

### **Metric 1.3.2-**

**Number of certificate/value added courses/Diploma Programmes offered by the institutions and online courses of MOOCs, SWAYAM/e-PG Pathshala/NPTEL and other recognized platforms (without repeat count) where the students of the institution have enrolled and successfully completed during the last five years.**

### **Findings of DVV-**

List of value added courses which are optional and offered outside the curriculum of the programs signed by appropriate authority. Brochure and Course content or syllabus along with course outcome of Value added courses offered. In case if documents are in regional language please provide translated copy in English. Google drive links are not accepted.

### **Response of HEI-**

- 1) List of value added courses which are optional and offered outside the curriculum of the programs signed by the Principal is attached. **(Appendix-I)**
- 2) Brochure and Course content or syllabus along with course outcome of Value added courses offered are attached. **(Appendix-II)**

# Appendix-I



अमृतं तु विद्या

# Bharatiya Vidya Bhavan's Sardar Patel College of Engineering

(Government-Aided Autonomous Institute)

MUNSHI NAGAR, ANDHERI (WEST), MUMBAI - 400 058.



Tel : 91-22-2623 2192  
91-22-2628 9777  
Fax : 91-22-2623 7819

E-mail : principal@spce.ac.in  
Web : www.spce.ac.in

Date:- 18/07/2024

## Number of certificate/value added courses/Diploma Programmes offered

### Academic Year 2018-19

Name of the course/programme	Course Code
Indian Traditional Knowledge	MC-BT002
Stress Management by Yoga	THAU4/MDAU4
SOFT COMPUTING 1	VLBTE 01
NUMERICAL TECHNOLOGIES	VLBTE 04
SOFT COMPUTING 2	VLBTE 06
SOFT COMPUTING 1	VABTE 01
Energy science and engineering	VC-BTC-326
Life science	VC-BTC-327
Introduction to civil engineering	VC-BTC-328
Economics for engineers	VC-BTC-329
Sociology and elements of India history for engineers	VC-BTC-330
Life science (LAB)	VC-BTC-331
Disaster Preparedness and planning	VA-BTS-426
Civil engineering-societal & global impact	VA-BTS-427
Management-I(organizational behaviour)	VA-BTS-428
Rural technology & community development	VA-BTS-429
Developing soft skills and personality	VA-BTS-430
Development engineering	VA-BTS-431
Development engineering (LAB)	VA-BTS-456
Introduction to offshore engineering	VA-BTS-526
Legal Aspects in construction	VA-BTS-527
Computational techniques	VA-BTS-528
Quantitative techniques and its applications in civil engineering	VA-BTS-528
Geographic Information System (GIS) and its application	VA-BTS-626
Analysis of offshore structure	VA-BTS-627
Finite element analysis	VA-BTS-628
Photogrammetry & GPS	VA-BTS-629
Geographic Information System (GIS) and its application	VC-BTC-776
Environmental Impact Assessment and Management	VC-BTC-777
Conventional and Non-Conventional Materials in highway subgrade	VC-BTC-778
Land use planning and natural resource management	VC-BTC-779
Geographic Information System (GIS) and its application	VC-BTC-876
Environmental Impact Assessment and Management	VC-BTC-877



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## Academic Year 2019-20

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Indian Traditional Knowledge	MC-BT002
Stress Management by Yoga	THAU4/MDAU4
SOFT COMPUTING 1	VLBTE 01
NUMERICAL TECHNOLOGIES	VLBTE 04
SOFT COMPUTING 2	VLBTE 06
SOFT COMPUTING 1	VABTE 01
Energy science and engineering	VC-BTC-326
Life science	VC-BTC-327
Introduction to civil engineering	VC-BTC-328
Economics for engineers	VC-BTC-329
Sociology and elements of India history for engineers	VC-BTC-330
Life science (LAB)	VC-BTC-331
Disaster Preparedness and planning	VA-BTS-426
Civil engineering-societal & global impact	VA-BTS-427
Management-I(organizational behaviour)	VA-BTS-428
Rural technology & community development	VA-BTS-429
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## Academic Year 2020-21

Name of the course/programme	Course Code
Indian Traditional Knowledge	MC-BT002
Stress Management by Yoga	THAU4/MDAU4
SOFT COMPUTING 1	VLBTE 01
NUMERICAL TECHNOLOGIES	VLBTE 04
SOFT COMPUTING 2	VLBTE 06
SOFT COMPUTING 1	VABTE 01
Energy science and engineering	VC-BTC-326
Life science	VC-BTC-327
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Sociology and elements of India history for engineers	VC-BTC-330
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Civil engineering-societal & global impact	VA-BTS-427
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## Academic Year 2021-22

Name of the course/programme	Course Code
Indian Traditional Knowledge	MC-BT002
Stress Management by Yoga	THAU4/MDAU4
SOFT COMPUTING 1	VLBTE 01
NUMERICAL TECHNOLOGIES	VLBTE 04
SOFT COMPUTING 2	VLBTE 06
SOFT COMPUTING 1	VABTE 01
Energy science and engineering	VC-BTC-326
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## Academic Year 2022-23

Name of the course/programme	Course Code
Indian Traditional Knowledge	MC-BT002
Stress Management by Yoga	THAU4/MDAU4
SOFT COMPUTING 1	VLBTE 01
NUMERICAL TECHNOLOGIES	VLBTE 04
SOFT COMPUTING 2	VLBTE 06
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*[Signature]*

I/c. Principal

Bharatiya Vidya Bhavan's  
Sardar Patel College of Engineering  
(Government Aided Autonomous Institute)  
Munshi Nagar, Andheri (W), Mumbai - 58.

# **Appendix-II**



**Sardar Patel College of Engineering, Andheri (West), Mumbai 400 058**

**Final Year B.Tech. in Mechanical Engineering**  
**Course Credit System**  
**Academic Year 2019-20**

**NOTES:**

(1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details.

(2) Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: (i) Attendance in Laboratory/Tutorial = 20%, (ii) Journal/Drawing sheet/Sketch book = 40%, (iii) MCQ/Oral/Test = 40%.

(3) Laboratory course is considered as a separate head of passing.

(4) The Mandatory courses are with Pass (P) and No Pass (NP) grades and offered institute wide, may be available in both semesters of year and must be passed before obtaining degree.

(5) Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of the student.

