BVB's

SARDAR PATEL COLLEGE OF ENGINEERING, MUMBAI

Final Year B. Tech. Electrical Engineering

Academic Course Credit System and Evaluation Scheme

(REGULATION 2022)

Academic Year 2025-26

Courses Offered for Final Year B.Tech. in Electrical Engineering (Semester VII)
Applicable for the students entering in First Year in Academic Year 2022-23 (Applicable from 2025-26) R 22

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			SL Hr / Sem	Credits	In semester Evaluation (Points)			End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
			L	P	T			Mid term points	time (Hrs)	IE	Points	Time (Hrs)			
Professional Elective Course															
1	#Professional Elective - IV	PE-BTE7xx	3	0	1	64	4	30	1.5	10	100	3	60%	25	125
2	#Professional Elective - V	PE-BTE7xx	3	0	1	64	4	30	1.5	10	100	3	60%	25	125
3	#Professional Elective - VI	PE-BTE7xx	3	0	1	64	4	30	1.5	10	100	3	60%	25	125
Open Elective Course															
4	#Open Elective - II	OE-BTx7xx	3	0	0	48	3	30	1.5	10	100	3	60%		100
Project Course															
5	Project Stage II	PR-BTE701	$2 + 10^{\$}$				4	One In Sem Evaluation. and one End Sem. Evaluation (Ref Academic Rules)							200
Online Courses															
6	#Online Course	OL-BTExxx													
Value Added Courses															
7	#Value Added Tech./Non-Tech.	VA-BTExxx, VA-BTxxx VN-BTxxx						Courses offered by Department / CCE							
	TOTAL						**19**								**675**

IE: Internal Evaluation
#List of courses will be announced at the beginning of the academic year.
$Number of hours students need to work

List of Professional Elective PE-IV

1) PE-BTE701 Advanced Electric Drives
2) PE-BTE702 Computer Aided Power System Analysis
3) PE-BTE703 Smart Grid
4) PE-BTE704 Industrial Automation

List of Professional Elective PE-V

1) PE-BTE711 Vehicular systems and control of EV drives
2) PE-BTE712 Restructuring and Deregulation of Power System
3) PE-BTE713 Power Quality and FACTS
4) PE-BTE714 Advanced Techniques in Power System Protection
5) PE-BTE715 Non-linear control system

List of Professional Elective PE-VI

1) PE-BTE721 Energy storage and Vehicle Management System
2) PE-BTE722 Modelling and Analysis of Electrical Machine
3) PE-BTE723 High Voltage Engineering
4) PE-BTE724 Embedded System

List of Open Elective OE-II

1) OE-BTE701 Image Processing
2) OE-BTE702 Artificial Intelligence
3) OE-BTE703 Medical Electronics
4) OE-BTE704 Engineering Economics
5) OE-BTE705 Internet of Things

Additional Open Elective Courses available: Refer open elective courses offered by the Civil and Mechanical Engineering Department of SPCE

List of Value added courses

Sr No.	Name of the course	Course code
1	Finite Element Methods for Electrical Engineering	VA-BTE005
2	Numerical Methods for Engineers	VA-BTE006
3	Sensors and smart meters	VA-BTE007
4	Cables and Cable Management Systems	VA-BTE008
5	ETAP and WAMS	VA-BTE009
6	Solar PV Installation	VA-BTE010
7	Motor starters and drives operation and maintenance	VA-BTE011

Courses Offered for Final Year B.Tech. in Electrical Engineering (Semester VIII) Applicable for the students entering in First Year in Academic Year 2022-23 (Applicable from 2025-26) R 22														
Sr. No.	**Course Name**	**Code**	**Course Plan per Week (Hrs)**			**SL Hr/ Sem**	**Credits**	**In semester Evaluation (Points)**			**End Semester Evaluation (Points)**		**End semester weightage (%)**	**Total Points**
			L	**P**	**T**			**Mid-Term points**	**Mid Term Hrs**	**IE points**	**Points**	**Time (Hrs)**		
Open Elective Course														
1	Open Elective III Offered in online mode through SWAYAM/ NPTEL[#] or Institute	OE-BTX8xx	3	--	--	48	3	30	1.5	10	100	3	60%	100
Internship														
2	External / Internal Internship	PR-BTE801					~~9~~	100 points			200 points			300
	TOTAL						**12**							**400**

#Refer Academic rules for detail.

