PLC,	<b>08 Hrs.</b>

  
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	<p>Definition, functions of PLC, Advantages, Architecture, working of PLC, Scan time, Types &amp; Specifications. DI-DO-AI-AO examples and ratings, I/O modules, local and remote I/O expansion, special purpose modules, wiring diagrams of different I/O modules, communication modules, Memory &amp; addressing memory organization (system memory and application memory), I/O addressing, hardware to software interface. Software- Development of Relay Logic Ladder Diagram, introduction to PLC Programming, programming devices, IEC standard PLC programming languages, LD programming- basic LD instructions, PLC Timers and Counters: Types and examples, data transfer &amp; program control instructions, advanced PLC instructions, PID Control using PLC</p>	
<b>Unit 3</b>	<p><b>Applications of PLC</b>  <b>PLC interface to various circuits :</b> Encoders, transducer and advanced sensors (Thermal, Optical, Magnetic, Electromechanical, Flow, Level sensors) Measurement of temperature, flow, pressure, force, displacement, speed, level. Developing a ladder logic for Sequencing of motors, Tank level control, ON OFF temperature control, elevator, bottle filling plant, car parking  <b>Motors Controls:</b> AC Motor starter, AC motor overload protection, DC motor controller, Variable speed (Variable Frequency) AC motor Drive.</p>	<b>07 Hrs.</b>
<b>Unit 4</b>	<p><b>Distributed Control System</b>  Introduction to DCS – Evolution of DCS, DCS flow sheet symbols, architecture of DCS – controller, Input and output modules, communication module, data highway, local I/O bus, workstations, specifications of DCS. Introduction to Hierarchical Control and memory: Task listing, Higher &amp; Lower Computer level tasks. Supervisory computer tasks and DCS configuration –Supervisory Computer functions, Control techniques, Supervisory Control Algorithm, DCS &amp; Supervisory Computer displays, advanced control Strategies, Computer interface with DCS. DCS – system integration with PLCs and computer: Man machine interface- sequencing, supervisory control, and integration with PLC, personal computers and direct I/O, serial linkages, network linkages, links between networks.</p>	<b>09Hrs.</b>
<b>Unit 5</b>	<p><b>SCADA System</b>  Introduction, definitions and history of Supervisory Control and Data Acquisition, typical SCADA system Architecture, Communication requirements, Desirable Properties of SCADA system, features, advantages, disadvantages and applications of SCADA. SCADA Architectures (First generation - Monolithic, Second generation - Distributed, Third generation – Networked Architecture), SCADA systems in operation and control of interconnected power system, Power System Automation (Automatic substation control and power distribution ), Petroleum Refining Process, Water Purification System, Chemical Plant.</p>	<b>09 Hrs.</b>

  
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<b>Unit 6</b>	<b>SCADA Protocols</b> Open systems interconnection (OSI) Model, TCP/IP protocol, DNP3 protocol, IEC61850 layered architecture, Control and Information Protocol (CIP), Device Net, Control Net, Ether Net/IP, Flexible Function Block process (FFB), Process Field bus (Profibus). Interfacing of SCADA with PLC.	<b>04 Hrs.</b>
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**Text Books:**

Sr. No	Title	Author	Publisher
01	Introduction to Programmable Logic Controllers	Gary Dunning	Thomson
02	Programmable Logic Controllers Programming Methods and Applications	John R. Hackworth	PHI Publishers
03	Programmable Logic Controllers: Principles and Application", PHI Learning, New Delhi	John W. Webb, Ronald A. Reis	--
04	Securing SCADA System	Ronald L. Krutz	Wiley Publications
05	SCADA supervisory control and data acquisition	Stuart A Boyer	ISA
06	Switchgear and Protections	Sunil S. Rao	--
07	Programmable Controllers Theory and Implementation	L.A. Bryan, E. A. Bryan	Industrial Text Company Publication

**Reference Books:**

Sr. No	Title	Author	Publisher
01	Programmable Controllers	Batten G. L	McGraw Hill Inc
02	Real Time Computer Control	Bennett Stuart	Prentice Hall
03	Measurement Systems	Doebelin E. O.	McGraw-Hill International Editions
04	Practical Modern SCADA Protocols	Gordan Clark, Deem Reynders	ELSEVIER
05	Computer Based Industrial Control	Krishna Kant	PHI
06	Computer Control of Process	M. Chidambaram	Narosha Publishing
07	Programmable Logic Controllers with Applications	P. K. Srivstava	BPB Publications
08	Distributed Computer Control for Industrial Automation	Poppovik, Bhatkar	Dekkar Publications
09	Computer Aided Process Control	S. K. Singh,	PHI

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem. – II
<b>Course Code and Course Title</b>	0EEPS512, <b>Real Time Control of Power Systems</b>
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	3/1
<b>Credits</b>	4
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To introduce real time systems to monitor power system.
02	To propose generation control to maintain frequency.
03	To propose optimal control method to select hydro & thermal plant.
04	To apply reactive control methods to maintain voltage.
05	To propose state estimation application to power system.
06	To introduce SCADA.

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS512_1	Apply analytical methods to process data and monitor system. (3 <sup>rd</sup> cognitive level)
0EEPS512_2	Design and apply automatic generation control to maintain frequency. (5 <sup>th</sup> cognitive level)
0EEPS512_3	Schedule hydro thermal generation optimally using different control methods. (3 <sup>rd</sup> cognitive level)
0EEPS512_4	Design various reactive control methods to maintain voltage within limits. (5 <sup>th</sup> cognitive level)
0EEPS512_5	Apply state estimation techniques to power system. (3 <sup>rd</sup> cognitive level)
0EEPS512_6	Describe SCADA for power system application. (3 <sup>rd</sup> cognitive level)

**Course Contents:**

<b>Unit 1</b>	<b>Analytical Methods:</b> Modeling and identification of power system components, real time data processing, real time monitoring using phasor measurement	<b>06 Hrs.</b>
<b>Unit 2</b>	<b>Automatic generation (Load frequency) control:</b> Objectives, tie line bias control, flat frequency control, supplementary control, interconnected areas, two area, three area systems, state variable model for single, two and three area cross coupling between control loops, AVG, AVR, Application of modern control theory, application of artificial intelligence, AGC using Kalman methods.	<b>07 Hrs.</b>
<b>Unit 3</b>	<b>Optimal control of Hydro – thermal Generation:</b> Generation mix, optimum economic dispatch, optimum generation allocation solution techniques for optimum power flow such as gradient	<b>07 Hrs.</b>

  
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	Newton's linear programming, nonlinear programming methods such as Dommel, Tinney, EL Abiad- James. Dynamic programming methods fuel scheduling using linear programming. Hydro thermal scheduling short range and long range dynamic programming, scheduling problems Kirchmayers method of coordinate equation.	
<b>Unit 4</b>	<b>Reactive power control:</b> Need for adjustable reactive power, excitation control, tap changing transformers, fundamental concept of series and dynamic shunt compensation, principles of static compensator and applications automatic power factor controlling schemes.	<b>07 Hrs.</b>
<b>Unit 5</b>	<b>State estimation:</b> Power system state estimation least square estimation of A.C networks, estimation by orthogonal decomposition, and application of state estimation to power systems.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>SCADA and DAS:</b> Power system security, contingency analysis energy control, centralized and decentralized control, SCADA systems, and recent trends on real time operations. Substation automation, remote metering, energy audit reconfiguration of distribution networks under normal conditions for loss minimization and restoration of distribution systems	<b>07Hrs.</b>


**Text Books:**

Sr. No	Title	Author	Publisher
01	Real time control of electric power system	E. Handschiw	IEEE Press
02	Recent trends in electric energy system	J.Nanda and D.P.Kothari	S Chand
03	Computer aided system analysis and control	Mahalanable Kothari	S Chand
04	Power operation and control	P.S.R.Murthy	BS Publication
05	Electric energy systems theory an introduction	Olle .I.Elgerd	Tata Hill
06	Power generation operation and control	Wood, Wollenberg	Wiley India

**Reference Books:**

Sr. No	Title	Author	Publisher
01	Reactive power control of electric power system	J.E.Miller	--
02	Electric power distribution	A.S.Pable	Tata Hill
03	Automatic electric utility	G.A.Gnadt and	--

  
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**Reference Books:**

Sr. No	Title	Author	Publisher
	distribution systems	J.S.Lawler	
04	Power system operation & control	K. Uma rao	Wiley India

  
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**Course Details:**

<b>Class</b>	M. Tech. (Electrical Power System) Sem.-II
<b>Course Code and Course Title</b>	<b>0EEPS513, Flexible AC Transmission and High Voltage DC System</b>
<b>Prerequisite/s</b>	---
<b>Teaching Scheme: Lecture/Tutorial</b>	03/01
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To introduce what is reactive power and what are the FACTS devices.
02	To Describe and compare Shunt and Series FACTS Devices
03	To evaluate the performance of various control schemes of combined shunt and series compensators.
04	To Understand the concepts of High Voltage Direct Current Systems
05	To analyze voltage & current characteristics for different converters and correlate with actual HVDC systems.
06	Calculate Reactive Power Requirement of HVDC Converter

**Course Outcomes (COs):**

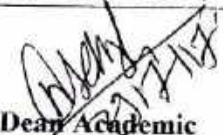
Upon successful completion of this course, the student will be able to:

0EEPS513_1	Compare all FACTS devices (Level 4)
0EEPS513_2	Apply the control schemes for series and shunt compensating devices (Level 3)
0EEPS513_3	Analyze the performance of various control schemes of combined shunt and series compensators. (Level 4)
0EEPS513_4	Evaluate performance of TCVR, TCPAR (Level 5)
0EEPS513_5	Analyze the working principles and constructions of HVDC Converters, Filters, Protection etc. (Level 4)
0EEPS513_6	Analyze voltage & current characteristics for different converters and correlate with actual HVDC systems. (Level 4)

**Course Contents:**

<b>Unit 1</b>	<b>FACTS Concept and General, System Considerations:</b> Transmission Interconnections, What Limits the Loading Capability, Power flow in AC Systems, Basic Types of FACTS Controllers, Power Flow and Dynamic Stability Considerations of a Transmission Interconnection, Benefits from FACTS Technology, Compare HVDC and FACTS	<b>06 Hrs.</b>
<b>Unit 2</b>	<b>Static Shunt and Series Compensators:</b> Objectives of Shunt Compensation, Operation & Control Scheme of TSC, & TCR, FC-TCR, TSC-TCR, STATCOM, Objectives of Series	<b>09 Hrs.</b>

  
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	Compensation, GCSC, TSSC, TCSC, Static Synchronous Series Compensator (SSSC)	
<b>Unit 3</b>	<b>Combined Compensator:</b> TBSC, TBSR, TBSC-TBSR, UPFC and IPFC. Their advantages and disadvantages.	<b>06 Hrs.</b>
<b>Unit 4</b>	<b>General Background of HVDC and MTDC System:</b> General aspects HVDC Transmission, Constitution of EHVAC and DC links, Kinds of DC links, HVDC projects in India and abroad, limitations and advantages of HVDC transmission over EHVAC, Layout of HVDC station. Types of MTDC Systems, Reversal of Power in MTDC System, Comparison between MTDC and AC Interconnections.	<b>07 Hrs.</b>
<b>Unit 5</b>	<b>Grid Control and Characteristics:</b> Grid control of thyristor, valve-Analysis with grid control with no overlap, overlap less than 60 degrees and overlap greater than 60 degrees. Basic means of control, Power reversal, manual control and its limitations-constant current versus constant voltage Control, desired features of control, actual control characteristics-constant minimum ignition angle, current and extinction angle controls –power control and current limits.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Protection:</b> Disoperation of converters-short circuit on a rectifier commutation failure, causes and remedies, Protection of HVDC system, d.c. reactors, Over current protection and over-voltage protection, fault clearing and reenergizing the line.	<b>08 Hrs.</b>

<b>Text Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	Understanding FACTS	Narain G. Hingorani	IEEE Press
02	EHVAC and HVDC Transmission Engineering and Practice	S. Rao	Khanna publication
03	HVDC power transmission systems	K R Padiyar	New Age International (p)Ltd

<b>Reference Books:</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
01	Direct Current Transmission	Edward Wilson Kimbark	Wiley publication Inter science

  
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**Research Papers:**

1. Maffrand, J. W. Dixon, and L. Morán, *"Binary controlled, static VAR compensator, based on electronically switched capacitors,"* in Proc. IEEE PESC'98, pp.1392–1396, 1998.
2. J. W. Dixon, Y. Del Valle, M. Orchard, M. Ortizar, L. Moran and C. Maffrand, *"A full compensating system for general loads based on a combination of thyristor binary compensator and a PWM-IGBT active power filter,"* IEEE Trans. Ind. Electron., Vol. 50, No. 5, pp982-989, Oct. 2003.
3. Swapnil D. Patil, Anwar M. Mulla, U. Gudar, D. R. Patil, *Member IAENG. "An Innovative Transient Free TBSC Compensator with Closed Loop Control for Fast Varying Dynamic Load"*, Proceedings of WCECS 2014, Vol I 23-25 October, 2014, San Francisco, USA.
4. S. R. Lokhande, Swapnil D. Patil, Anwar M. Mulla and D. R. Patil, *"Introduction to FC-TBSR Based SVC for Voltage Regulation and Reactive Power Compensation"*, IEEE Volume 8 Issue 01 Jan.-June 2016, pp. 963-968.

  
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**Course Details:**

Class	M. Tech. (Electrical Power System) Sem.-II
Course Code and Course Title	0EEPS514, Optimization Techniques
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial	03/01
Credits	04
Evaluation Scheme: ISE / MSE / ESE	20/30/50

**Course Objectives:**

01	Student must be Understand the Introduction optimization theory
02	Student must be Apply Linear Programming problem theory
03	Student must be Apply theory to nonlinear programming
04	Student must be Constrained optimization
05	Student must be Create System Modeling
06	Student must be Apply Conventional tools for linear system modeling

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

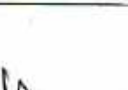
0EEPS514_1	Understand the Introduction optimization theory. (Level 2)
0EEPS514_2	Apply Linear Programming problem theory. (Level 3)
0EEPS514_3	Apply theory to nonlinear programming. (Level 3)
0EEPS514_4	Evaluate the Constrained optimization. (Level 5)
0EEPS514_5	Design System Modeling. (Level 6)
0EEPS514_6	Apply Conventional tools for linear system modeling. (Level 3)

**Course Contents:**

<b>Unit 1</b>	<b>Optimization Theory:</b> Introduction to optimization theory, Importance in solving system engineering problems, Convex sets & Functions; affine and convex sets, supporting and separating hyper planes, dual cones and generalized inequalities.	<b>06 Hrs.</b>
<b>Unit 2</b>	<b>Linear Programming problem:</b> Formulation, Simplex Method, Dual Simplex method, sensitivity analysis, duality in programming, transportation and assignment problems, traveling salesman problem.	<b>07 Hrs.</b>
<b>Unit 3</b>	<b>Introduction to nonlinear programming;</b> Unconstrained Optimization-formulation of quadratic optimization problems, Kuhn-Tucker conditions, gradient descent and steepest descent methods, Newton's method, self-concordance.	<b>08 Hrs.</b>
<b>Unit 4</b>	<b>Constrained optimization:</b> Direct optimization, Cutting plane methods, methods of feasible direction, analytic center cutting plane methods.	<b>08 Hrs.</b>

  
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	Multi-objective optimization, Application to approximation and filling problems, Dynamic Programming.	
<b>Unit 5</b>	<b>System Modeling:</b> Introduction, types of modeling, modeling of time-varying, distributed, stochastic, nonlinear, discrete event and hybrid systems.	<b>06 Hrs.</b>
<b>Unit 6</b>	<b>Conventional tools for linear system modeling:</b> Introduction to non-conventional modeling tools, Neural models, fuzzy models, Model simulation languages and tools.	<b>07 Hrs.</b>

**Text Books:**

Sr. No	Title	Author	Publisher
1	Optimization theory and applications	S S Rao	Wiley Eastern Ltd.
2	Optimization methods	K V Mittal	Wiley Eastern Ltd.
3	Interactive Dynamic System Simulation	Korn G.A	McGraw Hill, N.Y.
4	Introduction to Optimization	J.C. Pant	Jain Brothers


**Reference Books:**

Sr. No	Title	Author	Publisher
1	System modeling and computer simulation	NA Kheir	Marcel Decker, New York

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem.-II
<b>Course Code and Course Title</b>	<b>0EEPS515, Power Systems transient Analysis</b>
<b>Prerequisite/s</b>	-----
<b>Teaching Scheme: Lecture/Tutorial</b>	3/1
<b>Credits</b>	04
<b>Evaluation Scheme: ISE / MSE / ESE</b>	20/30/50

**Course Objectives:**

01	To study the generation of switching transients and their control using circuit – theoretical concept.
02	To study the mechanism of lightning strokes and the production of lightning surges.
03	To study the propagation, reflection and refraction of travelling waves.
04	To study the impact of voltage transients caused by faults, circuit breaker action, load rejection on integrated power system.
05	To understand the transient causes and effect of transients on power systems

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS515_1	Explain the propagation, reflection and refraction of travelling waves. (Level 2)
0EEPS515_2	Describe the causes of transients. (Level 2)
0EEPS515_3	Analyze the impact of voltage transients caused by faults, circuit breaker action, and load rejection on integrated power system. (Level 4)
0EEPS515_4	Analyze the switching and lightning transients. (Level 4)
0EEPS515_5	Evaluate the transient response of systems. (Level 5)
0EEPS515_6	Compare mechanism of lightning discharges and characteristics of lightning strokes. (Level 4)

**Course Contents:**

Unit 1	<b>Introduction And Survey:</b> Source of transients, various types of power systems transients, effect of transients on power systems, importance of study of transients in planning.	05 Hrs.
Unit 2	<b>Transient and Types:</b> RL circuit transient with sine wave excitation - double frequency transients – basic transforms of the RLC circuit transients. Different types of power system transients - effect of transients on power systems – role of the study of transients in system planning.	07 Hrs.
Unit 3	<b>Switching Transients:</b> Over voltages due to switching transients - resistance switching and the equivalent circuit for interrupting the resistor current - load switching and	09 Hrs.