- (6) Department will offer the Value Added courses in a semester subject to availability of resources and enrollment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grades of the courses will appear in the grade card of the student.
- (7) List of Professional Elective Courses being offered by department in a semester will be selected from Table PEC-TYBTECH for T.Y.B.Tech. and Table PEC-BTECH for final year B.Tech. and the list of elective courses being offered by department will be displayed at the beginning of semester.
- (8) List of Open Elective Courses being offered by institute in a semester will be selected from Table OEC-TYBTECH for T.Y.B.Tech. and Table OEC-BTECH for final year B.Tech. and the list of elective courses being offered by institute will be displayed at the beginning of semester.
- (9) For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing an online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing the elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation.
- (10) Semester VII: \$ For Project course: contact hours = 2 and self-learning hours = 6 ; @ For project course, in-semester evaluation shall include one or more in-semester presentations. (\*) 15 points for report and 15 points for presentation and viva voce examined by supervisor and one internal examiner.  
Semester VIII: \$ For Project course: contact hours = 2 and self-learning hours = 12 ; @ For project course, in-semester evaluation shall include one or more in-semester presentations. (\*) 30 points for report and 30 points for presentation and viva voce examined by supervisor and one internal examiner.
- (11) 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. The term work for these courses shall include evaluations along the pattern of GATE examinations, for example, part of the term work shall consist of MCQ similar to GATE examinations.
- (12) The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
- (13) One of the Course Outcome (CO), wherever applicable, shall include attainment of one of the essential skillsets: leadership skills, entrepreneurship skills, managerial skills, communication skills, collaborative skills.
- (14) Students can optionally opt for Value Added Non Technical courses offered by Center for Continuing Education (CCE-SPCE). These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card. The list of courses is given in Table-VNT
- (15) L- Lecture, P- Laboratory, T-Tutorial.

**Sardar Patel College of Engineering**  
**Academic Year 2019-20**  
**Courses Offered for Final Year B.Tech. in Mechanical Engineering (Semester VII)**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/P ractical (Note 2)	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Core Courses													
1	Design of Machines and Mechanical Systems	PC-BTM711	3	0	1	4	20	20	100	3	60%	25	125
2	Industrial Engineering and Project Management	PC-BTM714	3	0	1	4	20	20	100	3	60%	25	125
Professional Elective Course - III (Note 7)													
3	Professional Elective Course - III	PE-BTM7xx	Refer Table PEC-BTECH			4	Refer Table PEC-BTECH						
Open Elective Course - II (Note 8,9)													
4	Open Elective Course - II	OE-BTM7xx	Refer Table OEC-BTECH			3	Refer Table OEC-BTECH						
Project Course (Note 10)													
5	Project Stage I	PR-BTM798	0	2+6\$	0	4	@	@	-	-	-	50*	50
Online Courses (Note 5)													
6	Online Course	OL-BTM78x	0	0	0	0	0	0	0	0	0	0	0
Value Added Courses (Note 6)													
7	Cloud Computing	VA-BTM791	2	0	1	0	20	20	100	3	60%	25	125
Value Added Non-Technical Courses (Note14)													
8	Refer Table-VNT	VN-BTxxx	Refer Table-VNT										
	<b>TOTAL</b>					<b>19</b>							

**Sardar Patel College of Engineering**  
**Academic Year 2019-20**  
**Courses Offered for Final Year B.Tech. in Mechanical Engineering (Semester VIII)**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical (Note 2)	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Core Courses (# Only for students graduating in AY2019-20)													
1	CAD/CAM/CIM	PC-BTM606(#)	2	0	0	2(#)	20	20	100	3	60%	0	100
Laboratory Courses (Note 3)(#Only for students graduating in AY2019-20)													
2	CAD/CAM/CIM Laboratory	PC-BTM656(#)	0	2	0	1(#)	0	0	0	0	0	50	50
Professional Elective Course - IV, V (Note 7)													
3	Professional Elective Course - IV	PE-BTM7xx	Refer Table PEC-BTECH			4	Refer Table PEC-BTECH						
4	Professional Elective Course - V	PE-BTM7xx	Refer Table PEC-BTECH			4	Refer Table PEC-BTECH						
Open Elective Course - III (Note 8,9)													
5	Open Elective Course - III	OE-BTM7xx	Refer Table OEC-BTECH			3	Refer Table OEC-BTECH						
Project Course (Note 10)													
6	Project Stage II	PR-BTM898	0	2+12\$	0	7	@	@	-	-	-	100*	100
Online Courses (Note 5)													
7	Online Course	OL-BTM88x	0	0	0	0	0	0	0	0	0	0	0
Value Added Courses (Note 6)													
8	Big Data Analytics	VA-BTM891	2	0	1	0	20	20	100	3	60%	25	125
Value Added Non-Technical Courses (Note14)													
9	Refer Table-VNT	VN-BTxxx	Refer Table-VNT										
	<b>TOTAL</b>					<b>18+3#</b>							

Note #: PC-BTM606 and PC-BTM656 will be offered only to students graduating in AY2019-20.

**Sardar Patel College of Engineering**

**Academic Year 2019-20**

**TABLE PEC-BTECH: Professional Elective Courses - III, IV and V for Final Year B.Tech. in Mechanical Engineering (Semester VII and VIII)**

Sr. No.	Course Name	Specialization	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
				L	P	T		T-I	T-II	Points	Time (Hrs)			
Professional Elective Courses I and II														
1	Process Eqpt. Design and Piping Engg.	D	PE-BTM711	3	0	1	4	20	20	100	3	60%	25	125
2	Design for Manufacturing and Assembly	D	PE-BTM712	3	0	1	4	20	20	100	3	60%	25	125
3	Introduction to Design of Power Transmission	D	PE-BTM713	3	0	1	4	20	20	100	3	60%	25	125
4	Electric Vehicle Design and Development	D	PE-BTM714	3	0	1	4	20	20	100	3	60%	25	125
5	Introduction to Fracture Mechanics	D	PE-BTM715	3	0	1	4	20	20	100	3	60%	25	125
6	Design of Material Handling Equipment	D	PE-BTM716	3	0	1	4	20	20	100	3	60%	25	125
7	Compliant Mechanisms	D	PE-BTM717	3	0	1	4	20	20	100	3	60%	25	125
8	Business Process Re-engineering and TQM	M	PE-BTM731	3	0	1	4	20	20	100	3	60%	25	125
9	Customer Relationship Management (CRM)	M	PE-BTM732	3	0	1	4	20	20	100	3	60%	25	125
10	Industrial Robotics	M	PE-BTM733	3	0	1	4	20	20	100	3	60%	25	125
11	Supply Chain Management	M	PE-BTM734	3	0	1	4	20	20	100	3	60%	25	150
12	Welding Process and Welding Technology	M	PE-BTM735	3	0	1	4	20	20	100	3	60%	25	125
13	Advanced IC Engine	T	PE-BTM751	3	0	1	4	20	20	100	3	60%	25	125
14	Computational Fluid Dynamics	T	PE-BTM752	3	0	1	4	20	20	100	3	60%	25	125
15	Introduction to Cryogenics	T	PE-BTM753	3	0	1	4	20	20	100	3	60%	25	125
16	Power Plant Engineering	T	PE-BTM754	3	0	1	4	20	20	100	3	60%	25	125
17	Automobile Engineering	T	PE-BTM755	3	0	1	4	20	20	100	3	60%	25	125
18	Renewable Energy Sources and Utilization	T	PE-BTM756	3	0	1	4	20	20	100	3	60%	25	125