List of Open Elective OE-III

1) OE-BTE801 Computer Network

List of Professional Electives Tracks

Professional Elective-I	Professional Elective-II	Professional Elective-III	Professional Elective-IV	Professional Elective-V	Professional Elective-VI
Sem V	**Sem VI**	**Sem VI**	**Sem VII**	**Sem VII**	**Sem VII**
ELECTRIC VEHICLES & POWER ELECTRONICS TRACK					
Design of Power Electronics converters PE-BTE501	Renewable Energy Sources PE-BTE601	Basics of Automotive Systems PE-BTE611	Advanced Electric Drives PE-BTE701	Vehicular systems and control of EV drives PE-BTE711	Energy storage and Vehicle Management System PE-BTE721
POWER SYSTEM & POWER ELECTRONICS TRACK					
Sensors and Actuators PE-BTE502	Design and Management of Electrical Systems PE-BTE602	Micro-grid and Distributed generation BTE612	Computer Aided Power System Analysis PE-BTE702	Restructuring and Deregulation of Power System PE-BTE712	Modelling and Analysis of Electrical Machine PE-BTE722
	Electrical Machine Design PE-BTE603		Smart Grid PE-BTE703	Power Quality and FACTS PE-BTE713	High Voltage Engineering PE-BTE723
				Advanced Techniques in Power System Protection PE-BTE714	
CONTROL SYSTEM TRACK					
Digital Signal Processing PE-BTE503	Control System Design PE-BTE604	Digital Control Design BTE613	Industrial Automation PE-BTE704	Non-linear control system PE-BTE715	Embedded System PE-BTE724

NOTES (R22):

1. The Evaluation of any course shall be such that all Course Outcomes are uniformly mapped and as per the scheme.
2. **Assessment criteria** for laboratory/Tutorial work. i.e., weightage for assessment shall be as follows: i) Attendance in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report=40%.
3. **Internal Evaluation (IE)** will be carried out by the course instructor for 10 points. It is the continuous evaluation throughout the semester. The evaluation will be based on minimum three of the following activities decided by course instructor. The maximum points that can be assigned to one activity will be 04. The course instructor needs to inform the students and head of the department about the activities those will be considered for IE and the points assigned to them in first week of semester. The course instructor will submit the internal evaluation points (out of 10 with activity wise break up) to examination section before the beginning of End Semester examination. List of Activities: 1. Class Involvement 2. Assignments 3. Problem Solving 4. Mini project 5. Quizzes 6. Presentation 7. Oral.
4. Student can opt for an online course available on https://swayam.gov.in/ or https://onlinecourses.nptel.ac.in/ subject to approval from the department. After successful completion of the course, the course title can appear on the grade card of student.
5. The Mandatory courses are with Pass (P) and No Pass (NP) grades.
6. Department will offer Value Added courses in a semester, subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon completion of the Value-Added course, the course title shall appear in the grade card of the student.
7. Students can optionally opt for Non-Technical Value-Added courses offered by Centre for Continuing Education (CCE-SPCE). Upon successful completion of the course, the course title shall appear on the grade card of the student.
8. The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP.
9. For Open Elective course II, students with C.P.I. higher than 8.5, can opt for an online course (approved by the department) offered through SWAYAM or NPTEL portal instead of elective courses offered by department/institute. Upon successful completion of the course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation.
10. For Project Course: Contact hours =2 and self-learning hours will be as per student's choice; It will have in-semester evaluation which shall include one or more in-semester presentations. 10 points for report and 10 points for presentation and viva voce examined by supervisor and one internal examiner.
11. The evaluation of the courses offered by department through SWAYAM/ NPTEL platform shall be carried out by department or the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation.
12. Internship Evaluation shall be as per Academic Rules.

Note: Refer Academic and Examination rules and regulations for further details.

Table GATE-MAP: Alignment of Course Content with GATE Syllabus

B.Tech. in Electrical Engineering

Sr. No.	Topics from GATE Syllabus	Related Core Courses in Electrical Engineering. Semester
1	Section 1 Engineering Mathematics	Differential Calculus & Complex Numbers, Integral Calculus & Differential Equations Laplace Transform, Vector calculus & Linear Algebra Transforms, Statistics and Probability
2	Section 2 Electric Circuits	Electrical Networks
3	Section 3 Electromagnetic Fields	Electromagnetic Fields and Waves
4	Section 4 Signals and Systems	Signals and Systems
5	Section 5 Electrical Machines	Electrical Machines I and II
6	Section 6 Power Systems	Power Generation, Transmission and Distribution Power System Analysis Power System Operation and Control
7	Section 7 Control Systems	Control System
8	Section 8 Electrical and Electronic Measurements	Measurements & Instrumentation
9	Section 9 Analog and Digital Electronics	Electronic Circuits, Digital Electronics, Communication Engineering
10	Section 10 Power Electronics	Power Electronics