  
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	equivalent circuit - waveforms for transient voltage across the load and the switch - normal and abnormal switching transients. Current suppression - current chopping - effective equivalent circuit. Capacitance switching - effect of source regulation - capacitance switching with a restrike, with multiple restriks. Illustration for multiple re-striking transients – Ferro resonance.	
Unit 4	<b>Lightning Transients:</b> Review of the theories in the formation of clouds and charge formation - rate of charging of thunder clouds – mechanism of lightning discharges and characteristics of lightning strokes – model for lightning stroke - factors contributing to good line design – protection using ground wires - tower footing resistance - Interaction between lightning and power system.	07 Hrs.
Unit 5	<b>Traveling Waves On Transmission Line Computation Of Transients:</b> Computation of transients - transient response of systems with series and shunt lumped parameters and distributed lines. Traveling wave concept - step response - Bewely's lattice diagram - standing waves and natural frequencies - reflection and refraction of travelling waves.	07 Hrs.
Unit 6	<b>Transients In Integrated Power System:</b> The short line and kilometric fault - distribution of voltages in a power system – Line dropping and load rejection - voltage transients on closing and reclosing lines – over voltage induced by faults - switching surges on integrated system. Qualitative application of EMTP for transient computation.	07 Hrs.

Reference Books:			
Sr. No	Title	Author	Publisher
01	'Electrical Transients in Power Systems'	Allan Greenwood	Wiley Interscience New York
02	'Extra High Voltage AC Transmission Engineering'	R.D.Begamudre	Wiley Eastern Limited
03	'High Voltage Engineering'	M.S.Naidu and V.Kamaraju	Tata McGraw Hill

  
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**Course Details**

<b>Class</b>	M. Tech, Sem.-II
<b>Course Code and Course Title</b>	0EEPS516, Research Methodology
<b>Prerequisite/s</b>	--
<b>Teaching Scheme: Lecture/Tutorial</b>	2/0
<b>Credits</b>	--
<b>Evaluation Scheme:</b>	GRADE

**Course Objectives:** The course aims to

<b>1</b>	Provide depth knowledge of research methods and ethics, from design to data analysis and report writing.
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**Course Outcomes (COs)**

Upon successful completion of this course, the student will be able to:

0EEPS516_1	Define research, explain and apply research terms, describe the research process and the principle activities, skills and ethics associated with the research process. (2 <sup>nd</sup> cognitive level)
0EEPS516_2	Explain the relationship between theory and research. (2 <sup>nd</sup> cognitive level)
0EEPS516_3	Describe and compare the major quantitative and qualitative research method. (2 <sup>nd</sup> cognitive level)
0EEPS516_4	Propose a research study and justify the theory as well as methodological decisions including sampling and measurement. (5 <sup>th</sup> cognitive level)
0EEPS516_5	Summarize the importance of research ethics and integrate it into research process. (2 <sup>nd</sup> cognitive level)
0EEPS516_6	Construct an effective research proposal that will serve as the launching point for the further study. (6 <sup>th</sup> cognitive level)

**Course Contents**

<b>Unit 1</b>	<b>Research methodology an Introduction:</b> Meaning ,objectives and motivation of research , Types of research , research approaches , significance of research , research methods vs. methodology , research and scientific methods ,Importance of knowing how research is done , Research process , Criteria of good research , Problem encountered by researchers in India	<b>04 Hrs.</b>
<b>Unit 2</b>	<b>Defining the research problem and research design</b> Selecting the problem, Techniques involved in defining the problem , meaning and need of research design , features of good design , important concepts relating to research design , different research designs , Basic concepts of experimental designs	<b>03 Hrs.</b>
<b>Unit 3</b>	<b>Sampling design :</b> Census and sample survey , Implications of sample design , Steps in sampling design ,Criteria of selecting sampling procedure ,Characteristics of good sample design ,Different types of sample designs, Random sample	<b>03Hrs.</b>

  
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	from an infinite universe , Complex random sampling designs	
<b>Unit 4</b>	<b>Measurement and scaling techniques:</b> Measurement in research , measurement scales , Sources of error in measurement ,Tests of sound measurement , Technique of developing measurement Tools , scaling, meaning of scaling ,sale classification bases , Important scaling Techniques , scale construction Techniques	<b>02 Hrs.</b>
<b>Unit 5</b>	<b>Sampling fundamentals:</b> Need of sampling , Important sampling distribution, central limit theorem ,sampling theory , Sandler's A-Test ,Concept of standard error ,Estimation , Estimating the population mean , Estimating Population Proportion , Sample Size and its Determination , Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level, Determination of Sample Size through the Approach Based on Bayesian Statistics	<b>03 Hrs.</b>
<b>Unit 6</b>	<b>Testing of Hypothesis-I and II:</b> Basic concept of Testing of Hypotheses , Procedure for hypothesis testing , measuring the power of hypothesis test ,Flow diagram of hypothesis testing ,Important parametric tests , Hypothesis testing of means , Testing the Equality of Variances of Two Normal Populations , Hypothesis Testing of Correlation Coefficients , Limitations of the Tests of Hypotheses, Hypothesis –II , Important Nonparametric or Distribution-free Test ,Relationship between Spearman's r's and Kendall's, Characteristics of Distribution-free or Non-parametric Tests	<b>05 Hrs.</b>
<b>Unit 7</b>	<b>Interpretation and report writing:</b> Meaning of interpretation, Why Interpretation?, Techniques of interpretation , Precaution in interpretation , Significance of report writing , Different steps in writing report ,Layout of research report ,Types of reports ,Oral presentation ,Mechanism of writing research report , Precaution for writing research reports	<b>02 Hrs.</b>
<b>Unit 8</b>	<b>Introduction to LaTeX:</b> Understanding Latex compilation, Basic Syntax, Writing equations, Page Layout.	<b>02 Hrs.</b>

<b>Text Books</b>			
<b>Sr. No.</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
1	Research Methodology: Methods and Techniques	C. R. Kothari	New Age International
2	Research Methodology concepts and cases	Deepak Chawla Neena Sondhi	Vikas

<b>Reference Books</b>			
<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
1	Research Methodology	Panneerselvam R	PHI

  
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**Course Details:**

<b>Class</b>	M: Tech, Sem.-II
<b>Course Code and Course Title</b>	0EEPS553, Power System Lab-II
<b>Prerequisite/s</b>	---
<b>Teaching Scheme:</b> Lecture/Tutorial/Practical	0/0/2
<b>Credits</b>	01
<b>Evaluation Scheme: ISE / ESE</b>	50/50

**Course Educational Objectives(CEOs):**

The course aims to:

01	To demonstrate and design modeling of converters
02	To study and analyze HVDC converter Characteristic
03	To analyze the Modeling & Simulation of Three Phase Harmonic Filters
04	To Design simulation models for circuit breakers, surge arrestors, Filter

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS553_1	Design Simulation Model of converter using MATLAB (Level 6)
0EEPS553_2	Design simulation model of HVDC system using MATLAB (Level 6)
0EEPS553_3	Analyze the Harmonic and transient performance of HVDC transmission system (Level 4)
0EEPS553_4	Analyze and Design the simulation model of Circuit Breaker and surge arresters for HVDC System (Level 4 & 6)
0EEPS553_5	Design and analyze simulation model of free switching Binary Current generation of TBSC & TBSR(Level 6)

**List of Experiments:**

Sr. No	Title of Experiments
1.	To analyze ideal switch of inductor current chopping
2.	Design transient free switching of capacitor
3.	Design transient free switching of inductor
4.	Design and Analyze Binary Current Generation of TBSC & TBSR
5.	Modeling & Simulation of Two Identical Single-Phase Rectifiers.
6.	Modeling & Simulation of Three-phase diode rectifier.
7.	Design Simulation model of 3 phase SPWM and ISPWM Inverter.
8.	Design Simulation of 6 and 12 pulse 3 phase HVDC system.
9.	Steady-state and transient performance of a 12-pulse, 1000 MW (500 kV-2kA) 50/60 Hz HVDC transmission system.
10.	Study and Simulation of Circuit Breaker and surge arresters.
11.	Analyze VSC-Based HVDC Transmission Link.
12.	Modeling & Simulation of Three-Phase Harmonic Filters used on a 12-pulse AC/DC Converter

  
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13.	Harmonic analysis on sinusoidal waveform and working of sinusoidal PWM inverter.
14.	Study and simulation of 6 pulse HVDC system & observe Vd-Id characteristics.
15.	Hardware Design using Arduino

  
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**Course Details:**

<b>Class</b>	M. Tech, Sem.-II
<b>Course Code and Course Title</b>	0EEPS554, <b>High Voltage Engineering</b>
<b>Prerequisite/s</b>	---
<b>Teaching Scheme:</b>	
<b>Lecture/Tutorial/Practical</b>	0/0/2
<b>Credits</b>	1
<b>Evaluation Scheme: ISE/ESE</b>	50/00

**Course Educational Objectives(CEOs):**

The course aims to:

01	Get familiar with measurement of insulation of dielectric materials
02	Understand construction and working of impulse generator
03	Understand field mapping using electrolyte tank
04	Measure capacitance of cables

**Course Outcomes (COs):**

Upon successful completion of this course, the student will be able to:

0EEPS554_1	Demonstrate electrical breakdown voltage of transformer oil (Cognitive Level 3)
0EEPS554_2	Illustrate generation and measurement of high voltage and current (Cognitive Level 3)
0EEPS554_3	Analyze insulation strength of any dielectric material, Cables (Cognitive Level 4)
0EEPS554_4	Demonstrate field mapping using Electrolyte Tank (Cognitive Level 3)
0EEPS554_5	Calculate Capacitance of cables (Cognitive Level 3)

**List of Experiments:**

Minimum 8 Experiments to be performed

Sr. No	Title of Experiments
1	To determine breakdown voltage of transformer oil
2	To study 5 KV AC Insulation Test
3	To study 5 stage 150 KV and 225J impulse generator and to measure wave shape (front time, tail time and peak voltage) of impulse wave
4	Measurement of breakdown voltage (for AC and DC) of air, using sphere gap assembly
5	Field mapping using electrolyte tank
6	Capacitance Measurement of Cables
7	Measurement of Dielectric properties with Schering Bridge
8	Partial Discharge Measurements of Transformer windings and Cables
9	Insulation Testing of Cables, wires
10	Application of High Voltage in Domestic level- Demonstration of working of

  
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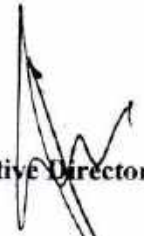
  
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	Mosquito Rackets, Electric gas Lighters, High Voltage Stun gun, microwave ovens. Electronic Pulse igniter, CRT devices.
11	A report on visit to high voltage laboratory

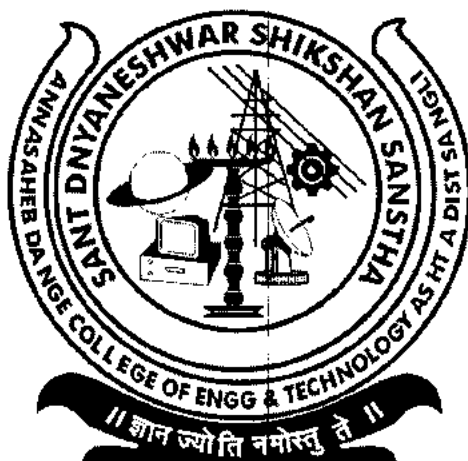
  
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## **Structure**

**T. Y. B. Tech.  
AUTOMOBILE ENGINEERING**

**SEM V & SEM VI**

**(W. e. f. Academic Year 2021-2022)**

**Department of Automobile Engineering**

**Teaching and Evaluation Scheme**  
**B. Tech: Semester V (Automobile Engineering)**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1AUOE301, 1AUOE302	Open Elective -I	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUPC303	Dynamics of Machines	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUPC304	Heat Transfer	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUPC305	Design of Machine Elements	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUPE30*	Professional Elective-I	04	--	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUMC309	Entrepreneurship and business start-up	02	--	--	--	ISE	50	20	Grade	--
1AUPC351	Dynamics of Machines Laboratory	--	--	02	01	ISE	--	--	25	10
1AUPC352	Heat Transfer Laboratory	--	--	02	01	ESE	--	--	POE	50
1AUPR353	Mini project	--	--	02	01	ISE	--	--	25	10
1AUPC354	Computational Fluid Dynamics Laboratory-I	--	--	02	01	ESE	---	---	POE	50
1AUPC355	Simulation & Analysis Software Laboratory-I	--	--	02	01	ISE	---	---	25	10
<b>Total</b>		<b>18</b>	<b>--</b>	<b>10</b>	<b>21</b>	<b>Total</b>	<b>550</b>	<b>---</b>	<b>225</b>	<b>--</b>
<b>Total Contact Hours/Week= 28 hrs</b>										

*Course Code	Professional Elective-I
1AUPE306	Automotive System Design
1AUPE307	Machine tool engineering
1AUPE308	Two wheeler and three wheeler technology

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**Department of Automobile Engineering**

**Open Elective -I**

Courses Code	Course Name	Department
1AEOE311	Introduction to Flight	Aeronautical Engineering
1AEOE312	Introduction to Experimental Aerodynamics	
1AEOE313	Introduction to Gas Dynamics and Jet Propulsion	
1AEOE314	Introduction to Unmanned Aerial Vehicles	
1AUOE301	Product Design and Development	Automobile Engineering
1AUOE302	Automotive Refrigeration and Air Conditioning	
1CVOE301	Air Pollution & Control	Civil Engineering
1CVOE302	Remote Sensing & GIS Applications	
1CSOE301	Database Essentials and Business Intelligence	Computer Science and Engineering
1CSOE302	Software Engineering and Project Management	
1CSOE303	Data Structures and Algorithms	
1EEOE301	Electrical Technology	Electrical Engineering
1EEOE302	Electrical and Electronics Measurements	
0FTOE311	Packaging Technology	Food Engineering
1MEOE301	Industrial Automation and Robotics	Mechanical Engineering
1MEOE302	Composite Materials	
1MEOE303	Solar Technology	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	--	--	--	13	04	03	01
Cumulative Sum	6	20	23	46	04	03	03

  
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**Teaching and Evaluation Scheme**  
**B. Tech: Semester VI (Automobile Engineering)**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1AUOE310, 1AUOE311	Open Elective -II	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUPC312	Internal Combustion Engines and Emissions	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUPC313	Vehicle Dynamics	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUHS314	Industrial Management and Operations Research	04	--	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUPE31*	Professional Elective-II	04	--	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1AUMC318	Constitution of India	02	--	--	--	ISE	50	20	Grade	--
1AUPC356	Engine Testing Laboratory	--	--	02	01	ESE	--	--	POE	50
1AUPC357	Vehicle Diagnosis & Maintenance Laboratory	--	--	02	01	ESE	--	--	POE	50
1AUPC358	Computational Fluid Dynamics Laboratory-II	--	--	04	02	ISE	--	--	--	50
1AUPR359	Internship-II	--	--	--	02	ISE	--	--	--	25
<b>Total</b>		<b>19</b>	<b>00</b>	<b>08</b>	<b>23</b>	<b>Total</b>	<b>550</b>	<b>--</b>	<b>--</b>	<b>175</b>
<b>Total Contact Hours/Week= 27hrs</b>										

*Course Code	Professional Elective-II
1AUPE315	Design optimization
1AUPE316	Metal heat treatments and testing.
1AUPE317	Special Purpose Vehicle