**Note:** Specializations are: D - Design, M - Manufacturing, T - Thermal Engineering

Refer to Table PEC-TYBTECH for additional professional elective courses available to final year B.Tech. students, if any.

**Sardar Patel College of Engineering**

**Academic Year 2019-20**

**TABLE OEC-BTECH: Open Elective Courses - II and III for Final Year B.Tech. in Mechanical Engineering (Semester VII and VIII)**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/P ractical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Open Elective Courses - II and III													
1	Entreprise Resource Planning (ERP)	OE-BTM711	3	0	0	3	20	20	100	3	60%	0	100
2	Intro. to Research Methodology	OE-BTM712	3	0	0	3	20	20	100	3	60%	0	100
3	Introduction to MEMS	OE-BTM714	2	0	1	3	20	20	100	3	60%	25	125
4	Solar and Wind Technology	OE-BTM715	2	0	1	3	20	20	100	3	60%	25	125
5	<i>Internet of Things (IOT) (*)</i>	<i>OE-BTM716</i>	2	0	1	3	20	20	100	3	60%	25	125
6	<i>Introduction to Augmented Reality (*)</i>	<i>OE-BTM717</i>	2	0	1	3	20	20	100	3	60%	25	125
7	<i>Fundamentals of AI and Machine Learning (*)</i>	<i>OE-BTM718</i>	2	0	1	3	20	20	100	3	60%	25	125
8	Value Engineering	OE-BTM719	2	0	1	3	20	20	100	3	60%	25	125
9	Fire and Safety Management in Industry	OE-BTM720	3	0	0	3	20	20	100	3	60%	0	100
10	Engineering Economics	OE-BTE702	3	0	0	3	20	20	100	3	60%	0	100
11	Internet of Things	OE-BTE704	3	0	0	3	20	20	100	3	60%	0	100
12	Robotics	OE-BTE801	3	0	0	3	20	20	100	3	60%	0	100
13	Power Plant Engineering	OE-BTE802	3	0	0	3	20	20	100	3	60%	0	100
14	Image Processing	OE-BTE805	3	0	0	3	20	20	100	3	60%	0	100
15	Online Course from SWAYAM/NPTEL (Note 9)	OE-BTS7Mx	0	0	0	3	0	0	100	0	100%	0	100

(\*) This course may be simultaneously offered to both T.Y.B.Tech. and Final Year B.Tech. students.

Refer to Table OEC-TYBTECH for additional open elective courses available to final year B.Tech. students, if any.



**Sardar Patel College of Engineering**

**Academic Year 2019-20**

**TABLE VNT: Value Added Non-Technical Courses for B.Tech. and M.Tech. Programmes**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/P ractical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Professional Elective Courses I and II													
1	UBUNTU	VN-BT001	Refer to Course Contents			0							Refer to Course Contents
2	Performing Arts and Script Writing	VN-BT002		0									
3	Financial Literacy	VN-BT003		0									
4	Self Defense Training	VN-BT004		0									
5	Yoga Health Technology for Self Management	VN-BT005		0									
6	Integrated Self Management	VN-BT006		0									
7	Photography	VN-BT007		0									

**Table GATE-MAP: Alignment of Course Content with GATE Syllabus (2019)**  
**B.Tech. in Mechanical Engineering**

No.	Section	Core courses in SPCE Curriculum 2019-20	Topics From GATE Syllabus (2019)
1	D	Machine Design	Machine Design
2	D	Design of Machines and Mech. Systems	Machine Design
3	D	Kinematics of Machinery	Theory of Machines
4	D	Dynamics of Machinery	Theory of Machines, Vibrations
5	D	Solid Mechanics	Mechanics of Materials
6	D	Strength of Materials	Mechanics of Materials
7	D	Computer Aided Machine Drawing	Machine Design
8	M	CAD/CAM/CIM	Computer Integrated Manufacturing
9	M	Mechanical Engineering Measurements	Metrology and Inspection
10	M	Manufacturing Science	Casting, Forming and Joining Processes; Machining and machine tool operations
11	M	Manufacturing Planning and Control	Production Planning and Control, Inventory Control, Operations Research
12	M	Mechatronics	Computer Integrated Manufacturing
13	M	Ind. Engg. And Proj./Fin. Mgmt.	Production Planning and Control, Operations Research
14	M	Material Science	Engineering materials
15	T	Thermal Systems	Applications of Fluid mechanics and Thermal sciences
16	T	Fluid Mechanics	Fluid Mechanics
17	T	Heat and Mass Transfer	Heat-Transfer
18	T	Refrigeration and Air-conditioning	Applications of Fluid mechanics and Thermal sciences
19	T	Thermodynamics	Thermodynamics
20	T	Internal Combustion Engine	Applications of Fluid mechanics and Thermal sciences
21	MATH	Applied Mathematics, I, II, III, IV	Linear Algebra, Calculus, Differential Equations, Complex variables, Probability and Statistics, Numerical Methods

**Note:**Sections are: D - Applied Mechanics and Design, M -Materials, Manufacturing and Industrial Engineering, T - Fluid Mechanics and Thermal Sciences, MATH - Engineering Mathematics

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Scheme for Final Year B.Tech.in Civil Engineering, (Semester - VII) Academic Year 2019-20**

Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
<b>Core Courses</b>													
1	Limit State Method For Reinforced Concrete Structures	PC-BTC701	3	0	1	4	20	20	100	3	60%	25#	125
2	Construction Engineering.	PC-BTC702	3	0	1	4	20	20	100	3	60%	25#	125
3	Water Resources Engineering	PC-BTC703	3	0	0	3	20	20	100	3	60%	0	100
4	Environmental Engineering -II	PC-BTC704	3	0	0	3	20	20	100	3	60%	0	100
5	Project-Stage I	PR-BTC705	0	(2+6) <sup>\$</sup>	0	4	0	0	0	0	0%	50###** (Note 9)	50
6	Professional Elective - I	PE-BTC711-728	3	0	1	4	20	20	100	3	60%	25#	125
<b>Laboratory Courses (Note 2&amp;3)</b>													
7	Environmental Engineering -II (Lab.)	PC-BTC751	0	2	0	1	0	0	0	0	0	25#	25
<b>Online Courses (Note 5)</b>													
8	Online Course	OL-BTCxxx	3	0	0	0	0	0	0	0	0	0	0
<b>Value Added Courses (Note 7)</b>													
9	Environmental Impact Assessment and Mgt.	VA-BTC772	2	0	0	AU	20	20	100	3	60%	0	100
10	Conventional and Nonconventional Materials in Highway Sub-grade	VA-BTC773	2	0	0	AU	20	20	100	3	60%	25#	125
<b>Value Added Non-Technical Courses (Note 12)</b>													
11	Non-technical value added course	VN-BTXXX	Refer Table-VNT										
	<b>TOTAL</b>		<b>18</b>	<b>2</b>	<b>3</b>	<b>23</b>							

**Non-technical value Added Courses-VNT**

VN-BT001: Ubuntu

VN-BT002: Performing Arts and Script Writing

VN-BT003: Financial Literacy

VN-BT004: Self Defence Training program

VN-BT005: Yoga health technology for self-management

VN-BT006: Integrated self-management

VN-BT007: Photography

**Elective Core – I**

<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>
1	PE-BTC711	Advanced Structural Analysis
3	PE-BTC 713	Applied Hydrology and Flood Control
5	PE-BTC 715	Geo informatics Technology
7	PE-BTC 717	Systems Approach in Civil Engineering
9	PE-BTC719	Structural Dynamics
11	PE-BTC721	Advanced Foundation Engineering
13	PE-BTC723	Pavement Design and Construction
15	PE-BTC725	Design of Prestressed Concrete Structures
17	PE-BTC727	Reinforced Concrete Repairs and Maintenance
18	PE-BTC728	Pavement Construction and Management

<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>
2	PE-BTC712	Advanced Computaional Techniques
4	PE-BTC714	Solid Waste Management
6	PE-BTC716	Advanced Repair and Rehabilitation of Structures
8	PE-BTC718	Risk and Value Management
10	PE-BTC720	Advanced Structural Mechanics
12	PE-BTC722	Ground Water Hydrology
14	PE-BTC724	Air Pollution
16	PE-BTC726	Traffic Engineering and Control

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Notes:**

1. Refer (i) Academic rules and regulations (ii) Examination rules and regulations for further details.
2. Laboratory course is considered as a separate head of passing
3. # 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
- 4.

A) For courses having **2 hours per week lecture / 5 modules:**

Sr. No.	Examination	Module
1	T – I	Module 1 & Part of Module 2
2	T – II	Part of Module 2 & Module 3
3	Final Examination	Module 1 to 5

B) For courses having **3 hours per week lecture / 7 modules:**

Sr. No.	Examination	Module
1	T – I	Module 1 ,2
2	T – II	Module 3, 4
3	Final Examination	Module 1 to 7

5. Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of the student.
6. The Mandatory courses are with Pass (P) and No Pass (NP) grades.
7. Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grade of the course will appear in the grade card of the student
8. List of Professional Elective Courses being offered by department in a semester will be selected from Table Elective Core I and the list of elective courses being offered by department will be displayed at the beginning of semester.
9. Semester VII: \$ For Project course: contact hours = 2 and self-learning hours = 6 ; For project course, in-semester evaluation shall include one or more in-semester presentations \*\*25 points for report and ## 25 points for presentation and viva voce examined by supervisor and one internal examiner
10. 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. The term work for these courses shall include evaluations along the pattern of GATE examinations, for example, part of the term work shall consist of MCQ similar to GATE examinations. GATE-MAP table is given at the end of final year B.Tech-Civil Engg. Credit System .
11. The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
12. Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE). These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.

Sardar Patel College of Engineering Andheri (West), Mumbai 400 058

Courses Offered for Final Year B.Tech. in Civil Engineering (Semester - VIII)  
Academic Year 2019-20

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
<b>Core Courses</b>													
1	Design and Drawing of Reinforced Concrete Structures	PC-BTC801	3	0	1	4	20	20	100	3	60%	25#	125
2	Quantity Survey, Estimation and Valuation	PC-BTC802	3	0	1	4	20	20	100	3	60%	25#	125
3	Construction Management	PC-BTC803	3	0	1	4	20	20	100	3	60%	25#	125
4	Project –Stage II*	PR-BTC804	0	(2+12) <sup>\$</sup>	0	7	0	0	0	0	0%	100###**(Note 9)	100
5	Entrepreneurship & Management	HSM-BTC805	2	0	0	2	20	20	100	3	60%	0	100
6	Professional Elective-II	PE-BTC811 TO PE-BTC826	3	0	1	4	20	20	100	3	60%	25#	125
<b>Online Courses (Note 5)</b>													
8	Online Course	OL-BTCxxx	3	0	0	0	0	0	0	0	0	0	0
<b>Value Added Courses (Note 7)</b>													
15	Low Cost Rural Roads	VA-BTC873	2	0	1	AU	20	20	100	3	60%	25#	125
<b>Value Added Non-Technical Courses (Note12)</b>													
18	Refer Table-VNT	VN-BTxxx	Refer Table-VNT										
	<b>TOTAL</b>		<b>14</b>	<b>0</b>	<b>4</b>	<b>25</b>							



**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Non-technical Value Added Courses-VNT**

- VN-BT001: Ubuntu
- VN-BT002: Performing Arts and Script Writing
- VN-BT003: Financial Literacy
- VN-BT004: Self Defence Training program
- VN-BT005: Yoga health technology for self-management
- VN-BT006: Integrated self-management
- VN-BT007: Photography