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**Open Elective –II**

Courses Code	Course Name	Department
1AEOE321	Lighter Than Air Systems	Aeronautical Engineering
1AEOE322	Airline and Airport Management	
1AEOE323	Flight Scheduling and Operations	
1AUOE310	Vibration based fault diagnosis	Automobile Engineering
1AUOE311	Engineering Tribology	
1CVOE310	Operation Research	Civil Engineering
1CVOE311	Economics And Management	
1CSOE311	Internet of Things	Computer Science and Engineering
1CSOE312	Cyber Laws and Ethical Hacking	
1EEOE306	Electrical Wiring Harnessing	Electrical Engineering
1EEOE307	Electrical Economics & Energy Audit	
0FTOE321	Process Modeling and Simulation	Food Engineering
1MEOE304	Industrial Management and Operation Research	Mechanical Engineering
1MEOE305	Non-Destructive Testing	
1MEOE306	Computational Fluid Dynamics	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	04	--	--	10	04	03	02
Cumulative Sum	10	20	23	56	08	06	05

  
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**Teaching and Evaluation Scheme**  
**B. Tech: Semester VII (Automobile Engineering)**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1AUOE401, 1AUOE402	Open Elective-III	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1AUPC403	Vehicle Performance	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1AUPE40*	Professional Elective-III	03	01	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1AUPC407	Finite Element Method	03	--	-	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1AUPC408	Engine Design	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1AUMC409	Project Finance and Management	02	--	--	--	ISE	50	20	Grade	--
1AUPC451	Vehicle Performance Laboratory	--	--	02	01	ISE	--	--	POE	50
1AUPC452	Automotive Electronics Laboratory	--	--	02	01	ISE	--	--	---	25
1AUPC453	Simulation & Analysis Software Laboratory-I I	--	--	02	01	ISE	--	--	---	25
1AUPR454	Project Phase-I	--	--	06	04	ESE	--	--	POE	50
						ISE	--	--	--	50
<b>Total</b>		<b>17</b>	<b>01</b>	<b>12</b>	<b>23</b>	<b>Total</b>	<b>550</b>	--	<b>200</b>	--
<b>Total Contact Hours/Week= 30 hrs</b>										

*Course Code	Professional Elective-III
1AUPE404	Automotive Noise and Vibration
1AUPE405	CNC and Programming
1AUPE406	Alternative Fuels and Hybrid Vehicle

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**Open Elective-III**

Courses Code	Course Name	Department
1AEOE421	Air Traffic Control and Airport Management	Aeronautical Engineering
1AEOE422	Aircraft General Engineering Maintenance	
1AEOE423	Design of Fixed wing unmanned aerial vehicles	
1AUOE401	Vehicle maintenance and safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1CSOE401	Computer Vision	Computer Science and Engineering
1CSOE402	Machine Learning	
1CSOE401	Computer Vision	
1EEOE401	Electric Vehicles	Electrical Engineering
1EEOE402	Wind and Solar Energy Systems	
0FTOE411	Process Optimization and Automation	Food Engineering
0FTOE412	Cold Storage and Supply Chain Management	
1MEOE401	Total Quality Management	Mechanical Engineering
1MEOE402	Reliability engineering	
1MEOE403	Renewable Energy Engineering	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	--	--	--	12	04	03	04
Cumulative Sum	10	20	23	68	12	09	09

  
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**Teaching and Evaluation Scheme**  
**B. Tech: Semester VIII (Automobile Engineering)**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1AUPC410	Vehicle Aerodynamics	2	-	-	02	ESE	100	40	--	--
1AUPC411	Automotive Fault Diagnosis	3	-	-	03	ESE	100	40	--	--
1AUPR455	Project phase –II	--	--	--	08	ISE	--	--	100	40
						ESE	--		100	40
1AUPR456	Internship-III / Inter or intra institutional activities	--	--	--	02	ISE	--	--	100	40
						ESE	--		100	40
Total		05	--	--	15	Total	200	--	400	--

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	--	--	--	05	--	--	10
Cumulative Sum	10	20	23	73	12	09	19

**Semester wise credit distribution**

	AICTE	Institute
F.Y.B.Tech, Sem-I	17.5	19
F.Y.B.Tech, Sem-II	20.5	22
S.Y.B.Tech, Sem-III	23	20
S.Y.B.Tech, Sem-IV	19	23
T.Y.B.Tech, Sem-V	20.5	21
T.Y.B.Tech, Sem-VI	21.5	23
B.Tech, Sem-VII	18.5	23
B.Tech, Sem-VIII	18	15
<b>Total</b>	<b>158.5</b>	<b>166</b>

	HS	BS	ES	PC	PE	OE	PR	Total
As per AICTE	12	25	24	48	18	18	15	160
Institute	10	20	23	73	12	09	19	166

**HS: Humanities and Social Sciences including Management courses**

**BS: Basic Science**

**ES: Engineering Science**

**PC: Professional Core courses**

**PE: Professional Elective**

**OE: Open Elective**

**Project/Internship**

**Inclusion of Mandatory Courses and Audit Courses without credit**

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**S.Y.B. Tech: Semester III**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0AUBS201	Applied Mathematics –III	03	01	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC202	Applied Thermodynamics	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC203	Fluid Mechanics and Machinery	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC204	Automotive Materials and Heat Treatments	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC205	Elements of Automotive Engineering	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC251	Applied Thermodynamic Laboratory	--	--	02	01	ISE	--	--	25	10
0AUPC252	Fluid Mechanics Laboratory	--	--	02	01	ESE	--	POE	25	10
0AUPC253	Metallurgy Laboratory	--	--	02	01	ISE	--	--	25	10
0AUPC254	Automotive Component Drawing Laboratory	--	--	02	01	ISE	--	--	50	20
0AUPC255	Workshop Practice-II Laboratory	--	--	02	01	ISE	--	--	25	10
0AUES256	Electrical Technology Laboratory	--	--	02	01	ISE	--	--	25	10
0AUHS257	Communication Skills	--	--	02	01*	ISE	--	--	50	20
Total		15	01	14	23	Total	500	--	300	--
Total Contact Hours/Week= 30 Hrs						Total Marks= 800				

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	1	4	1	17	--	--	--	--
Cumulative Sum	1	4	1	17	--	--	--	--

  
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**S.Y.B. Tech: Semester IV**

Course Code	Course	Teaching Scheme				Scheme	Evaluation Scheme			
		L	T	P	Credits		Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0AUPC206	Automotive Chassis	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC207	Theory of Machines	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC208	Manufacturing Engineering	04	--	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC209	Strength of Materials	03	--	--	03 *	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC210	Transport Management	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUMC211	Environmental Studies	02	--	--	--	ESE	50	20	--	--
0AUPC258	Automotive Engineering Laboratory	--	--	02	01	ISE	--	--	25	10
						ESE	--	POE	25	10
0AUPC259	Theory of Machines Laboratory	--	--	02*	01	ISE	--	--	25	10
0AUPC260	Strength of Materials Tutorial	--	01	--	01	ISE	--	--	25	10
0AUPC261	Instrumentation & Measurement Laboratory	--	--	02	01	ISE	--	--	25	10
						ESE	--	POE	25	10
0AUPC262	Hydraulics & Pneumatics Laboratory	--	--	02	01	ISE	--	--	50	20
0AUBS263	Programming In C++	--	--	02*	01	ISE	--	--	25	10
0AUHS264	Professional Skills Development – I	--	--	02	01	ISE	--	--	25	10
Total		18	01	10	23	Total	550	--	250	--
Total Contact Hours/Week= 29 hrs						Total Marks=800				
*Indicates lab session to be conducted every alternative week										

\*Indicates lab session to be conducted every alternative week

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	1	1	--	21	--	--	--	--
Cumulative Sum	2	5	1	38	--	--	--	--

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**Teaching and Evaluation Scheme**  
**B. Tech: V Semester**

B. Tech: V Semester										
Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing		Max
0AUPC301	Dynamics of Machines	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC302	Heat Transfer	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC303	Design of Machine Elements	03	01	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC304	Automotive Transmission	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC305	Vehicle Body Engineering	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC351	Dynamics of Machines Laboratory	--	--	02	01	ISE	--	--	25	10
0AUPC352	Heat Transfer Laboratory	--	--	02	01	ESE	--	POE	25	10
0AUPC353	CAD – Modeling Laboratory	--	--	02	01	ISE	---	---	50	20
0AUPC354	Vehicle Body and Maintenance Laboratory	--	--	02	01	ISE	---	---	50	20
0AUPC355	Seminar	--	--	02	01	ISE	---	---	25	10
0AUHS356	Professional Skills Development – II	--	02	--	02	ISE	---	---	25	10
0AUAC357	Entrepreneurship and Business Startup	02	--	--	--	ISE	50	20	Grade	--
Total		17	03	10	23					
Total Contact Hours/Week= 30 hrs										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	2	--	--	21	--	--	--	--
Cumulative Sum	7	21	30	59	--	--	--	--

  
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**Department of Automobile Engineering**

**Teaching and Evaluation Scheme**

**B. Tech: VI Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0AUPC314	Internal Combustion Engines and Emissions	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC315	Alternative Fuels and Hybrid Vehicle	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC316	Industrial Management and Operations Research	03	01	--	04	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC317	Advanced Automotive Technology	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPE3**	Program Elective-I	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC358	Engine Testing Laboratory	--	--	02	01	ISE	--	--	50	20
0AUPC359	Emission Laboratory	--	--	02	01	ESE	--	POE	50	20
0AUPC360	Vehicle Diagnosis & Maintenance Laboratory	--	--	04	02	ISE	--	--	50	20
0AUPC361	Computational Fluid Dynamics Laboratory-I	--	--	04	02	ISE	--	--	50	20
0AUPC362	Mini Project	--	--	02	01	ESE	--	POE	25	10
0AUPC455#	Field Training#	--	--	--	--	ISE	--	--	50	20
		--	--	--	--	--	--	--	--	--
<b>Total</b>		<b>15</b>	<b>01</b>	<b>14</b>	<b>23</b>	<b>Total</b>	<b>500</b>	<b>--</b>	<b>300</b>	<b>--</b>

Total Contact Hours/Week= 30 hrs

Total Marks=800

#Field training to be performed after VI Semester during vacation and evaluation to be carried in VII semester.

**\*Program Elective-I**

*Course Code	Course	Course Code	Course
0AUPE318	Automotive Refrigeration and Air-conditioning	0AUPE320	Tyre Technology
0AUPE319	Vehicle Aesthetics and Ergonomics	0AUPE321	Automotive Safety

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	--	--	--	20	3	--	--	--
Cumulative Sum	7	21	30	79	3	--	--	--

  
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### Teaching and Evaluation Scheme

#### B. Tech: VII Semester

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0AUPC401	Engine Design	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC402	Finite Element Method	03	--	-	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC403	Vehicle Dynamics	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPE404	Program Elective-II	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUOE408	Open Elective	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUAC409	Intellectual Property Rights	02	--	--	--	ISE	100	40	--	--
0AUPC451	Engine Design Laboratory	--	--	02	01	ISE	--	--	25	10
0AUPC452	Simulation & Analysis Software Laboratory-I	--	--	04	02	ESE	--	POE	25	10
						ISE	--	--	25	10
0AUPC453	Computational Fluid Dynamics Laboratory-II	--	01	02	02	ESE	--	POE	25	10
0AUPC454	Project Phase-I	--	--	04	04	ISE	--	--	50	20
0AUPC455	Field Training *	--	--	--	02	ISE	--	--	25	10
Total		17	01	12	26	Total	600	--	200	--
Total Contact Hours/Week= 30 hrs						Total Marks=800				

\*Field training to be performed after VI Semester during vacation and evaluation to be carried in VII semester

Program Elective-II				Open Elective	
Course Code	Course	Course Code	Course	Course Code	Course
0AUPE404	Vehicle Aerodynamics	0AUPE406	Computational Fluid Dynamics	0AUOE408	Vehicles
0AUPE405	Tribology	0AUPE407	Combustion Engineering	--	--

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	--	--	--	20	3	3	--	--
Cumulative Sum	7	21	30	99	6	3	--	--

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**Department of Automobile Engineering**

**Teaching and Evaluation Scheme**  
**B. Tech: VIII Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0AUPC410	Automotive System Design	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC411	Vehicle Performance & Testing	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC412	Automotive Noise and Vibration	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPE413	Program Elective – III	03	--	--	03	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AUPC417	Automotive Electronics	02	--	--	02	ISE I	--	20	--	--
						MSE	--		--	--
						ISE II	--		--	--
						ESE	50		--	--
0AUPC456	Automotive System Design Laboratory	--	--	02	01	ISE	--	---	25	10
0AUPC457	Vehicle Performance Laboratory	--	--	02	01	ESE	--	POE	25	10
0AUPC458	Automotive Electronics Laboratory	--	--	02	01	ISE	--	---	25	10
0AUPC459	Simulation & Analysis Software Laboratory-II	--	--	02	01	ISE	--	--	50	20
0AUPC460	Project Phase – II	--	--	08	08	ISE	--	--	100	40
						ESE	--	POE	100	40
<b>Total</b>		<b>14</b>	<b>--</b>	<b>16</b>	<b>26</b>	<b>Total</b>	<b>450</b>	<b>--</b>	<b>350</b>	<b>--</b>
<b>Total Contact Hours/Week= 30 hrs</b>						<b>Total Marks=800</b>				

Program Elective-III			
Course Code	Course	Course Code	Course
0AUPE413	Robotics and Automation	0AUPE415	Special Purpose Vehicle
0AUPE414	Advanced Automotive Materials	0AUPE416	Fuel Cell Technology

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	--	--	--	23	3	--	--	--
Cumulative Sum	7	21	30	122	9	3	--	--

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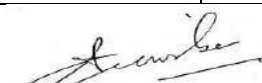


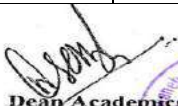
**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: III Semester**


Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVBS201	Applied Mathematics III	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC202	Surveying	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC203	Fluid Mechanics	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC204	Strength of Materials	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC205	Building Construction & Materials	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC251	Surveying Laboratory	--	--	2	1	ISE	---	---	50	20
						ESE	---	POE	25	10
0CVPC252	Fluid Mechanics Laboratory	--	--	2	1	ISE	---	---	50	20
						ESE	---	POE	25	10
0CVPC253	Strength of Materials Laboratory	--	--	2	1	ISE	---	---	50	20
						ESE	---	OE	25	10
0CVPC254	C Programming Laboratory	--	--	2	1	ISE	---	---	25	10
0CVPC255	Building Construction & Materials Laboratory	--	--	2	1	ISE	---	---	50	20
0CVAC256	Introduction to Psychology	2	--	--	--	ISE	--	Grade	--	--
<b>Total</b>		<b>19</b>	<b>01</b>	<b>10</b>	<b>23</b>	--	<b>500</b>	<b>--</b>	<b>300</b>	<b>--</b>
<b>Total Contact Hours/Week: 30 hrs</b>						<b>Total-500+300=800</b>				


\* Grade will be assigned based on internal assessment.

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	04	00	19	00	00	00
Cumulative Sum	03	20	29	19	00	00	00

  
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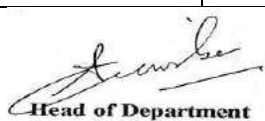



  
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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: IV Semester**

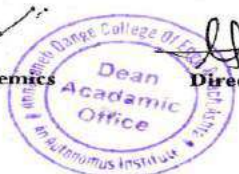
Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVPC206	Engineering Management	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVES207	Structural Analysis	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC208	Advanced Surveying	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC209	Building Design& Drawing	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC210	Concrete Technology	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVMC211	Environmental Studies	2	--	--	--	ISE	--	Grade	--	--
0CVHS257	General Proficiency Laboratory	--	--	2	1	ISE	---	---	25	10
0CVPC258	Advanced Surveying Laboratory	--	--	2	1	ISE	---	---	50	20
0CVPC259	Building Design & Drawing Laboratory	--	--	4	2	ISE	---	---	50	20
0CVPC260	Concrete Technology Laboratory	--	--	2	1	ESE	---	POE	50	20
0CVPC261	CAD Practice Laboratory	--	--	2	1	ISE	---	OE	25	10
						ISE	---	---	50	20
<b>Total</b>		<b>17</b>	<b>1</b>	<b>12</b>	<b>22</b>	<b>--</b>	<b>500</b>	<b>--</b>	<b>300</b>	<b>--</b>
<b>Total Contact Hours/Week: 30 hrs</b>						<b>Total-500+300=800</b>				

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	00	04	17	00	00	00
Cumulative Sum	04	20	33	36	00	00	00

  
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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: V Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVPC301	Design of Steel Structures	3	1	--	4	ISE I	10	40	--	--
						MSE	30		---	---
						ISE II	10		--	--
						ESE	50		--	--
0CVPC302	Soil Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC303	Water Supply Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVES304	Engineering Geology	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC305	Infrastructure Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC351	Soil Mechanics Laboratory	--	--	2	1	ISE	---	---	50	20
0CVPC352	Water Supply Engineering Laboratory	--	--	2	1	ESE	---	POE	25	10
0CVES353	Engineering Geology Laboratory	--	--	2	1	ISE	---	---	25	10
0CVPC354	Infrastructure Engineering Laboratory	--	--	2	1	ISE	---	---	50	20
0CVPC355	Building Planning & Drawing Laboratory	--	1	4	3	ESE	---	OE	25	10
0CVAC306	Professional Lectures and Skill Practices	1	--	2	--	ISE	---	---	50	20
Total		16	02	14	23	ESE	---	POE	50	20
Total Contact Hours/Week: 32 hrs						--	--	ISE* (Grade)	--	--
						--	500	--	300	--
						Total-500+300=800				

\* Grade will be assigned based on internal assessment.