**Elective Core – II**

<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>	<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>
1	PE-BTC811	Industrial Waste Treatment	2	PE- BTC812	Earthquake Engineering
3	PE-BTC814	Water Resources Engineering and Management	4	PE-BTC815	Advanced Engineering Geology
5	PE-BTC816	Rock Mechanics	6	PE-BTC817	Geographic Information System
7	PE-BTC818	Environmental Impact Assessment & Audit	8	PE-BTC819	Appraisal and Implementation of Infrastructure Projects
9	PE-BTC820	Risk & Disaster Management	10	PE-BTC821	Advanced Design of Steel Structures
11	PE-BTC822	Soil Dynamics	12	PE-BTC823	Building Services
13	PE-BTC824	Design of Hydraulic Structures	14	PE-BTC825	Transportation Planning and Economics
15	PE-BTC826	Advanced Construction Engineering	16	PE-BTC827	Conventional and Nonconventional Materials in Highway Sub-grade

**Notes:**

1. Refer (i) Academic rules and regulations (ii) Examination rules and regulations for further details.
2. Laboratory course is considered as a separate head of passing
3. # 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
4. A) For courses having **2 hours per week lecture / 5 modules:**

Sr. No.	Examination	Module
1	T – I	Module 1 & Part of Module 2
2	T – II	Part of Module 2 & Module 3
3	Final Examination	Module 1 to 5

- B) For courses having **3 hours per week lecture / 7 modules:**

Sr. No.	Examination	Module
1	T – I	Module 1 ,2
2	T – II	Module 3, 4
3	Final Examination	Module 1 to 7

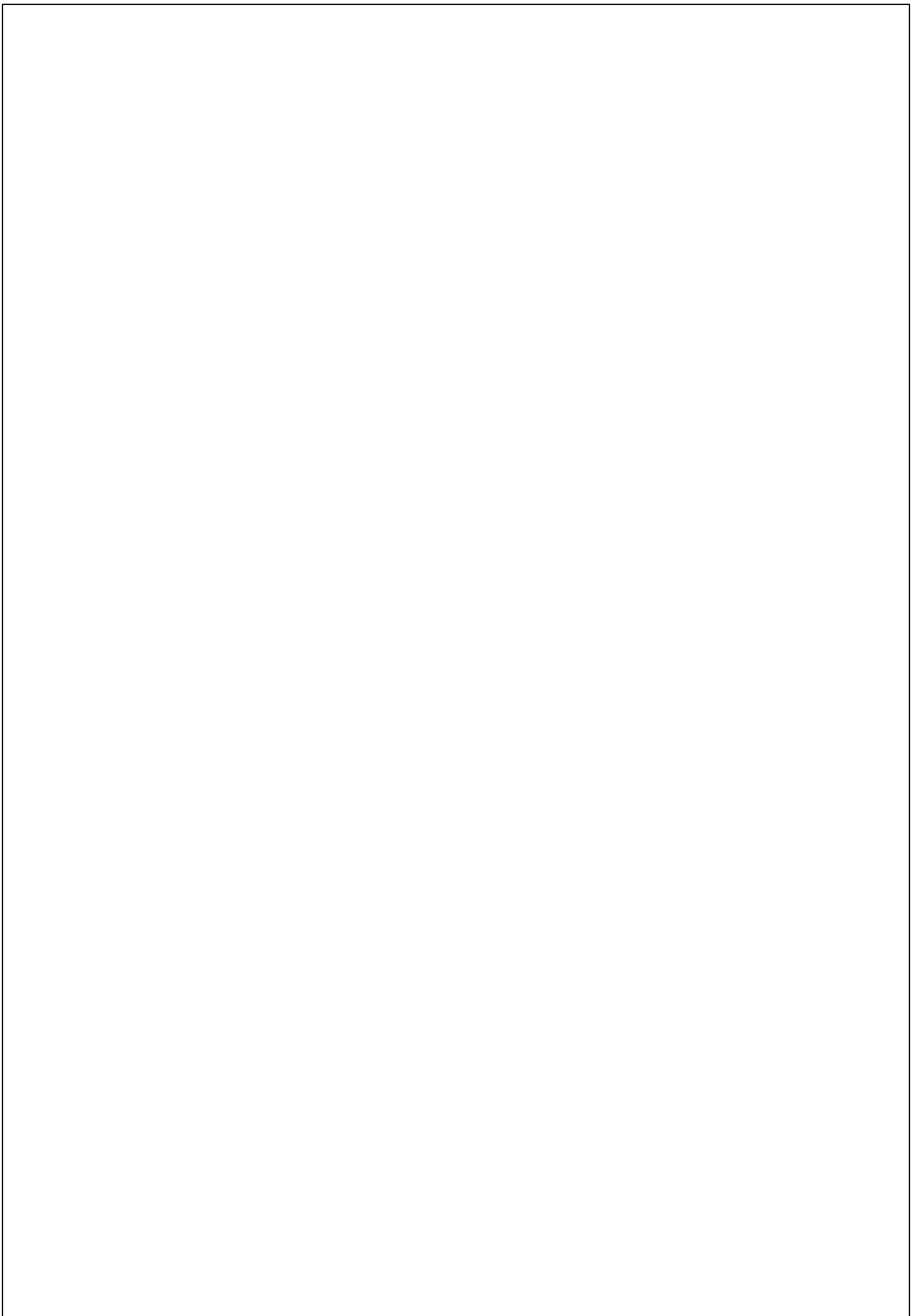
5. Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of the student.
6. The Mandatory courses are with Pass (P) and No Pass (NP) grades.
7. Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grade of the course will appear in the grade card of the student
8. List of Professional Elective Courses being offered by department in a semester will be selected from Table Elective Core I and the list of elective courses being offered by department will be displayed at the beginning of semester.
9. Semester VII: \$ For Project course: contact hours = 2 and self-learning hours = 12 ; For project course, in-semester evaluation shall include one or more in-semester presentations \*\*50 points for report and ## 50 points for presentation and viva voce examined by supervisor and one internal examiner.
10. 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. The term work for these courses shall include evaluations along the pattern of GATE examinations, for example, part of the term work shall consist of MCQ similar to GATE examinations. GATE-MAP table is given at the end of final year B.Tech-Civil Engg. Credit System .
11. The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
12. Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE). These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.

**Table GATE-MAP: Alignment of Course Content with GATE Syllabus (2019)**

**B.Tech. in Civil Engineering**

No.	Section	Core courses in SPCE Curriculum 2019-20	Topics From GATE Syllabus (2019)
1	S	Engg. Mechanics I- Engg. Mechanics II-	Engineering Mechanics
2	S	Mechanics of Materials	Solid Mechanics
3	S	Structural Mechanics	Structural Analysis
4	S	Structural Engineering	
5	S	Building Materials and Construction	Construction Materials and Management
6		Concrete Technology	
7		Construction Engineering & Management	
8		Quantity Survey, Estimation and Valuation	
9	S	Design of RCC Elements (Limit State Method)	Concrete Structures
10	S	Design and Drawing of Reinforced Concrete Structures	
11	S	Design of Steel Structures	Steel Structures
12	G	Soil Mechanics	Soil Mechanics
13	G	Foundation Engineering	Foundation Engg
14	W	Fluid Mechanics	Fluid Mechanics
15	W	Hydraulic Engineering	Hydraulics
16	W	Hydrology & Water Resources Engineering	Hydrology
17	W	Water Resources Engineering	Irrigation
18	E	Environmental Engineering-I	Water and Waste Water
19	E	Environmental Engineering-II	Air Pollution
20	E	Environmental Engineering-I & II	Municipal Solid Waste
21	E		Noise Pollution
22	T	Transportation Engineering	Transportation Infrastructure
23	T	Highway Engineering	Highway Pavements
24	T	Highway Engineering	Traffic Engineering
25	G	Basics of Surveying	Principles of surveying
26	G	Surveying & Geomatics	Photogrammetry
27	MATH	Applied Mathematics, I, II, III, IV	Linear Algebra, Calculus, Differential Equations, Complex variables, Probability and Statistics, Numerical Methods

**Note:**Sections are: S - Structural Engg, G-Geotechnical Engg, W-Water Resource Engg, E-Environmental Engg., T-Transportation Engg, G-Geomatics Engg., MATH - Engineering Mathematics



**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**BVB's Sardar Patel College of Engineering, Mumbai**

**Department of Electrical Engineering**

**Credit System**

**B.Tech in Electrical Engineering**

**Academic Year 2019-2020**

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Courses Offered for B.Tech. in Electrical Engineering (Semester VII)														
Academic Year 2019-20														
Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points	
			L	P	T		T-I	T-II	Points	Time (Hrs)				
Theory Courses														
1	Electric Drives	PC-BTE701	3	-	-	3	20	20	100	3	60	-	100	
Laboratory Courses														
2	Electric Drives Laboratory	PC-BTE702	-	2	-	1	-	-	-	-	-	25	25	
Professional Electives														
3	PE3	PE-BTE7XX	3	--	1	4	20	20	100	3	60	25	125	
4	PE4	PE-BTE7XX	3	--	1	4	20	20	100	3	60	25	125	
Open Electives														
5	OE3	OE-BTX7XX	Refer Table OE 3			3	Refer Table OE 3							
Project														
6	Project Stage 1	PR-BTE701	0	(2+8) <sup>§</sup>	0	4						50 <sup>***</sup>	50	
	Total					20								
Value Added Courses														
7	Soft Computing I MATLAB/SCILAB	VA-BTE01	-	2	-	0	20	20	100	3	60	-	100	
8	Introduction to Python	VA-BTE02	-	2	-	0	20	20	100	3	60	-	100	
Non-technical Value Added Courses														
9	Non-technical value added course	VN-BTXXX		2		0	20	20	100	3	60	--	100	
Value added courses by industry														
10	Value added courses by Industry	VA-BTIXX	Refer Course Content			0	--	--	100	3	60	40	100	
Online Courses														
11	Online Course 1	OL-BTE501	-	-	-	0	-	-	-	-	-	-	-	
	<b>TOTAL</b>					<b>19</b>								



**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

L: Lecture P: Practical T: Tutorial

Professional Electives: PE3

PE-BTE701	Wind and Solar Energy Systems
PE-BTE702	Electrical Machine Design II
PE-BTE703	Design Management and Auditing of Electrical Systems
PE-BTE704	Digital Control Design

PE4

PE-BTE705	Restructuring and Deregulation of Power System
PE-BTE706	High Voltage Engineering
PE-BTE707	Power Electronics Applications in Power System

Open Electives: Table OE 3

List of Open Electives (Semester VII)													
Academic Year 2019-20													
Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
1	Computer Network	OE-BTE701	3	-	-	3	20	20	100	3	60	-	100
2	Engineering Economics	OE-BTE702	3	--	-	3	20	20	100	3	60	-	100
3	Embedded System	OE-BTE703	3	--	--	3	20	20	100	3	60	-	100
4	Internet of Things	OE-BTE704	3	--	--	3	20	20	100	3	60	-	100
5	Introduction to MEMS	OE-BTM714	2	--	1	3	20	20	100	3	60	25	125
6	Solar and Wind Technology	OE-BTM715	3	--	--	3	20	20	100	3	60	-	100
7	Internet of Things	OE-BTM716	2	--	1	3	20	20	100	3	60	25	125
8	Introduction to Augmented Reality	OE-BTM717	2	--	1	3	20	20	100	3	60	25	125
9	Fundamentals of AI and Machine Learning	OE-BTM718	2	--	1	3	20	20	100	3	60	25	125
10	Online Course from SWAYAM/NPTEL	OE-BTS7E1	0	0	0	3	--	--	100	--	100	--	100

## Sardar Patel College of Engineering Andheri (West), Mumbai 400 058

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### Value Added Courses by Industry

- VA-BTI01: Basic Automation – 1 (PLC and HMI )
- VA-BTI02: Basic Automation – 2 (Network and SCADA )
- VA-BTI03: Basics of Process Instrumentation
- VA-BTI04: Basic Mechatronics
- VA-BTI05: Basic LV - Switchgear and Motor
- VA-BTI06: Basic Drives (AC-DC Drives)
- VA-BTI07: Digitalization with Industry 4.0

### Non-technical value Added Courses

- VN-BT001: Ubuntu
- VN-BT002: Performing Arts and Script Writing
- VN-BT003: Financial Literacy
- VN-BT004: Self Defence Training program
- VN-BT005: Yoga health technology for self-management
- VN-BT006: Integrated self-management
- VN-BT007: Photography

- Note:
- (1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
  - (2) Laboratory course is considered as a separate head of passing.
  - (3) 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
  - (4) Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade of student.
  - (5) Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grade of the course will appear in the grade card of the student
  - (6) For Project course: \$ contact hours = 2 and self-learning hours =8. For project course, in-semester evaluation shall include one or more in-semester presentation. ## Report, \*\* Presentation and Viva Voce, \*\* Examined by supervisor and one internal examiner.
  - (7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) or value added courses offered by industry. These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.
  - (8) The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
  - (9) 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.
  - (10) For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing an online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Table GATE-MAP