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	04	19	00	00	00
Cumulative Sum	04	20	37	55	00	00	00

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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: VI Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVPC307	Theory of Structures	3	1	--	4	ISE I	10	40	--	--
						MSE	30		---	---
						ISE II	10		--	--
						ESE	50		--	--
0CVPC308	Foundation Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC309	Waste Treatment & Pollution Control	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC310	Water Resources Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPE3**	Program Elective I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC357	Waste Treatment & Pollution Control Laboratory	-	--	2	1	ISE	---	---	50	20
						ESE	---	OE	25	10
0CVPE3**	Program Elective I Laboratory	-	--	2	1	ISE	---	---	50	20
						ESE	---	OE	25	10
0CVPR358	Mini Project I (SDD I)	-	--	4	2	ISE	---	---	50	20
0CVPC359	Self Study	--	--	2	1	ISE	---	---	50	20
0CVES360	Soft Computing Skills in Civil Engineering - I	--	--	4	2	ISE	--	--	50	20
Total		15	1	14	23	--	500	--	300	--
Total Contact Hours/Week: 30 hrs						Total-500+300=800				

Note: Students have to undergo Industrial Training/Internship for 21 days and present the work in next semester.

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	02	15	04	00	02
Cumulative Sum	04	20	39	70	04	00	02

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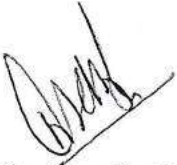
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Sr. No.	Course Code	Program Elective I	Sr. No.	Laboratory Course Code	Program Elective I Laboratory
1	0CVPE311	Open Channel Flow	1	0CVPE361	Open Channel Flow Laboratory
2	0CVPE312	Pavement Design & Analysis	2	0CVPE362	Pavement Design & Analysis Laboratory
3	0CVPE313	Remote Sensing & GIS Applications in Civil Engineering	3	0CVPE363	Remote Sensing & GIS Applications in Civil Engineering Laboratory
4	0CVPE314	Design of Concrete Bridges	4	0CVPE364	Design of Concrete Bridges Laboratory
5	0CVPE315	Advanced Foundation Engineering	5	0CVPE365	Advanced Foundation Engineering Laboratory
6	0CVPE316	Town Planning & Transportation Engineering	6	0CVPE366	Town Planning & Transportation Engineering Laboratory
7	0CVPE317	Solid Waste Management	7	0CVPE367	Solid Waste Management Laboratory

  
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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: VII Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVPC401	Estimating & Costing	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC402	Design of Concrete Structures I	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC403	Earthquake Resistant Structures	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPE4**	Program Elective II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVOE4**	Open Elective	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC451	Estimating & Costing Laboratory	--	--	2	1	ISE	--	--	50	20
						ESE	--	OE	25	10
0CVHS452	General Proficiency Laboratory II	--	--	2	1	ISE*	--	--	50	20
0CVES453	Soft Computing Skills in Civil Engineering- II	--	--	2	1	ISE	--	--	25	10
0CVPR455	Project Phase – I	--	--	6	6	ISE	--	--	100	40
						ESE	--	OE	50	20
Total		16	01	12	26	--	500	--	300	--
Total Contact Hours/Week: 29 hrs						Total-500+300=800				

\* Industrial Training Presentation will be included as a part of the course and assessed.

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	00	01	12	03	03	06
Cumulative Sum	05	20	40	82	07	03	08

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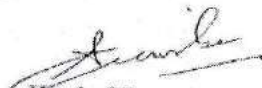
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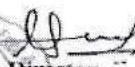
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Program Elective II		Course Code
Sr. No.	Course Name	
1	Advanced Structural Analysis	0CVPE404
2	Repairs & Rehabilitation of Structures	0CVPE405
3	Advanced Construction Techniques	0CVPE406
4	Legal Aspects in Civil Engineering	0CVPE407
5	Ground Improvement Techniques	0CVPE408
6	Hydraulic Structures	0CVPE409
7	Green building	0CVPE410

Open Elective		Course Code
Sr. No.	Course Name	
1	Operations Research	0CVOE411
2	Human Resources Development	0CVOE412
3	Air Pollution & Control	0CVOE413
4	Research Methodology	0CVOE414
5	Economics & Management	0CVOE415
6	Finite Element Method	0CVOE416
7	Disaster Management	0CVOE417

  
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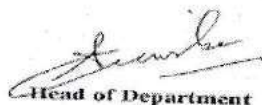


  
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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: VIII Semester**


Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVPC421	Design of Concrete Structures II	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC422	Project Management	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC423	Entrepreneurship	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPE4**	Program Elective III	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CVPC457	Entrepreneurship Laboratory	--	--	2	1	ISE	--	--	50	20
0CVPE4**	Program Elective III Laboratory	--	--	2	1	ISE	--	--	50	20
0CVPC458	Mini Project II (SDD II)	--	--	4	2	ISE	--	--	50	20
						ESE	--	OE	50	20
0CVPR459	Project Phase II	--	--	6	10	ISE	--	---	100	40
						ESE	--	OE	100	40
0CVAC460	Stress Management	1	--	--	--	--	--	ISE* (Grade)	--	--
<b>Total</b>		<b>13</b>	<b>01</b>	<b>14</b>	<b>27</b>	--	<b>400</b>	<b>--</b>	<b>400</b>	<b>--</b>
<b>Total Contact Hours/Week: 28 hrs</b>						<b>Total-400+400=800</b>				

\* Grade will be assigned based on internal assessment.

  
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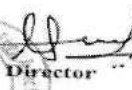
  
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Sr. No.	Program Elective III	Course Code	Sr. No.	Program Elective III Laboratory Name	Laboratory Course Code
1	Management Information Systems	0CVPE424	1	Management Information Systems	0CVPE461
2	Structural Dynamics	0CVPE425	2	Structural Dynamics	0CVPE462
3	Site Investigations Methods & Practices	0CVPE426	3	Site Investigations Methods and Practices	0CVPE463
4	Advanced Engineering Geology and Rock Mechanics	0CVPE427	4	Advanced Engineering Geology and Rock Mechanics	0CVPE464
5	Structural Audit	0CVPE428	5	Structural Audit	0CVPE465
6	Environmental Impact Assessment	0CVPE429	6	Environmental Impact Assessment	0CVPE466
7	Safety Aspect in Construction	0CVPE430	7	Safety Aspect in Construction	0CVPE467
8	Industrial Waste Water Treatment	0CVPE431	8	Industrial Waste Water Treatment	0CVPE468

  
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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: III Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1CVBS201	Applied Mathematics III	3	1	--	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC202	Advanced Surveying	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC203	Fluid Mechanics	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC204	Strength of Materials	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVPC205	Building Technology	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50	20	--	--	
1CVES251	CAD Practice Laboratory	--	--	2	1	ISE	--	--	25	10	
1CVPC252	Advanced Surveying Laboratory	--	--	2	1	ISE	--	--	25	10	
1CVPC253	Strength of Materials Laboratory	--	--	2	1	ESE	--	--	POE	25	10
1CVPC254	Fluid Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10	
1CVPC255	Building Technology Laboratory	--	--	2	1	ESE	--	--	POE	25	10
<b>Total</b>		<b>15</b>	<b>1</b>	<b>10</b>	<b>21</b>	ISE	--	--	50	20	
<b>Total Contact Hours/Week: 26 hrs</b>						--	<b>500</b>	--	<b>200</b>	--	
						<b>Total-500+200=700</b>					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	04	01	16	00	00	00
Cumulative Sum	04	20	21	16	00	00	00

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CV-ST-05/15



**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: IV Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
ICVHS206	Engineering Management	4	--	-	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
ICVPC207	Structural Analysis	3	--	-	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
ICVPC208	Water Resources Engineering	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
ICVPC209	Building Design & Drawing	3	--	-	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
ICVPC210	Concrete Technology	3	--	-	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
ICVMC211	Environmental Studies	2	--	-	--	ISE	Grade	--	--	--	--
ICVHS212	Introduction to Psychology	1	--	-	1	ISE	--	--	25	10	
ICVPC256	Building Design & Drawing Laboratory	--	--	4	2	ISE	--	--	50	20	
ICVPC257	Concrete Technology Laboratory	--	--	2	1	ESE	--	--	POE	25	10
ICVHS258	General Proficiency I Laboratory	--	--	2	1	ISE	--	--	50	20	
						ESE	--	--	OE	25	10
						ISE	--	--	25	10	
<b>Total</b>		<b>19</b>	<b>--</b>	<b>08</b>	<b>21</b>		<b>500</b>	<b>--</b>	<b>200</b>	<b>---</b>	
<b>Total Contact Hours/Week: 27 hrs</b>						<b>Total-500+200=700</b>					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	06	00	00	15	00	00	00
Cumulative Sum	10	20	21	31	00	00	00

  
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CV-57-06/15

**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: V Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
I##OE###	Open Elective I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPC303	Design of Steel Structures	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPC304	Geotechnical Engineering I	4	--	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPC305	Environmental Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPE3**	Professional Elective I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
ICVPC351	Geotechnical Engineering I Laboratory	--	--	2	1	ISE	--	--	25	10
ICVPC352	Building Planning & Drawing Laboratory	--	--	4	2	ESE	--	--	POE	25
ICVPE3**	Professional Elective I Laboratory	--	--	2	1	ISE	--	--	OE	25
ICVPC358	Environmental Engineering Laboratory	--	--	2	1	ISE	--	--	--	25
ICVES359	Professional Skill Practices	--	--	2	1	ISE	--	--	--	25
ICVPR360	Seminar	--	1	--	1	ISE	--	--	--	25
<b>Total</b>		<b>16</b>	<b>2</b>	<b>12</b>	<b>24</b>	--	<b>500</b>	--	<b>200</b>	--
<b>Total Contact Hours/Week: 30 hrs</b>						<b>Total-500+200=700</b>				

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	01	15	04	03	01
Cumulative Sum	10	20	22	46	04	03	01

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CV-5T-08/15



Sr. No.	Course Code	Professional Elective I	Sr. No.	Laboratory Course Code	Professional Elective I Laboratory
1	1CVPE306	Engineering Geology	1	1CVPE353	Engineering Geology Laboratory
2	1CVPE307	Advanced Structural Analysis	2	1CVPE354	Advanced Structural Analysis Laboratory
3	1CVPE308	Open Channel Flow	3	1CVPE355	Open Channel Flow Laboratory
4	1CVPE309	Town Planning & Traffic Engineering	4	1CVPE356	Town Planning & Traffic Engineering Laboratory
5	1CVPE310	Safety Aspects in Construction	5	1CVPE357	Safety Aspects in Construction Laboratory

Open Elective I		
Course Code	Course Name	Course Offered by
IME0E101	M/CS and Mechanisms	Mechanical Engineering
IME0E102	Manufacturing Engineering	
1CSOE301	Database Essentials	Computer Science and Engineering
1CSOE302	Software Engineering and Project Management	
1CSOE303	Data Structures and Algorithms	
IEEOE301	Electrical Technology	Electrical Engineering
IEEOE302	Electrical and Electronics Measurements	
1CVOE301	Air Pollution & Control	Civil Engineering
1CVOE302	Remote Sensing & GIS Applications	
1AUOE301	Product design and development	Automobile Engineering
1AUOE302	Automotive Refrigeration and air conditioning	
1AEOE101	Introduction to Aerospace Engineering	Aeronautical Engineering
1AEOE102	Drone Piloting	

  
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CV-5T-09/15

**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: VI Semester**

Course Code	Course	Teaching Scheme			
		L	T	P	Credits
UE##	Open Elective II	3	--	--	3
ICVPC312	Theory of Structures	3	1	--	4
ICVPC313	Infrastructure Engineering	3	--	--	3
ICVPE3**	Professional Elective II	3	--	--	3
ICVPE3**	Professional Elective III	3	--	--	3
ICVMC324	Constitution of India	2	--	--	--
ICVPC361	Infrastructure Engineering Laboratory	--	--	2	1
ICVPE3**	Professional Elective III Laboratory	--	--	2	1
ICVPR367	Structural Design & Drawing I	--	--	4	2
ICVES368	Software Training in Civil Engineering	--	--	4	2
Total		17	1	12	22
Total Contact Hours/Week: 30 hrs					

Scheme	Evaluation Scheme				
	Theory (Marks)		Practical (Marks)		
	Max	Min. for Passing	Max	Min. for Passing	
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50		20	--	--
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50		20	--	--
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50		20	--	--
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50		20	--	--
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50		20	--	--
ISE	--	--	Grade	--	--
ISE	--	--	--	25	10
ESE	--	--	OE	25	10
ISE	--	--	--	25	10
ISE	--	--	--	50	20
ESE	--	--	OE	25	10
ISE	--	--	--	50	20
--	500	--	--	200	--
Total-500+200=700					

\*Students should undergo one month field training in vacation (15 May to 15 June) which will be assessed in the next semester

<b>Course Category</b>	<b>IIS</b>	<b>BS</b>	<b>ES</b>	<b>PC</b>	<b>PE</b>	<b>OE</b>	<b>PR</b>
<b>Credits</b>	<b>00</b>	<b>00</b>	<b>02</b>	<b>08</b>	<b>07</b>	<b>03</b>	<b>02</b>
<b>Cumulative Sum</b>	<b>10</b>	<b>20</b>	<b>24</b>	<b>54</b>	<b>11</b>	<b>06</b>	<b>03</b>

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Sr. No.	Course Code	Professional Elective II
1	1CVPE314	Repair & Rehabilitation of Structures
2	1CVPE315	Solid Mechanics
3	1CVPE316	Disaster Management
4	1CVPE317	Ground Improvement Techniques
5	1CVPE318	Geotechnical Engineering II

Sr. No.	Course Code	Professional Elective III	Sr. No.	Course Code	Professional Elective III Laboratory
1	1CVPE319	Site Investigation Methods & Practices	1	1CVPE362	Site Investigation Methods & Practices Laboratory
2	1CVPE320	Structural Masonry	2	1CVPE363	Structural Masonry Laboratory
3	1CVPE321	Waste Treatment & Pollution Control	3	1CVPE364	Waste Treatment & Pollution Control Laboratory
4	1CVPE322	Advanced Construction Techniques	4	1CVPE365	Advanced Construction Techniques Laboratory
5	1CVPE323	Structural Auditing	5	1CVPE366	Structural Auditing Laboratory

Open Elective II		
Course Code	Course Name	Course Offered by
IME0E103	Vehicle Engineering	Mechanical Engineering
IME0E104	Energy Engineering	
ICSOE310	Internet of Things	Computer Science and Engineering
ICSOE311	Cyber Laws and Ethical Hacking	
IEEOE306	Electrical Wiring Harnessing	Electrical Engineering
IEEOE307	Electrical Economics & Energy Audit	
1CVOE310	Operations Research	Civil Engineering
1CVOE311	Economics & Management	
1AUOE310	Vibration based fault diagnosis	Automobile Engineering
1AUOE311	Engineering Tribology	
1AEOE103	Dynamics and Control of Aerospace Vehicles	Aeronautical Engineering
1AEOE104	Space Transportation Systems	

  
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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: VII Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1##OE###	Open Elective III	3	--	--	3	ISE I	10	--	40	--	--
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC403	Design of Reinforced Concrete Structures	4	--	--	4	ISE I	10	--	40	--	--
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPE4**	Professional Elective IV	3	--	--	3	ISE I	10	--	40	--	--
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC409	Earthquake Resistant Structures	3	--	--	3	ISE I	10	--	40	--	--
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC410	Quantity Surveying & Valuation	4	--	--	4	ISE I	10	--	40	--	--
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CVPC451	Quantity Surveying & Valuation Laboratory	--	--	2	1	ISE	--	--	25	10	
						ESE	--	--	25	10	
1CVPR452	Structural Design & Drawing II	--	--	4	2	ISE	--	--	25	10	
1CVPR453	Project Phase – I	--	--	4	4	ISE	--	--	50	20	
						ESE	--	--	25	10	
1CVHS454	General Proficiency II Laboratory	--	--	2	1	ISE	--	--	25	10	
1CVPC455	Field Training	--	--	--	1	ISE	--	--	25	10	
Total		17	--	12	26	--	500	--	200	--	
Total Contact Hours/Week: 29 hrs						Total-500+200=700					

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	01	00	00	13	03	03	06
Cumulative Sum	11	20	24	67	14	09	09

  
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Sr. No.	Course Code	Professional Elective IV
1	ICVPE404	Entrepreneurship
2	ICVPE405	Hydraulic Structures
3	ICVPE406	Pavement Design & Analysis
4	ICVPE407	Advanced Design of Concrete Structures
5	ICVPE408	Design of Foundation

Open Elective III		
Course Code	Course Name	Course Offered by
1MEOE401	Total Quality Management	Mechanical Engineering
1MEOE402	Reliability Engineering	
1MEOE403	Renewable Energy Engineering	
1CSOE401	Introduction to image processing and computer vision	Computer Science and Engineering
1CSOE402	Introduction to machine learning	
1EEOE401	Electric Vehicles	Electrical Engineering
1EEOE402	Wind and Solar Energy Systems	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1AUOE401	Vehicle maintenance and safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1AEOE421	Air Traffic Control and Airport Management	Aeronautical Engineering
1AEOE422	Aircraft General Engineering Maintenance	
1AEOE423	Design of Fixed wing unmanned aerial vehicles	
0FTOE411	Process Optimization	Food Technology
0FTOE412	Cold Storage and Supply Chain Management	

  
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**Teaching and Evaluation Scheme**  
**B. Tech Civil Engineering: VIII Semester**

Course Code	Course	Teaching Scheme			
		L	T	P	Credits
ICVPE**	Professional Elective V	3	--	--	3
ICVPC416	Project & Finance Management	3	--	--	3
ICVPR456	Project Phase – II + Internship	--	--	8	8
Total		6	--	8	14
Total Contact Hours/Week: --14 hrs					

Evaluation Scheme					
Scheme	Theory (Marks)		Practical (Marks)		
	Max	Min. for Passing	Max	Min. for Passing	
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50	20	--	--	
ISE I	10	40	--	--	
MSE	30		--	--	
ISE II	10		--	--	
ESE	50	20	--	--	
ISE	--	--	250	100	
ESE	--	OE	250	100	
--	200	--	500	--	
Total – 200+500=700					

Sr. No.	Course Code	Professional Elective V
1	ICVPE411	Design of Bridges
2	ICVPE412	Management Information System
3	ICVPE413	Advanced Engineering Geology & Rock Mechanics
4	ICVPE414	Industrial Waste Water Treatment
5	ICVPE415	Human Resources Development

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	00	00	00	03	03	00	08
Cumulative Sum	11	20	24	70	17	09	17

**Comparison of AICTE & Institute Curriculum**

Course Category	HS	BS	ES	PC	PE	OE	PR	Total
AICTE	12	25	24	48	18	18	15	160
Civil Department	11	20	24	70	17	09	17	168
AICTE (%)	8.00	16.00	15.00	30.00	11.00	11.00	9.00	100
Civil Department (%)	7.00	12.00	14.00	42.00	10.00	5.00	10.00	100

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ST-CV-03/03



**Teaching and Evaluation Scheme**

**F. Y. M. Tech: I Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVSE501	Theory of Elasticity and Plasticity	3	-	-	3	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE502	Advanced Structural Analysis	3	1	-	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE503	Advanced Design of Concrete Structures	3	-	-	3	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE504	Structural Dynamics	3	1	-	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE50*	Program Elective – I	3	1	-	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE509	Research Methodology	2	-	-	2	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE551	Advanced Design of Concrete Structures Laboratory	-	-	2	1	ISE	---	---	50	20
0CVSE552	Software Application Lab	-	-	2	1	ISE	---	---	50	20
						ESE	---	POE	50	20
0CVSE553	Seminar I	-	-	2	1	ISE	---	---	50	20
Total		17	3	6	23		600		200	
Total Contact Hours/Week: 26hrs										

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Teaching and Evaluation Scheme

F. Y. M. Tech: II Semester

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
0CVSE510	Theory of Plates and Shells	3	1	-	4	ISE	20	40	--	--
						MSE	30			
						ESE	50			
0CVSE511	Finite Element Method	3	-	-	3	ISE	20	40	--	--
						MSE	30			
						ESE	50		--	--
0CVSE512	Design of Earthquake Resisting Structures	3	1	-	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE513	Advanced Design of Steel Structures	3	1	-	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE51*	Program Elective – II	3	1	-	4	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE518	Structural Audit	2	-	-	2	ISE	20	40	--	--
						MSE	30		--	--
						ESE	50		--	--
0CVSE554	Structural Laboratory	-	-	2	1	ISE	---		50	20
0CVSE555	Seminar II	-	-	2	1	ESE	---	POE	50	20
						ISE	---		100	40
Total		17	4	4	23		600		200	
Total Contact Hours/Week: 26hrs										

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0CVSE50*: Program Elective I		0CVSE51*: Program Elective II	
Course Code	Course Name	Course Code	Course Name
0CVSE505	Advanced Design of Prestressed Members	0CVSE514	Advances in Concrete Composites
0CVSE506	Design of Foundation	0CVSE515	Analysis and Design of Multistoried Building
0CVSE507	Repairs and Rehabilitation of Structures	0CVSE516	Design of RCC Bridges
0CVSE508	Structural Optimization	0CVSE517	Design of Masonry Structures

Note: - Student has to go for Internship for 1 month in the vacation between Sem. II and Sem. III. The assessment will be done at the beginning of Sem. III

  
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**Teaching and Evaluation Scheme**

**M. Tech. Structural Engineering: III Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme		
		L	T	P	Credits	Scheme	Practical (Marks)	
							Max	Min for Passing
0CVSE651	Industrial Training Assessment	-	-	-	2	ISE	100	40
0CVSE652	Dissertation Phase I	-	-	5**	5	ISE	50	20
0CVSE653	Dissertation Phase II	-	-		7	ISE	50	20
						ESE	100	40
Total		--	--	--	14		300	--
Total Contact Hours/Week: 5hrs								

Note: \*\*Average contact hours/week/student.

**M. Tech. Structural Engineering: IV Semester**

Course code	Course	Teaching Scheme				Evaluation Scheme		
		L	T	P	Credits	Scheme	Practical (Marks)	
							Max	Min for Passing
0CVSE654	Dissertation Phase III	--	--	5**	10	ISE	100	40
0CVSE655	Dissertation Phase IV	--	--		10	ISE	100	40
						ESE	100	40
Total		--	--	--	20		300	--
Total Contact Hours/Week: 5hrs								

Note:

1. \*\*Faculty contact hours per student per week.
2. Student working hours: 34 Hrs/week

Total number of Credits: 80

  
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**S.Y. B. Tech. Aeronautical Engineering: III Semester**

**Teaching and Evaluation Scheme**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	C	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for passing	Max	Min. for passing
0AEBS201	Applied Mathematics-III	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC202	Applied Thermodynamics	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC203	Fluid Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC204	Solid Mechanics	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC205	Introduction to Aerospace Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEES251	Computer Programming with C++	2	--	2	3	ISE	--	--	50	20
						ESE	--	--	50	20
0AEPC252	Applied Thermodynamics Laboratory	--	--	2	1	ISE	--	--	50	20
						ESE	--	--	50	20
0AEPC253	Fluid Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
0AEPC254	Solid Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
0AEPC255	Aircraft Component Drawing	--	--	2	1	ISE	--	--	50	20
<b>Total</b>		<b>17</b>	<b>3</b>	<b>10</b>	<b>25</b>	<b>Total</b>	<b>500</b>		<b>300</b>	
<b>Total Contact Hours/ Week=30</b>						<b>Total Marks=800</b>				

Course Category	HS	BS	ES	PC	PE	OE	PR	MC	AC
Credits	--	3	3	19	--	--	--	--	--
Cumulative Sum	3	19	32	19	--	--	--	--	--

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**S.Y. B. Tech Aeronautical Engineering: IV Semester  
Teaching and Evaluation Scheme**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	C	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for passing	Max.	Min. for passing
0AEBS206	Numerical Analysis	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC207	Aircraft Production Technology	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC208	Aircraft Materials	3	-	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC209	Aerodynamics I	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC210	Propulsion- I	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEHS211	Environmental Studies	2	--	--	--	ISE	50	Grade	--	--
0AEES256	Numerical Analysis using Programming Language	--	--	2	1	ISE	--	--	25	10
0AEPC257	Aircraft Production Technology Laboratory	--	--	2	1	ISE	--	--	50	20
0AEPC258	Aircraft Materials Laboratory	--	--	2	1	ISE	--	--	25	10
0AEPC259	Aerodynamics I Laboratory	--	--	2	1	ISE	--	--	50	20
0AEPC260	Propulsion I Laboratory	--	--	2	1	ESE	--	--	50	20
Total		17	3	10	23		500		300	
Total Contact Hours/ Week=30						Total Marks=800				

Course Category	HS	BS	ES	PC	PE	OE	PR	MC	AC
Credits	---	3	1	18	--	--	--	--	--
Cumulative Sum	3	22	33	37	--	--	--	--	--

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Teaching and Evaluation Scheme  
B. Tech: V Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	C	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for passing	Max.	Min. for passing
0AEPC301	Aircraft Structures	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC302	Aerodynamics-II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC303	Linear Control Theory	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC304	Aircraft Performance	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC305	Propulsion-II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC351	Aircraft Structures Laboratory	--	--	2	1	ISE	--	--	50	20
0AEPC352	Aerodynamics-II Laboratory	--	--	2	1	ESE	--	--	50	20
0AEPC353	Aircraft Performance Laboratory	--	--	2	1	ISE	--	--	25	10
0AEPC354	Non-destructive Testing Laboratory	2	--	2	3	ISE	--	--	25	10
0AEPC355	Computer Aided Drafting Laboratory	--	--	2	1	ISE	--	--	25	10
0AEPR356	Seminar	--	--	2	1	ISE	--	--	50	20
0AEMC306	Technical English	2	0	0	--	ESE	--	--	50	20
						ISE	--	--	--	--
						ESE	--	--	--	--
Total		19	1	12	24		500		300	
Total Contact Hours/Week = 32						Total Marks = 800				

Course Category	HS	BS	ES	PC	PE	OE	PR	MC	AC
Credits	--	--	--	23	--	--	1	--	--
Cumulative Sum	3	22	33	61	--	--	1	--	--

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Teaching and Evaluation Scheme  
B. Tech: VI Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	C	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for passing	Max.	Min. for passing
0AEPC307	Computational Fluid Dynamics	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEHS308	Economics & Management	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC309	Aircraft Stability & Control	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC310	Aircraft Design	3	1	--	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC311	Composite Materials and Structures	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEMC312	Soft Skills	2	--	--	--	--	--	--	--	--
0AEPC357	Computational Fluid Dynamics Laboratory	--	--	2	1	ISE	--	--	25	10
0AEPC358	Unmanned Aerial Vehicles Laboratory	2	--	2	2	ISE	--	--	50	20
0AEPC359	Composite Materials and Structures Laboratory	--	--	2	1	ISE	--	--	50	20
0AEPC360	Aircraft Design Laboratory	--	--	2	1	ESE	--	--	50	20
0AEPR361	Mini Project	--	--	4	2	ISE	--	--	25	10
						ISE	--	--	50	20
						ESE	--	--	50	20
<b>Total</b>		<b>18</b>	<b>2</b>	<b>12</b>	<b>24</b>		<b>500</b>		<b>300</b>	
<b>Total Contact Hours/Week=32</b>						<b>Total Marks=800</b>				

Course Category	HS	BS	ES	PC	PE	OE	PR	MC	AC
Credits	03	--	--	19	--	--	02	--	--
Cumulative Sum	06	22	33	80	--	--	03	--	--

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**Teaching and Evaluation Scheme, B. Tech: VII Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	P	T	C	Scheme	Theory Marks		Practical Marks	
							Max	Min. for passing	Max	Min. for passing
0AEPC401	Vibrations and Structural Dynamics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC402	Aircraft General Engineering Maintenance	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC420	Space Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEOE403 TO 0AEOE406	Open Elective	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPE407 TO 0AEPE4012	Program Elective- I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC451	Structural Dynamics Laboratory	--	2	--	1	ISE	--	--	50	20
0AEPC452	Aircraft Systems Laboratory	--	2	--	1	ESE	--	--	50	20
0AEPC453	Virtual Instrumentation Laboratory	--	2	--	1	ISE	--	--	50	10
0AEPC454	Aircraft General Engineering Maintenance Laboratory	--	2	--	1	ISE	--	--	50	20
0AEPR455	Industrial Training	--	--	--	1	ISE	--	--	50	20
0AEPR456	Project Phase-I	--	6	--	4	ISE	--	--	50	10
		15	14	--	24					
Total Contact Hours/ Week = 29						Total Marks = 900				

Course Code	Open Electives	Course Code	Open Electives
0AEOE403	Introduction to Flight	0AEOE405	Introduction to Gas Dynamics and Jet Propulsion
0AEOE404	Experimental Aerodynamics	0AEOE406	Introduction to UAV

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Course Code	Program Elective – I	Course Code	Program Elective – I
0AEPE407	Wind Tunnel techniques	0AEPE410	Engineering Design Optimization
0AEPE408	Heat and Mass Transfer	0AEPE411	Helicopter Theory
0AEPE409	Material Testing and Charecterization	0AEPE412	Lighter-Than-Air Systems

Course Category	HS	BS	ES	PC	PE	OE	PR	MC	AC
Credits	--	--	--	13	03	03	05	--	--
Cumulative Sum	6	22	33	93	03	03	08	--	--



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**Teaching and Evaluation Scheme, B. Tech: VIII Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	P	T	C	Scheme	Theory Marks		Practical Marks	
							Max	Min. for passing	Max	Min. for passing
0AEPC419	Avionics & Instrumentation	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC421	Finite Element Analysis	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPE413 TO 0AEPE418	Program Elective-II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPE422 TO 0AEPE427	Program Elective-III	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPE428 TO 0AEPE433	Program Elective-IV	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0AEPC457	Finite Element Analysis Laboratory	--	2	--	1	ISE	--	--	50	20
						ESE	--	--	50	20
0AEPR458	Project Phase- II	--	8	--	8	ISE	--	--	50	20
						ESE	--	--	50	20
		15	10	--	25		500	--	200	--
Total Contact Hours/ Week = 25						Total Marks = 700				



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Course Code	Program Elective – II	Course Code	Program Elective – II
0AEPE413	Hypersonic Aerodynamics	0AEPE416	Aircraft Engine Design
0AEPE414	Advanced Propulsion Systems	0AEPE417	Airline and Airport Management
0AEPE415	Advanced Mechanics of Solids	0AEPE418	Lean Six Sigma

Course Code	Program Elective – III	Course Code	Program Elective – III
0AEPE422	Automobile and Industrial Aerodynamics	0AEPE425	Navigation, Guidance and Control
0AEPE423	Combustion	0AEPE426	Flight Scheduling and Operations
0AEPE424	Experimental Stress Analysis	0AEPE427	Aircraft Rules and Regulations - DGCA (CAR)

Course Code	Program Elective – IV	Course Code	Program Elective – IV
0AEPE428	Turbulence Modeling	0AEPE431	Numerical Heat Transfer and Fluid Flow
0AEPE429	Introduction to Propellant Technology	0AEPE432	Air Traffic Control and Airport Management
0AEPE430	High Temperature Materials	0AEPE433	Probability and Statistics

Course Category	HS	BS	ES	PC	PE	OE	PR	MC	AC
Credits	-	-	-	07	09	-	08	-	-
Cumulative Sum	6	22	33	100	12	03	16	--	--

<b>L:</b> Theory Class	<b>T:</b> Tutorial Session
<b>P:</b> Practical/Lab Session	<b>C:</b> No. of Credits
<b>ISE I:</b> In-Semester Evaluation I	<b>ISE II:</b> In-Semester Evaluation II
<b>MSE:</b> Mid Semester Evaluation	<b>ESE:</b> End Semester Evaluation
<b>HS:</b> Humanities and Social Sciences	<b>PC:</b> Professional Core
<b>BS:</b> Basic Sciences	<b>OE:</b> Open Elective
<b>ES:</b> Engineering Sciences	<b>PR:</b> Seminar, Mini-project, Project
<b>MC:</b> Mandatory Course	<b>AC:</b> Audit Course



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**Annasaheb Dange College of Engineering and Technology, Ashta**  
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**Department of Aeronautical Engineering**