<b>Sr. No.</b>	<b>Topics from GATE Syllabus</b>	<b>Related Core Courses in Electrical Engineering. Semester</b>
1	Section 1 Engineering Mathematics	Applied Mathematics I, II, III,IV
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 System I and II
7	Section 7 Control Systems	Control System
8	Section 8 Electrical and Electronic Measurements	Electrical and Electronics Measurements
9	Section 9 Analog and Digital Electronics	Electronic Circuits, Digital Electronics, Analog Circuits
10	Section 10 Power Electronics	Power Electronics

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Courses Offered for B.Tech. in Electrical Engineering (Semester VIII)													
Academic Year 2019-20													
Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Laboratory Courses													
1	Electronic Design Laboratory	PC-BTE801	2	2	-	3	--	--	--		--	50	50
Professional Electives													
2	PE5	PE-BTE8XX	3	--	1	4	20	20	100	3	60	25	125
3	PE6	PE-BTE8XX	3	--	1	4	20	20	100	3	60	25	125
Open Electives													
4	OE4	OE-BTX8XX	Refer Table OE 4			3	Refer Table OE 4						
Project													
5	Project Stage II	PR-BTE801	0	(2+14) <sup>\$</sup>	0	7						100 <sup>***</sup>	100
	Total					21							
Value Added Courses													
6	Soft Computing I MATLAB/SCILAB	VL-BTE01	-	2	-	0	20	20	100	3	60	-	100
7	Introduction to Python	VL-BTE02	-	2	-	0	20	20	100	3	60	-	100
9	Non-technical value added course	VN-BTXXX		2		0	20	20	100	3	60	--	100
Value Added Courses offered by Industry													
10	Value added courses by Industry	VA-BTIXX	Refer Course Content			0	--	--	100	3	60	40	100
Online Courses													
11	Online Course 1	OL-BTE501	-	-	-	0	-	-	-	-	-	-	-
	<b>TOTAL</b>					<b>21</b>							

L: Lecture P: Practical T: Tutorial

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Professional Electives: PE5

PE-BTE801	Power System Dynamics and Control
PE-BTE804	Power Quality and FACTS
PE-BTE806	Industrial Automation
PE-BTE808	Advanced Techniques in Power System Protection

PE6

PE-BTE802	Smart Grid
PE-BTE803	HVDC Transmission System
PE-BTE805	Advanced Electric Drives
PE-BTE807	Industrial Electrical Systems
PE-BTE809	Non linear control system

Open Electives: Table OE 4

List of Open Electives (Semester VIII)													
Academic Year 2019-20													
Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
1	Robotics	OE-BTE801	3	-	-	3	20	20	100	3	60	-	100
2	Power Plant Engineering	OE-BTE802	3	--	-	3	-	-	-	-	-	-	100
3	Electrical Engineering Materials	OE-BTE803	3	--	--	3	20	20	100	3	60	-	100
4	Medical Electronics	OE-BTE804	3	--	--	3	20	20	100	3	60	-	100
5	Image Processing	OE-BTE805	3	--	--	3	20	20	100	3	60	-	100
6	Introduction to Research Methodology	OE-BTM712	3	--	--	3	20	20	100	3	60	-	100
7	Value Engineering	OE-BTM719	2	--	1	3	20	20	100	3	60	25	125
8	Fire and Safety Management in Industry	OE-BTM720	3	--	--	3	20	20	100	3	60	-	100
9	Online Course from SWAYAM/NPTEL	OE-BTS8E1	0	0	0	3	--	--	100	--	100	--	100

## Sardar Patel College of Engineering Andheri (West), Mumbai 400 058

### Value Added Courses by Industry

- VA-BTI01: Basic Automation – 1 (PLC and HMI )
- VA-BTI02: Basic Automation – 2 (Network and SCADA )
- VA-BTI03: Basics of Process Instrumentation
- VA-BTI04: Basic Mechatronics
- VA-BTI05: Basic LV - Switchgear and Motor
- VA-BTI06: Basic Drives (AC-DC Drives)
- VA-BTI07: Digitalization with Industry 4.0

### Non-technical value Added Courses

- VN-BT001: Ubuntu
- VN-BT002: Performing Arts and Script Writing
- VN-BT003: Financial Literacy
- VN-BT004: Self Defence Training program
- VN-BT005: Yoga health technology for self-management
- VN-BT006: Integrated self-management
- VN-BT007: Photography

- Note:
- (1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
  - (2) Laboratory course is considered as a separate head of passing.
  - (3) 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
  - (4) Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade of student.
  - (5) Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grade of the course will appear in the grade card of the student
  - (6) For Project course: \$ contact hours = 2 and self-learning hours =8. For project course, in-semester evaluation shall include one or more in-semester presentation. ## Report, \*\* Presentation and Viva Voce, \*\* Examined by supervisor and one internal examiner.
  - (7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) or value added courses offered by industry. These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.
  - (8) The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
  - (9) 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.
  - (10) For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing an online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Table GATE-MAP

<b>Sr. No.</b>	<b>Topics from GATE Syllabus</b>	<b>Related Core Courses in Electrical Engineering. Semester</b>
1	Section 1 Engineering Mathematics	Applied Mathematics I, II, III,IV
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 System I and II
7	Section 7 Control Systems	Control System
8	Section 8 Electrical and Electronic Measurements	Electrical and Electronics Measurements
9	Section 9 Analog and Digital Electronics	Electronic Circuits, Digital Electronics, Analog Circuits
10	Section 10 Power Electronics	Power Electronics

**Sardar Patel College of Engineering, Andheri (West), Mumbai 400 058**

**T.Y.B.Tech. in Mechanical Engineering**  
**Course Credit System**  
**Academic Year 2019-20**

**NOTES:**

(1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details.

(2) Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: (i) Attendance in Laboratory/Tutorial = 20%, (ii) Journal/Drawing sheet/Sketch book = 40%, (iii) MCQ/Oral/Test = 40%.

(3) Laboratory course is considered as a separate head of passing.

(4) The Mandatory courses are with Pass (P) and No Pass (NP) grades and offered institute wide, may be available in both semesters of year and must be passed before obtaining degree.

(5) Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of the student.