**Teaching and Evaluation Scheme**  
**B. Tech: Semester III (Aeronautical Engineering)**

Course code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
1AEBS201	Applied Mathematics - III	3	1	-	4	ISE 1	10	40	-	-
						MSE	30		-	-
						ISE 2	10		-	-
						ESE	50		-	-
1AEBS202	Fluid Mechanics	3	1	-	4	ISE 1	10	40	-	-
						MSE	30		-	-
						ISE 2	10		-	-
						ESE	50		-	-
1AEES203	Mechanics of Materials	3	1	-	4	ISE 1	10	40	-	-
						MSE	30		-	-
						ISE 2	10		-	-
						ESE	50		-	-
1AEES204	Applied Thermodynamics	3	1	-	4	ISE 1	10	40	-	-
						MSE	30		-	-
						ISE 2	10		-	-
						ESE	50		-	-
1AEPC205	Introduction to Aerospace Engineering	2	-	-	2	ISE 1	10	40	-	-
						MSE	30		-	-
						ISE 2	10		-	-
						ESE	50		-	-
1AEPC206	Aircraft Production Technology	2	-	-	2	ISE	25	10	-	-
1AEPC251	Aircraft Production Technology Laboratory	-	-	2	1	ISE	-	-	25	10
1AEES254	Fluid Mechanics Laboratory	-	-	2	1	ISE	-	-	25	10
						ESE	-	-	25	10
1AEES255	Mechanics of Materials Laboratory	-	-	2	1	ISE	-	-	25	10
						ESE	-	-	25	10
1AEES256	Applied Thermodynamics Laboratory	-	-	2	1	ISE	-	-	25	10
						ESE	-	-	25	10
<b>Total</b>		<b>16</b>	<b>4</b>	<b>8</b>	<b>24</b>					
<b>Total Contact Hours/Week= 28 hrs</b>										
							525		200	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	0	4	15	5	9	0	0
Cumulative Sum	3	20	39	5	9	0	0

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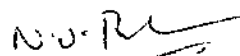
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AE ST-01/ 23

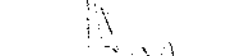
**Teaching and Evaluation Scheme**  
**B. Tech: Semester IV (Aeronautical Engineering)**

Course Code	Course Name	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Theory (Marks)			Practical (Marks)		
						Scheme	Max	Min for Passing	Max	Min for Passing	
1AEES207	Numerical Analysis with Programming Language	3	-	-	3	ISE 1	10	40	-	-	
						MSE	30				
						ISE 2	10				
						ESE	50	20			
1AEPC208	Low Speed Aerodynamics	3	1	-	4	ISE 1	10	40	-	-	
						MSE	30				
						ISE 2	10				
						ESE	50	20			
1AEPC209	Air Breathing Propulsion	3	1	-	4	ISE 1	10	40	-	-	
						MSE	30				
						ISE 2	10				
						ESE	50	20			
1AEPC210	Aerospace Materials and Structures	3	-	-	3	ISE 1	10	40	-	-	
						MSE	30				
						ISE 2	10				
						ESE	50	20			
1AEPC211	Aircraft Systems and Instruments	3	-	-	3	ISE 1	10	40	-	-	
						MSE	30				
						ISE 2	10				
						ESE	50	20			
1AEHS252	Professional Ethics	-	-	2	2	ISE	-	-	-	25	10
1AEMC253	Environmental Studies	2	-	-	-	ISE	-	-	-	25	10
1AEES257	Numerical Analysis with Programming Language Laboratory	-	-	2	1	ISE	-	-	-	25	10
1AEPC258	Low Speed Aerodynamics Laboratory	-	-	2	1	ISE	-	-	-	25	10
						ESE	-	-	POE	25	10
1AEPC259	Air Breathing Propulsion Laboratory	-	-	2	1	ISE	-	-	-	25	10

  
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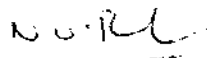



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**Department of Aeronautical Engineering**


IAEPC260	Aerospace Materials and Structures Laboratory	-	-	2	1	ISE	-	-	-	25	10
						ESE	-	-	POE	25	10
Total		17	2	10	23		500			200	
Total Contact Hours/Week: 29 Hours											

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	2	0	4	17	0	0	0
Cumulative Sum	5	20	43	22	0	0	0

  
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**Teaching and Evaluation Scheme**  
**B. Tech: Semester V (Aeronautical Engineering)**

B. Tech. Semester V (Aeronautical Engineering)											
Course code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1AEPC301	Aircraft Structures	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30			-	-
						ISE 2	10			-	-
						ESE	50			20	-
1AEPC302	Flight Dynamics	3	1	-	4	ISE 1	10	-	40	-	-
						MSE	30			-	-
						ISE 2	10			-	-
						ESE	50			20	-
1AEPC303	High Speed Aerodynamics	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30			-	-
						ISE 2	10			-	-
						ESE	50			20	-
1AEPC304	Acrospace Propulsion	3	1	-	4	ISE 1	10	-	40	-	-
						MSE	30			-	-
						ISE 2	10			-	-
						ESE	50			20	-
1AEPE305 - 310	Professional Elective - 1	3	-	-	3	ISE 1	10	-	40	-	-
				MSE	30	-	-				
				ISE 2	10	-	-				
				ESE	50	20	-			-	
1AEOE311 -315	Open Elective - 1	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30			-	-
						ISE 2	10			-	-
						ESE	50			20	-
1AEPE351	Self-Learning Course (Supervised Learning)	-	-	-	1	ISE	-	-	-	50	20
1AEHS352	Communication Skills and Competencies	-	-	2	1	ISE	-	-	-	50	20
1AEPC356	Aircraft Structures Laboratory	-	-	2	1	ISE	-	-	-	25	10
						ESE	-	-	POE	25	10
1AEPC357	Flight Dynamics Laboratory	-	-	2	1	ISE	-	-	-	25	10
						ESE	-	-	POE	25	10
Total		18	2	6	24	600			200		
Total Contact Hours/Week= 26 hrs											

  
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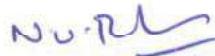
**Department of Aeronautical Engineering**

*Course Code	Professional Elective-I
1AEPE305	Experimental Aerodynamics
1AEPE306	Heat and Mass Transfer
1AEPE307	Material Testing and Characterization
1AEPE308	Engineering Design Optimization
1AEPE309	Helicopter Theory
1AEPE310	Lighter-Than-Air Systems

**Open Elective –I**

Courses Code	Course Name	Department
1AEOE311	Introduction to Flight	Aeronautical Engineering
1AEOE312	Introduction to Experimental Aerodynamics	
1AEOE313	Introduction to Gas Dynamics and Jet Propulsion	
1AEOE314	Introduction to Unmanned Aerial Vehicles	
1AUOE301	Product Design and Development	Automobile Engineering
1AUOE302	Automotive Refrigeration and Air Conditioning	
1CVOE301	Air Pollution & Control	Civil Engineering
1CVOE302	Remote Sensing & GIS Applications	
1CSOE301	Database Essentials and Business Intelligence	Computer Science and Engineering
1CSOE302	Software Engineering and Project Management	
1CSOE303	Data Structures and Algorithms	
1EEOE301	Electrical Technology	Electrical Engineering
1EEOE302	Electrical and Electronics Measurements	
0FTOE311	Packaging Technology	Food Engineering
1MEOE301	Industrial Automation and Robotics	Mechanical Engineering
1MEOE302	Composite Materials	
1MEOE303	Solar Technology	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	1	-	-	16	4	3	-
Cumulative Sum	6	20	43	38	4	3	-



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**Teaching and Evaluation Scheme**  
**B. Tech: Semester VI (Aeronautical Engineering)**

B. Tech Semester VI (Aeronautical Engineering)											
Course code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing		Max	Min. for Passing
1AEPC305	Vibration and Structural Dynamics	3	-	-	3	ISE 1	10	- 40	- - -	-	
						MSE	30				
						ISE 2	10				
						ESE	50				20
1AEPC306	Computational Fluid Dynamics	3	-	-	3	ISE 1	10	- 40	- - -	-	
						MSE	30				
						ISE 2	10				
						ESE	50				20
1AEPC307	Space Dynamics	3	-	-	3	ISE 1	10	- 40	- - -	-	
						MSE	30				
						ISE 2	10				
						ESE	50				20
1AEPE316 - 320	Professional Elective - 2	3	-	-	3	ISE 1	10	- 40	- - -	-	
						MSE	30				
						ISE 2	10				
						ESE	50				20
1AEOE321 - 325	Open Elective - 2	3	-	-	3	ISE 1	10	- 40	- - -	-	
						MSE	30				
						ISE 2	10				
						ESE	50				20
1AEHS353	Constitution of India	2	-	-	2	ISE	-	-	-	25	10
1AEPR354	Internship	-	-	-	2	ISE	-	-	-	25	10
1AEPR355	Mini - Project	-	-	4	2	ISE	-	-	-	25	10
						ESE	-	-	-	25	10
1AEPC358	Vibration and Structural Dynamics Laboratory	-	-	2	1	ISE	-	-	-	25	10
						ESE	-	-	POE	25	10
1AEPC359	Computational Fluid Dynamics Laboratory	-	-	2	1	ISE	-	-	-	25	10
						ESE	-	-	POE	25	10
Total		17	0	8	23		500			200	
Total Contact Hours/Week= 25hrs											

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AE ST - 06/10





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**Department of Aeronautical Engineering**

*Course Code	Professional Elective-II
1AEPE316	Hypersonic Aerodynamics
1AEPE317	Advanced Propulsion Systems
1AEPE318	Advanced Mechanics of Solids
1AEPE319	Introduction to Air Transportation and Flight Scheduling
1AEPE320	Introduction to Aircraft Design

**Open Elective -II**

Courses Code	Course Name	Department
1AEOE321	Lighter Than Air Systems	Aeronautical Engineering
1AEOE322	Airline and Airport Management	
1AEOE323	Flight Scheduling and Operations	
1AUOE310	Vibration based fault diagnosis	Automobile Engineering
1AUOE311	Engineering Tribology	
1CVOE310	Operation Research	Civil Engineering
1CVOE311	Economics And Management	
1CSOE311	Internet of Things	Computer Science and Engineering
1CSOE312	Cyber Laws and Ethical Hacking	
1EEOE306	Electrical Wiring Harnessing	Electrical Engineering
1EEOE307	Electrical Economics & Energy Audit	
0FTOE321	Process Modeling and Simulation	Food Engineering
1MEOE304	Industrial Management and Operation Research	Mechanical Engineering
1MEOE305	Non-Destructive Testing	
1MEOE306	Computational Fluid Dynamics	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	2	-	-	11	3	3	4
Cumulative Sum	8	20	43	49	7	6	4

  
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AC ST-07/10

Course code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
Max	Min. for Passing						Max	Min. for Passing			
1AEPC401	Finite Element Methods	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30				
						ISE 2	10				
						ESE	50			20	-
1AEPC402	Introduction to Control Systems	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30				
						ISE 2	10				
						ESE	50			20	-
1AEPE403 - 408	Professional Elective - 3	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30				
						ISE 2	10				
						ESE	50			20	-
1AEPE409 - 414	Professional Elective - 4	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30				
						ISE 2	10				
						ESE	50			20	-
1AEOE421 - 424	Open Elective - 3	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30				
						ISE 2	10				
						ESE	50			20	-
1AEHS407	Project and Finance Management	2	-	-	2	ISE 1	10	-	40	-	-
						MSE	30				
						ISE 2	10				
						ESE	50			20	-
1AEPR451	Project Phase 1	-	-	8	4	ISE	-	-	-	75	30
1AEPC454	Finite Element Methods Laboratory	-	-	2	1	ISE	-	-	-	25	10
						ESE	-	-	POE	25	10
Total		17	0	10	22		600			125	
Total Contact Hours/Week= 27hrs											

*Course Code	Professional Elective-III
1AEPE403	Turbulence Modeling
1AEPE404	Avionics and Aircraft Systems
1AEPE405	Theory of Elasticity
1AEPE406	Aircraft Rules and Regulations - DGCA (CAR)
1AEPE407	Design of Unmanned Aerial Systems
1AEPE408	Quality Engineering and Management

  
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*Course Code	Professional Elective-IV
1AEPE409	Automobile and Industrial Aerodynamics
1AEPE410	Numerical Heat Transfer and Fluid Flow
1AEPE411	Experimental Stress Analysis
1AEPE412	Airframe Maintenance and Repair
1AEPE413	Aircraft Engine Design
1AEPE414	Product Life Cycle Management

**Open Elective –III**

Courses Code	Course Name	Department
1AEOE421	Air Traffic Control and Airport Design	Aeronautical Engineering
1AEOE422	Aircraft General Engineering Maintenance	
1AEOE423	Design of Fixed wing unmanned aerial vehicles	
1AUOE401	Vehicle maintenance and safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1CSOE401	Introduction to image processing and computer vision	Computer Science and Engineering
1CSOE402	Introduction to machine learning	
1EEOE401	Electric Vehicles	Electrical Engineering
1EEOE402	Wind and Solar Energy Systems	
0FTOE411	Process Optimization	Food Technology
0FTOE412	Cold Storage and Supply Chain Management	
1MEOE401	Total Quality Management	Mechanical Engineering
1MEOE402	Reliability engineering	
1MEOE403	Renewable Energy Engineering	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	02	-	-	04	06	03	04
Cumulative Sum	08	20	43	56	13	09	08

  
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**Teaching and Evaluation Scheme**  
**B. Tech: Semester VIII (Aeronautical Engineering)**

Course code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max	Min. for Passing	Max	Min. for Passing	
1AEHS408	Entrepreneurship Essentials	2	-	-	2	ISE 1	10	-	40	-	-
						MSE	30			-	-
						ISE 2	10			-	-
						ESE	50			20	-
1AEPE415 - 420	Professional Elective - 5	3	-	-	3	ISE 1	10	-	40	-	-
						MSE	30			-	-
						ISE 2	10			-	-
						ESE	50			20	-
1AEPR453	Project Phase 2/Internship	-	-	12	6	ISE	-	-	-	100	40
						ESE	-	-	POE	50	20
Total		5	0	12	11		200			150	
Total Contact Hours/Week= 17hrs											

*Course Code	Professional Elective-V
1AEPE415	Nanomaterials and Nanotechnology
1AEPE416	Non - Destructive Testing
1AEPE418	Airframe Maintenance and Repair
1AEPE420	Cryogenics

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	02	-	-	-	03	-	06
Cumulative Sum	10	20	43	56	16	09	14

  
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**Annasaheb Dange College of Engineering  
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## **Structure and Curriculum**

### **F.Y. B. Tech.**

**(Common to All Branches)**

**Academic Year 2017-2018**



Teaching and Evaluation Scheme  
B. Tech: Semester I (Physics Group)

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 101	Applied Physics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 102	Applied Mathematics I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 103	Basic Electrical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 104	Basic Civil Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 105	Engineering Graphics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSHS 106	Professional Communication	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 107	Applied Mathematics I Tutorial	--	1	--	1	ISE	--	--	25	10
OBSES 151	Workshop Practice I	--	--	2	1	ISE	--	--	50	20
OBSBS 152	Applied Physics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 153	Basic Electrical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 154	Basic Civil Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 155	Engineering Graphics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSHS 156	Professional Communication Laboratory	--	--	2	1	ISE	--	--	25	10
Total		17	1	12	24		600		200	
Total Contact Hours/Week: 30 hrs										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	3	8	13					
Cumulative Sum	3	8	13					





Teaching and Evaluation Scheme  
B. Tech: Semester I (Chemistry Group)

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 108	Applied Chemistry	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 102	Applied Mathematics I	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 109	Basic Electronic Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 110	Engineering Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 111	Basic Mechanical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 112	Computer Programming	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 107	Applied Mathematics I Tutorial	--	1	--	1	ISE	--	--	25	10
OBSES 157	Basic Electronic Engineering Laboratory	--	--	2	1	ISE	--	--	50	20
OBSBS 158	Applied Chemistry Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 159	Engineering Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 160	Basic Mechanical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 161	Computer Programming Laboratory	--	--	4	2	ISE	--	--	50	20
Total		17	1	12	24		600		200	
Total Contact Hours/Week: 30 hrs										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	0	8	16					
Cumulative Sum	0	8	16					



**Teaching and Evaluation Scheme  
B. Tech: Semester II (Physics Group)**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 101	Applied Physics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 113	Applied Mathematics II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 103	Basic Electrical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 104	Basic Civil Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 105	Engineering Graphics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSHS 106	Professional Communication	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 114	Applied Mathematics II Tutorial	--	1		1	ISE	--	--	25	10
OBSES 151	Workshop Practice I	--	--	2	1	ISE	--	--	50	20
OBBSBS 152	Applied Physics Laboratory	--	--	2	1	ISE	--	--	25	10
OBBSBS 153	Basic Electrical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBBSBS 154	Basic Civil Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBBSBS 155	Engineering Graphics Laboratory	--	--	2	1	ISE	--	--	25	10
OBBSBS 156	Professional Communication Laboratory	--	--	2	1	ISE	--	--	25	10
<b>Total</b>		<b>17</b>	<b>1</b>	<b>12</b>	<b>24</b>		<b>600</b>		<b>200</b>	
<b>Total Contact Hours/Week: 30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
<b>Credits</b>	<b>3</b>	<b>8</b>	<b>13</b>					
<b>Cumulative Sum</b>	<b>3</b>	<b>16</b>	<b>29</b>					





**ANNASAHEB DANGE COLLEGE OF ENGINEERING AND TECHNOLOGY,  
ASHTA**

(An Autonomous Institute)

F.Y. B. Tech (Common to All Branches)

**Teaching and Evaluation Scheme  
B. Tech: Semester II (Chemistry Group)**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)	
							Max	Min. for Passing	Max	Min. for Passing
OBSBS 108	Applied Chemistry	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 113	Applied Mathematics II	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 109	Basic Electronic Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 110	Engineering Mechanics	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 111	Basic Mechanical Engineering	3	--	--	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSES 112	Computer Programming	2	--	--	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
OBSBS 114	Applied Mathematics II Tutorial	--	1	--	1	ISE	--	--	25	10
OBSES 157	Basic Electronic Engineering Laboratory	--	--	2	1	ISE	--	--	50	20
OBSBS 158	Applied Chemistry Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 159	Engineering Mechanics Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 160	Basic Mechanical Engineering Laboratory	--	--	2	1	ISE	--	--	25	10
OBSES 161	Computer Programming Laboratory	--	--	4	2	ISE	--	--	50	20
<b>Total</b>		<b>17</b>	<b>1</b>	<b>12</b>	<b>24</b>		<b>600</b>		<b>200</b>	
<b>Total Contact Hours/Week: 30 hrs</b>										

Course Category	HS	BS	ES	PC	PE	OE	MC	AC
Credits	0	8	16					
Cumulative Sum	3	16	29					

Head of Department

Dean Academics

Principal

Executive Director



**Annasaheb Dange College of Engineering and  
Technology, Ashta**

**An Autonomous Institute affiliated to Shivaji  
University, Kolhapur**

**Curriculum Structure**

**S. Y. B. Tech.  
COMPUTER SCIENCE AND ENGINEERING**

**SEM III & SEM IV**

**(Academic Year 2018-19)**





# Department of Computer Science & Engineering

## Teaching and Evaluation Scheme

### B. Tech.: III Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max	Min. for Passing	Max	Min. for Passing
0CSBS201	Discrete Mathematics	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC202	Data Structures	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC203	Data Communication	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC204	Processor Architectures	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSBS205	Statistics and Fuzzy Systems	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC251	Data Structures Laboratory	0	0	4	2	ISE	--		50	20
						ESE	POE		50	20
0CSPC252	Processor Architectures Laboratory	0	0	2	1	ISE	--		50	20
						ESE	POE		50	20
0CSES253	Programming Laboratory-I	2	0	4	4	ISE	--		50	20
						ESE	POE		50	20
0CSAC211	Communication Skills	0	1	0	-	ISE	Grade		50	20
Total		17	3	10	24		500		300	
Total Contact Hours/ Week: 30Hrs										

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	-	8	4	12	-	-	-
Cumulative Sum	3	24	33	12	-	-	-

Head of Department



Director

Executive Director

**Teaching and Evaluation Scheme  
B. Tech.: IV Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max	Min. for Passing	Max	Min. for Passing
0CSBS206	Theory of Computer Science	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC207	Computer Networks	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC208	Operating System-I	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC209	Software Engineering	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC210	Computer Architecture	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC254	Operating System-I Laboratory	0	0	2	1	ISE	--	--	25	10
0CSPC255	Computer Networks Laboratory	0	0	2	1	ESE	POE	POE	50	20
0CSES256	Programming Laboratory- II	2	0	4	4	ISE	--	--	25	10
0CSPR257	Mini-Project	0	0	2	1	ESE	POE	POE	50	20
0CSMC212	Environmental Studies	2	0	0	-	ISE	--	--	25	10
						ESE	POE	POE	25	10
						ISE	Grade	Grade	50	20
<b>Total</b>		<b>19</b>	<b>1</b>	<b>10</b>	<b>23</b>		<b>500</b>		<b>300</b>	
<b>Total Contact Hours/Week: 30hrs</b>										

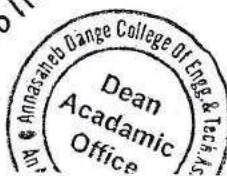
Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	-	4	4	14	-	-	01
Cumulative Sum	3	28	37	26	-	-	01

Head of Department

Dean Academics

Director

Executive Director







# **Annasaheb Dange College of Engineering and Technology, Ashta**

(An Autonomous Institute affiliated to Shivaji University, Kolhapur.)

## **Structure and Curriculum**

**T. Y. B. Tech.  
COMPUTER SCIENCE AND ENGINEERING**

**SEM V & SEM VI**

**(Academic Year 2019-20)**

B. Tech Semester V  
Teaching and Evaluation Scheme

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max	Min. for Passing	Max.	Min. for Passing
0CSPC301	Internet of Things	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC302	Computer Algorithms	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC303	System Software	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC304	Information and Network Security	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC305	Database Engineering	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC351	Computer Algorithms Laboratory	0	0	2	1	ISE			50	20
0CSPC352	Database Engineering Laboratory	0	0	4	2	ISE			50	20
						ESE	POE		50	20
0CSPE3**	Professional Elective- I	2	0	2	3	ISE			50	20
						ESE	POE		50	20
0CSPR356	Theme Based Mini Project	0	0	2	1	ISE			50	20
						ESE	OE		50	20
0CSAC314	Entrepreneurship Development and Planning	2	0	0	-	Grades				
Total		19	1	10	23		500		350	
Total Contact Hours/Week: 30hrs										

HOD

Dean Academics

Director

Executive Director





Annasaheb Dange College of Engineering and Technology, Ashta  
Department of Computer Science & Engineering

**Professional Elective – I**

1. Advanced Programming - 53
2. Software Testing and Quality Assurance - 54
3. Network Administration - 55

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	-	-	-	19	3	-	1
Cumulative Sum	3	28	37	45	3	-	2

HOD

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Executive Director

TYCS 03/04

**Teaching and Evaluation Scheme**  
**B. Tech Semester VI**

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for Passing	Max.	Min. for Passing
0CSPC306	Advanced Database System	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC307	Machine Learning	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPE3**	Professional Elective- II	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPE3**	Professional Elective- III	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC357	Unix & Shell Programming Laboratory	0	0	2	1	ISE I			50	20
0CSPC358	Object Oriented Modeling and Design	2	0	2	3	ISE			50	20
						ESE	POE		50	20
0CSPC359	Advanced Database System Laboratory	0	0	2	1	ISE			50	20
						ESE	POE		50	20
0CSPC360	Web Programming	2	0	4	4	ISE			50	20
						ESE	POE		50	20
0CSAC315	Soft Skills	0	1	0	-	Grade				
Total		16	4	10	24		400		350	
Total Contact Hours/Week: 30 hrs										

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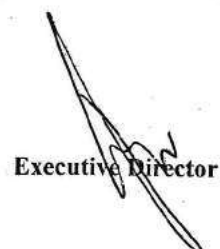
<b>Professional Electives- II</b> 1. Digital Image Processing - 08 2. Ad hoc Networks. - 09 3. Advanced Data Structures -10	<b>Professional Electives- III</b> 1. Computer Graphics & Multimedia Techniques - 11 2. Storage Network - 12 3. Cyber Security - 13
--	--

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	-	-	-	16	8	-	-
Cumulative Sum	3	28	37	61	11	-	2

  
HOD

  
Dean Academics

  
Director

  
Executive Director



Department of Computer Science & Engineering



# **AnnasahebDange College of Engineering and Technology, Ashta**

(An Autonomous Institute affiliated to Shivaji University, Kolhapur)

## **Curriculum Structure and Syllabus**

### **B. Tech. COMPUTER SCIENCE AND ENGINEERING**

#### **SEM VII& SEM VIII**

(Academic Year 2020-21)





# Department of Computer Science & Engineering

## Teaching and Evaluation Scheme

### B. Tech: VII Semester

CourseCode	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for Passing	Max.	Min. for Passing
0CSPC401	Distributed and Cloud Computing	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC402	Big Data Analytics	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSOE4**	Open Elective	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSHS405	Project Management	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
0CSPC451	Distributed and Cloud Computing Laboratory	0	0	2	1	ISE	--		50	20
0CSPC452	Big Data Analytics Laboratory	0	0	2	1	ESE	POE		50	20
0CSPE4**	Professional Elective- IV	2	0	2	3	ISE	--		50	20
						ESE	POE		50	20
0CSPR456	Pre-project	0	0	5	5	ISE	--		50	20
						ESE	POE		50	20
0CSHS457	Design Thinking	0	0	2	1	ISE	--		50	20
Total		14	1	13	24		400		400	
Total Contact Hours/ Week: 28Hrs										

22/06/2020  
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B.Tech-ST-01/04



## Department of Computer Science & Engineering

### Professional Elective- IV

1. Deep Learning - 53
2. Parallel Programming -54
3. Advanced Web Programming -55

### Open Elective

Course Name	Course Offered by
Industrial Management and Operational Research	Mechanical Engineering
Industrial Automation and Robotics	
Database Essentials and Business Intelligence - 0CSOE403	Computer Science and Engineering
Machine Learning - 0CSOE404	
Electrical and Hybrid Vehicles	Electrical Engineering
Industrial Automation PLC and SCADA	
Air Pollution Control	Civil Engineering
Disaster Management	
Research Methodology	
Hybrid Vehicles	Automobile Engineering
Experimental Aerodynamics	Aeronautical Engineering
Introduction to Unmanned Aerial Vehicle	
Microcontroller and Interfacing	Electronics and Telecommunication
Image Processing	

### Total Credits for semester VII:

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	5	-	-	8	3	3	5
Cumulative Sum	8	28	37	69	14	3	7

  
22/06/2020  
HOD

  
Dean Academics

  
Director

  
Executive Director

B.Tech - ST-02/04





## Department of Computer Science & Engineering

### Teaching and Evaluation Scheme B. Tech.: VIII Semester

B. Tech. - V Semester											
Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks		
							Max.	Min. for Passing	Max.	Min. for Passing	
0CSPE4**	Professional Elective- V	3	0	0	3	ISE I	10		40	--	--
						MSE	30			--	--
						ISE II	10			--	--
						ESE	50	20		--	--
0CSPE4**	Professional Elective- VI	3	0	0	3	ISE I	10		40	--	--
						MSE	30			--	--
						ISE II	10			--	--
						ESE	50	20		--	--
0CSPR458	Project Industry* or Institute	0	0	20#	20	ISE	--			50	20
						ESE	POE			50	20
Total		6	0	20	26						
Total Contact Hours/ Week: 26											

\*Students opting for an industry-based project may use MOOCs for learning professional electives. Professional Electives will be announced at the commencement of the semester based on the latest trends and the availability of courses on MOOCs. Blended learning strategy like flipped classroom can be used by the course coordinator.

For project, batch should be of 9 students.

#Student working hours:20

For project, faculty contact hours:10

#### Total Credits for semester VIII:

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	--	--	--	--	06	--	20
Cumulative Sum	8	28	37	69	20	3	27

  
22/06/2020  
HOD

  
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B.Tech - ST-03/04



## Department of Computer Science & Engineering

Total Credits Category Wise/ Semester Wise:

Sem	HS	BS	ES	PC	PE	OE	PR	Total
I	3	8	13	-	-	-	-	24
II		8	16	-	-	-	-	24
III	-	8	4	12	-	-	-	24
IV		4	4	14			01	23
V				19	3	-	1	23
VI	-	-	-	16	8	-	-	24
VII	5	-	-	8	3	3	5	24
VIII	--	--	--	--	06	--	20	26
Total	8	28	37	69	20	3	27	192
%	4.16	14.58	19.27	35.93	10.42	1.56	14.06	100

  
22/06/2020  
HOD

  
Dean Academics

  
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B.Tech - ST-04/04





# **Annasaheb Dange College of Engineering and Technology, Ashta**

(An Autonomous Institute affiliated to Shivaji University, Kolhapur.)

## **Curriculum Structure**

**First to Final Year B. Tech.  
COMPUTER SCIENCE AND ENGINEERING**

**SEM I to SEM VIII**

**(To be implemented from Academic Year 2019-20)**

**Teaching and Evaluation Scheme**  
**B. Tech: I Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks		
							Max.	Min. for Passing	Max.	Min. for Passing	
1CSBS101	Applied Mathematics - I	3	1	0	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CSBS102	Engineering Physics and Chemistry	4	0	0	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CSES103	Basic Electrical Engineering	3	0	0	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CSES104	Engineering Mechanics	3	0	0	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CSES105	Basic Electronics Engineering	2	0	0	2	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
1CSBS151	Engineering Physics and Chemistry Laboratory	0	0	2	1	ISE	--		50	20	
1CSES152	Basic Electronics Engineering Laboratory	0	0	2	1	ISE	--		50	20	
1BSHS153	Professional Communication	2	0	2	3	ISE	--		50	20	
Total						17	1	6	21		
Total Contact Hours/ Week: 24 Hrs											
Course Category	HS	BS		ES		PC	PE	OE	PR		
Credits	3	9		9		-	-	-	-		
Cumulative Sum	3	9		9		-	-	-	-		

**HOD**

**Dean Academics**

**Director**

**Executive Director**





**Teaching and Evaluation Scheme**

**B. Tech: II Semester**

CourseCode	Course	Teaching Scheme				Scheme	Evaluation Scheme			
		L	T	P	Credits		Theory Marks		Practical Marks	
							Max.	Min. for Passing	Max.	Min. for Passing
1CSBS106	Applied Mathematics- II	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		20	--
1CSPC107	Data Communication	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		20	--
1CSES108	Basic Mechanical Engineering	2	0	0	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		20	--
1CSES109	Engineering Graphics	2	0	0	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		20	--
1CSBS110	Biology for Engineers	2	0	0	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		20	--
1CSES154	Engineering Graphics Laboratory	0	0	2	1	ISE	--		50	20
1CSBS155	Biology for Engineers Laboratory	0	0	2	1	ISE	--		50	20
1CSES156	Computer Programming	3	0	4	5	ISE	--		50	20
						ESE	POE		50	20
Total		15	1	08	20		500		200	
Total Contact Hours/ Week: 24Hrs										
Course Category	HS	BS		ES	PC	PE	OE		PR	
Credits	-	7		10	3	-	-		-	
Cumulative Sum	3	16		19	3	-	-		-	

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CS ST-03/13

**Teaching and Evaluation Scheme**  
**B. Tech: III Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks		
							Max.	Min. for Passing	Max.	Min. for Passing	
1CSBS201	Discrete Mathematics	3	1	0	4	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CSPC202	Data Structures	3	0	0	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CSPC203	Computer Networks	3	0	0	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CSPC204	Processor Architecture	3	0	0	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CSPC205	Software Engineering	3	0	0	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		--	--	
1CSPC251	Data Structures Laboratory	0	0	2	1	ISE	--		50	20	
						ESE	POE		50	20	
1CSPC252	Computer Networks Laboratory	0	0	2	1	ISE	--		50	20	
						ESE	POE		50	20	
1CSPC253	Processor Architecture Laboratory	0	0	2	1	ISE	--		50	20	
1CSPC254	Programming Laboratory- I	2	0	2	3	ISE	--		50	20	
						ESE	POE		50	20	
<b>Total</b>		<b>17</b>	<b>1</b>	<b>8</b>	<b>22</b>		<b>500</b>		<b>350</b>		
<b>Total Contact Hours/ Week: 26 Hrs</b>											
<b>Course Category</b>	<b>HS</b>	<b>BS</b>		<b>ES</b>		<b>PC</b>	<b>PE</b>	<b>OE</b>		<b>PR</b>	
<b>Credits</b>	-	4		-		18	-	-		-	
<b>Cumulative Sum</b>	3	20		19		21	-	-		-	

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CS ST-04/13



**Teaching and Evaluation Scheme**  
**B. Tech: IV Semester**

Course Code	Course	Teaching Scheme				Evaluation Scheme							
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks				
							Max.	Min. for Passing	Max.	Min. for Passing			
1CSBS206	Statistics and Fuzzy Systems	3	1	0	4	ISE I	10	40	--	--			
						MSE	30		--	--			
						ISE II	10		--	--			
						ESE	50		20	--	--		
1CSPC207	Theory of Computation	3	1	0	4	ISE I	10	40	--	--			
						MSE	30		--	--			
						ISE II	10		--	--			
						ESE	50		20	--	--		
1CSPC208	Operating Systems	3	0	0	3	ISE I	10	40	--	--			
						MSE	30		--	--			
						ISE II	10		--	--			
						ESE	50		20	--	--		
1CSPC209	Database Engineering	3	0	0	3	ISE I	10	40	--	--			
						MSE	30		--	--			
						ISE II	10		--	--			
						ESE	50		20	--	--		
1CSPC210	Computer Architecture	3	0	0	3	ISE I	10	40	--	--			
						MSE	30		--	--			
						ISE II	10		--	--			
						ESE	50		20	--	--		
1CSPC255	Operating Systems Laboratory	0	0	2	1	ISE	--		50	20			
1CSPC256	Database Engineering Laboratory	0	0	2	1	ESE	POE		50	20			
1CSPC257	Programming Laboratory- II	2	0	4	4	ISE	--		50	20			
						ESE	POE		50	20			
1CSMC211	Environmental Studies	2	0	0	-	ISE	Grade						
Total						19	2	8	23	500	300		
Total Contact Hours/ Week: 29Hrs													
Course Category	HS	BS		ES		PC	PE	OE		PR			
Credits	-	4		-		19	-	-		-			
Cumulative Sum	3	24		19		40	-	-		-			

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CSST-05/18

**Teaching and Evaluation Scheme**  
**B. Tech: V Semester**

CourseCode	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for Passing	Max.	Min. for Passing
1CSOE3**	Open Elective- I	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPC304	System Programming and Compilers	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPC305	Design and Analysis of Algorithms	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPC306	Internet of Things	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPE3**	Professional Elective- I	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPC351	Design and Analysis of Algorithms Laboratory	0	0	2	1	ISE	--		50	20
1CSPC352	Web Programming	2	0	2	3	ISE	--		50	20
						ESE	POE		50	20
1CSPE3**	Professional Elective - II	2	0	2	3	ISE	--		50	20
						ESE	POE		50	20
1CSPR356	Mini Project	0	0	2	1	ISE	--		50	20
						ESE	OE		50	20
1CSPR357	Internship/ Intra institute / Inter institute activities	-	-	-	1*	ISE	--		50	20
1CSMC310	Technical Writing	1	1	0	0	Grade				
<b>Total</b>		<b>20</b>	<b>2</b>	<b>8</b>	<b>25</b>		<b>500</b>		<b>400</b>	
<b>Total Contact Hours/ Week: 30 Hrs</b>										

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CS ST-06/12



\*Students shall undergo Internship/ Intra institute / Inter institute activities after B. Tech Semester IV examination during summer vacation for 2 weeks. Assessment shall be carried out in B. Tech V Semester.

<b>Professional Elective- I</b> 1. Storage Networks - 07 2. Ad Hoc Networks - 08 3. Cyber Security - 09	<b>Professional Elective – II</b> 1. Advanced Programming - 53 2. Computer Graphics & Multimedia Techniques - 54 3. Unix and Shell Programming - 55
--	--

**Open Elective- I**

Course Code	Course Name	Course Offered by
1ME0E101	Machines and Mechanisms	Mechanical Engineering
1ME0E102	Manufacturing Engineering	
1CSOE301	Database Essentials	Computer Science and Engineering
1CSOE302	Software Engineering and Project Management	
1CSOE303	Data Structures and Algorithms	
1EEOE301	Electrical Technology	Electrical Engineering
1EEOE302	Electrical and Electronics Measurements	
1CVOE301	Air Pollution & Control	Civil Engineering
1CVOE302	Remote Sensing & GIS Applications	
1AUOE301	Product design and development	Automobile Engineering
1AUOE302	Automotive Refrigeration and air conditioning	
1AEOE101	Introduction to Aerospace Engineering	Aeronautical Engineering
1AEOE102	Drone Piloting	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	-	-	-	14	6	3	2
Cumulative Sum	3	24	19	54	6	3	2



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CSST-07/13

Teaching and Evaluation Scheme

B. Tech: VI Semester

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for Passing	Max.	Min. for Passing
1CSOE3**	Open Elective- II	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSHS313	Entrepreneurship Development and Planning	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPC314	Advanced Database System	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPC315	Machine Learning	3	1	0	4	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPE3**	Professional Elective- III	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50	20	--	--
1CSPC358	Advanced Database System Laboratory	0	0	2	1	ISE	--		50	20
						ESE	POE		50	20
1CSPC359	Object Oriented Modeling and Design	2	0	2	3	ISE	--		50	20
						ESE	POE		50	20
1CSPE3**	Professional Elective- IV	2	0	2	3	ISE	--		50	20
						ESE	POE		50	20
1CSPR363	Internship/ Intra institute / Inter institute activities	-	-	-	1*	ISE	--		50	20
1CSMC319	Constitution of India	2	0	0	-	Grade				
Total		21	1	6	24		500		350	
Total Contact Hours/ Week: 28 Hrs										

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\*Students shall undergo Internship/ Intra institute / Inter institute activities after B. Tech Semester V examination during winter vacation for 2 weeks. Assessment shall be carried out in B. Tech VI Semester.

<b>Professional Elective- III</b> 1. Software Testing and Quality Assurance - 16 2. Advanced Data Structures - 17 3. Real Time System - 18	<b>Professional Elective – IV</b> 1. Augmented and Virtual Reality - 60 2. Digital Image Processing - 61 3. Open Source Technologies - 62
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**Open Elective – II**

Courses Code	Course Name	Department
IAEOE321	Lighter Than Air Systems	Aeronautical Engineering
IAEOE322	Airline and Airport Management	
IAEOE323	Flight Scheduling and Operations	
IAUOE310	Vibration based fault diagnosis	Automobile Engineering
IAUOE311	Engineering Tribology	
ICVOE310	Operation Research	Civil Engineering
ICVOE311	Economics And Management	
ICSOE311	Internet of Things	Computer Science and Engineering
ICSOE312	Cyber Laws and Ethical Hacking	
IEEOE306	Electrical Wiring Harnessing	Electrical Engineering
IEEOE307	Electrical Economics & Energy Audit	
0FTOE321	Process Modeling and Simulation	Food Engineering
IMEOE304	Industrial Management and Operation Research	Mechanical Engineering
IMEOE305	Non-Destructive Testing	
IMEOE306	Computational Fluid Dynamics	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	3	-	-	11	6	3	1
Cumulative Sum	6	24	19	65	12	6	3

  
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CSE ST-04/04

Teaching and Evaluation Scheme

B. Tech: VII Semester

CourseCode	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for Passing	Max.	Min. for Passing
1CSOE4**	Open Elective-III	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CSHS403	Project Management	2	0	0	2	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CSPC404	Information and Network Security	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CSPC405	Distributed and Cloud Computing	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CSPE4**	Professional Elective- V	3	0	0	3	ISE I	10	40	--	--
						MSE	30		--	--
						ISE II	10		--	--
						ESE	50		--	--
1CSPC451	Information and Network Security Laboratory	0	0	2	1	ISE	--		50	20
1CSPC452	Distributed and Cloud Computing Laboratory	0	0	2	1	ISE	--		50	20
						ESE	POE		50	20
1CSPE4**	Professional Elective- V Lab	0	0	2	1	ISE	--		50	20
						ESE	POE		50	20
1CSPR456	Project Phase I	0	0	4	4	ISE	--		50	20
						ESE	POE		50	20
Total		14	0	10	21		500		350	
Total Contact Hours/ Week: 24Hrs										

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<b>Professional Elective- V</b> 1. Artificial Intelligence - 06 2. Network Administration -07 3. High Performance Computing -08	<b>Professional Elective Laboratory- V</b> 4. Artificial Intelligence - 53 5. Network Administration -54 6. High Performance Computing -55
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**Open Elective- III**

Course Code	Course Name	Course Offered by
1ME0E105	Reliability Engineering	Mechanical Engineering
1ME0E106	Vibration Measurement & Analysis	
1CSOE401	Computer Vision	Computer Science and Engineering
1CSOE402	Machine Learning	
1EE0E401	Electric and Hybrid Vehicles	Electrical Engineering
1EE0E402	Wind and Solar Energy Systems	
1CVOE401	Structural Auditing	Civil Engineering
1CVOE402	Disaster Management	
1AUOE401	Vehicle maintenance and safety	Automobile Engineering
1AUOE402	Vehicle Aerodynamics	
1AEOE105	Helicopter Engineering	Aeronautical Engineering
1AEOE106	Composite Structure Fabrication	

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	2	-	-	8	4	3	4
Cumulative Sum	8	24	19	73	16	9	7



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CSST-11/13

Teaching and Evaluation Scheme

B. Tech Semester VIII

Course Code	Course	Teaching Scheme				Evaluation Scheme				
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks	
							Max.	Min. for Passing	Max.	Min. for Passing
1CSPE4**	Professional Elective- VI *	3	0	0	3	ISE I	10	40	--	
						MSE	30		--	
						ISE II	10		--	
						ESE	50	20	--	
1CSPR457	Internship / ProjectPhase II	0	0	27#	8	ISE	--	50	20	
						ESE	POE	50	20	
1CSPR458	Socio Outreach	0	0	0	1	ISE	-	50	20	
Total		3	0	0	12		100		150	
Total Contact Hours/ Week: 30										

##Students shall opt for an industry internship (including project work) or in-house project work. Contact hours for industry internship candidates shall be as per industry norms. Students opting for in-house project work shall have contact hours 27 hrs./ week for project work.

\*List of courses shall be announced at start of semester. Students opting for industry internship shall be applicable for blended teaching scheme (Flipped Classroom).

Professional Elective- VI

1. MOOC Course-1
2. MOOC Course-2
3. MOOC Course-3

Course Category	HS	BS	ES	PC	PE	OE	PR
Credits	-	-	-	-	3	-	9
Cumulative Sum	8	24	19	73	19	9	16

  
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Total Credit Category Wise/ Semester Wise

Sem	HS	BS	ES	PC	PE	OE	PR	Total
I	3	9	9					21
II		7	10	3				20
III		4		18				22
IV		4		19				23
V				14	6	3	2	25
VI	3			11	6	3	1	24
VII	2			8	4	3	4	21
VIII					3		9	12
Total	8	24	19	73	19	9	16	168
%	4.76	14.29	11.31	43.45	11.31	5.36	9.52	100
AICTE	12	25	24	48	18	18	15	160

  
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**Teaching and Evaluation Scheme**  
**T.Y.B. Tech: Semester-V**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for Passing	Max.	Min. for Passing	
0OE****	Open Elective-I	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC301	Nutrition	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC302	Processing of Fruits and Vegetables	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC303	Processing of Milk & Milk Products	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC304	Food Additives & Ingredients	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPE****	Professional Elective-I	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC351	Nutrition Laboratory	--	--	2	1	ISE	--	--	25	10	
0FTPC352	Processing of Fruits and Vegetables Laboratory	--	--	2	1	ESE	--	POE	25	10	
0FTPC353	Processing of Milk & Milk Products Laboratory	--	--	2	1	ISE	--	--	25	10	
0FTPC354	Food Additives & Ingredients Laboratory	--	--	2	1	ESE	--	OE	25	10	
Total		18	0	08	22	Total	600		200		
Total Contact Hours/Week: 26 hrs											
Course Category		HS	BS	ES	PC	PE	OE	PR			
Credits		00	00	00	16	03	03	00			
Cumulative Sum		04	29	28	39	03	03	02			
0FTPE3** Professional Elective-I											
0FTPE305- Wine Technology			0FTPE306- Sugar Technology								
0OE*** Open Elective-I											
0FTOE311 – Packaging Technology											

  
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FT-ST-05/08



**Teaching and Evaluation Scheme**  
**T.Y.B. Tech: Semester-VI**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for Passing	Max.	Min. for Passing	
0OE****	Open Elective-II	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC308	Processing of Cereals, Pulses & Oilseeds	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC309	Processing of Meat, Fish & Poultry Products	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC310	Bakery and Confectionary	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPE****	Professional Elective-II	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC355	Processing of Cereals, Pulses & Oilseeds Laboratory	--	--	2	1	ISE	--	--	25	10	
0FTPC356	Processing of Meat, Fish & Poultry Products Laboratory	--	--	2	1	ESE	--	POE	25	10	
0FTPC357	Bakery and Confectionary Laboratory	--	--	2	1	ISE	--	--	25	10	
0FTPR361	Minor Project	--	--	2	1	ESE	--	OE	25	10	
0FTPR362	In-Plant Training	--	--	--	1	ISE	--	--	25	10	
						ESE	--	OE	25	10	
						ISE	--	PR	25	10	
						ESE	--	--	--	--	
						ISE	--	--	--	--	
						ESE	--	PR	--	--	
Total		15	--	08	20	Total	500		200		
Total Contact Hours/Week: 23 hrs											
Course Category		HS	BS		ES	PC	PE	OE	PR		
Credits		00	00		00	12	03	03	02		
Cumulative Sum		04	29		28	51	06	06	04		
0FTPE3** Professional Elective-II											
0FTPE311- Fragrance Technology			0FTPE312- Nutraceuticals								
0OE*** Open Elective-II											
0FTOE321 – Process Modeling and Simulation											

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FT-ST-06/08

**Teaching and Evaluation Scheme**  
**B. Tech: Semester-VII**

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)		
							Max.	Min. for Passing	Max.	Min. for Passing	
0OE***	Open Elective-III	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC401	Food Biotechnology	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC402	Food Hygiene and Sanitation	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC403	Process Instrumentation & Control	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPE***	Professional Elective-III	3	--	--	3	ISE I	10	40	--	--	
						MSE	30		--	--	
						ISE II	10		--	--	
						ESE	50		20	--	--
0FTPC451	Food Biotechnology Laboratory	--	--	2	1	ISE	--	--	25	10	
						ESE	--	POE	25	10	
0FTPC452	Process Instrumentation & Control Laboratory	--	--	2	1	ISE	--	--	25	10	
						ESE	--	POE	25	10	
0FTPE***	Professional Elective-III Laboratory	--	--	2	1	ISE	--	--	25	10	
						ESE	--	OE	25	10	
1MEPR456	Project (Phase-I)	--	--	4	2	ISE	--	--	50	20	
						ESE	--	PR	50	20	
Total		15	--	10	20	Total	500		250		
Total Contact Hours/Week: 25 hrs											
Course Category		HS	BS		ES	PC	PE	OE		PR	
Credits		00	00		00	11	04	03		02	
Cumulative Sum		04	29		28	62	10	09		06	
0FTPE*** Professional Elective-III											
0FTPE404- Biochemical Engineering			0FTPE405- Wealth from Waste								
0FTPE*** Professional Elective-III Laboratory											
0FTPE453- Biochemical Engineering			0FTPE454- Wealth from Waste								
0OE***- Open Elective-III											
0FTOE411 – Process Optimization and Automation			0FTOE412- Cold Storage and Supply Chain Management								

Head of Department

Dean Academics

Director

Executive Director



FT-ST-07/08



**Teaching and Evaluation Scheme**  
**B. Tech : Semester-VIII**

Course Code	Course	Teaching Scheme				Evaluation Scheme							
		L	T	P	Credits	Scheme	Theory (Marks)		Practical (Marks)				
							Max.	Min. for Passing	Max.	Min. for Passing			
0FTPC407	Food Quality and Assurance	3	--	--	3	ISE I	10	20	40	--	--		
0FTPC408	Process Equipment Design	3	--	--	3	MSE	30			20	40	--	--
						ISE II	10					--	--
						ESE	50					--	--
						ISE I	10	20	40			--	--
MSE	30	--	--										
ISE II	30	--	--										
ESE	50	--	--										
0FTPC409	Project Economics	3	--	--	3	ISE I	10	20	40	--	--		
						MSE	30			--	--		
						ISE II	10			--	--		
						ESE	50			--	--		
0FTPE****	Professional Elective-IV	3	--	--	3	ISE I	10	20	40	--	--		
0FTPC457	Process Equipment Design Laboratory	--	--	2	1	MSE	30			--	--		
						ISE II	10			--	--		
						ESE	50			--	--		
						ISE I	10	--	--				
0FTPE***	Professional Elective-IV Laboratory	--	--	2	1	ISE	--	--	POE	25	10		
0FTPR461	Project (Phase-II)	--	--	10	5	ISE	--	--	OE	25	10		
						ESE	--	--	PR	50	20		
						ISE	--	--	PR	100	40		
						ESE	--	--	PR	100	40		
Total		12	0	14	19	Total	400			250			
Total Contact Hours/Week: 26 hrs													
Course Category		HS	BS		ES	PC	PE	OE		PR			
Credits		00	00		00	10	04	00		05			
Cumulative Sum		04	29		28	72	14	09		11			
Credits (AICTE)													
0FTPE*** Professional Elective-IV													
0FTPE410- Design and Development of Special Foods					0FTPE411- Food Allergies								
0FTPE*** Professional Elective-IV Laboratory													
0FTPE458- Design and Development of Special Foods					0FTPE459- Food Allergies								

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FT-ST-08/08