- (6) Department will offer the Value Added courses in a semester subject to availability of resources and enrollment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grades of the courses will appear in the grade card of the student.
- (7) List of Professional Elective Courses being offered by department in a semester will be selected from Table PEC-TYBTECH for T.Y.B.Tech. and the list of elective courses being offered by department will be displayed at the beginning of semester.
- (8) List of Open Elective Courses being offered by institute in a semester will be selected from Table OEC-TYBTECH for T.Y.B.Tech. and the list of elective courses being offered by institute will be displayed at the beginning of semester.
- (9) For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing an online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing the elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation.
- (10) 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. The term work for these courses shall include evaluations along the pattern of GATE examinations, for example, part of the term work shall consist of MCQ similar to GATE examinations.
- (11) The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
- (12) One of the Course Outcome (CO), wherever applicable, shall include attainment of one of the essential skillsets: leadership skills, entrepreneurship skills, managerial skills, communication skills, collaborative skills.
- (13) Students can optionally opt for Value Added Non Technical courses offered by Center for Continuing Education (CCE-SPCE). These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card. The list of courses is given in Table-VNT
- (14) L- Lecture, P- Laboratory, T-Tutorial.

**Sardar Patel College of Engineering**  
**Academic Year 2019-20**  
**Courses Offered for Third Year B.Tech. in Mechanical Engineering (Semester V)**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/P ractical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
<b>Core Courses</b>													
1	Heat and Mass Transfer	PC-BTM501	3	0	0	3	20	20	100	3	60%	0	100
2	Mechatronics	PC-BTM503	3	0	0	3	20	20	100	3	60%	0	100
3	Dynamics of Machinery	PC-BTM512	2	0	0	2	20	20	100	3	60%	0	100
4	Thermal Systems	PC-BTM514	3	0	0	3	20	20	100	3	60%	0	100
5	Computer Aided Machine Drawing	PC-BTM515	1	0	0	1	20	20	100	3	60%	0	100
<b>Laboratory Courses (Note 3)</b>													
6	Heat and Mass Transfer Lab.	PC-BTM551	0	2	0	1	0	0	0	0	0	50	50
7	Mechatronics Lab.	PC-BTM553	0	2	0	1	0	0	0	0	0	50	50
8	Dynamic of Machinery Lab.	PC-BTM562	0	2	0	1	0	0	0	0	0	50	50
9	Thermal Systems Laboratory	PC-BTM564	0	2	0	1	0	0	0	0	0	50	50
10	Computer Aided Machine Drawing Lab.	PC-BTM565	0	2	0	1	0	0	0	0	0	50	50
<b>Professional Elective Course - I (Note 7)</b>													
11	Professional Elective Course - I	PE-BTM5xx	Refer Table PEC-TYBTECH			4	Refer Table PEC-TYBTECH						
<b>Mandatory Courses (Note 4)</b>													
12	Health Safety and Environment (HSE)*	MC-BTM003	2	0	1	0	20	20	100	3	60%	25	125
<b>Online Courses (Note 5)</b>													
13	Online Course	OL-BTM58x	0	0	0	0	0	0	0	0	0	0	0
<b>Value Added Courses (Note 6)</b>													
14	Reverse Engineering and Product Development	VA-BTM591	2	-	-	0	20	20	100	3	60%	0	100
<b>Value Added Non-Technical Courses (Note13)</b>													
15	Refer Table-VNT	VN-BTxxx	Refer Table-VNT										
	<b>TOTAL</b>					<b>21</b>							

(\*): The course MC-BTM003 may be offered by department for its completion in online mode on SWAYAM/NPTEL portal by registering for an equivalent course approved by the department. In such case, student must obtain online course completion certificate for passing the course.

**Sardar Patel College of Engineering**  
**Academic Year 2019-20**  
**Courses Offered for Third Year B.Tech. in Mechanical Engineering (Semester VI)**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
<b>Core Courses</b>													
1	Manufacturing Planning and Control	PC-BTM605	3	0	1	4	20	20	100	3	60%	25	125
2	CAD/CAM/CIM	PC-BTM606	2	0	0	2	20	20	100	3	60%	0	100
3	Refrigeration and Air-conditioning	PC-BTM611	2	0	0	2	20	20	100	3	60%	0	100
4	Machine Design	PC-BTM612	3	0	1	4	20	20	100	3	60%	25	125
5	Internal Combustion Engine	PC-BTM614	2	0	0	2	20	20	100	3	60%	0	100
<b>Laboratory Courses (Note 3)</b>													
6	CAD/CAM/CIM Laboratory	PC-BTM656	0	2	0	1	0	0	0	0	0	50	50
7	Refrigeration and Air-conditioning Laboratory	PC-BTM661	0	2	0	1	0	0	0	0	0	50	50
8	Internal Combustion Engine Laboratory	PC-BTM664	0	2	0	1	0	0	0	0	0	50	50
<b>Professional Elective Course - II (Note 7)</b>													
9	Professional Elective Course - II	PE-BTM5xx	Refer Table PEC-TYBTECH			4	Refer Table PEC-TYBTECH						
<b>Open Elective Course - I (Note 8,9)</b>													
10	Open Elective Course - I	OE-BTx6xx	Refer Table OEC-TYBTECH			3	Refer Table OEC-TYBTECH						
<b>Online Courses (Note 5)</b>													
11	Online Course	OL-BTM68x	0	0	0	0	0	0	0	0	0	0	0
<b>Value Added Courses (Note 6)</b>													
12	CNC Programming	VA-BTM691	2	0	1	0	20	20	100	3	60%	25	125
<b>Value Added Non-Technical Courses (Note13)</b>													
13	Refer Table-VNT	VNT-BTxxx	Refer Table-VNT										
	<b>TOTAL</b>					<b>24</b>							

**Sardar Patel College of Engineering**

**Academic Year 2019-20**

**TABLE PEC-TYBTECH: Professional Elective Courses - I and II for Third Year B.Tech. in Mechanical Engineering (Semester V and VI)**

Sr. No.	Course Name	Specialization	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
				L	P	T		T-I	T-II	Points	Time (Hrs)			
Professional Elective Courses I and II														
1	<i>Finite Element Methods for Mech. Engineers(*)</i>	D	PE-BTM511	3	2	0	4	20	20	100	3	60%	50	150
2	Automation of Engineering Drawings	D	PE-BTM512	3	2	0	4	20	20	100	3	60%	50	150
3	Design Thinking	D	PE-BTM513	3	0	1	4	20	20	100	3	60%	25	125
4	Intro. to System Modelling & Analysis	D	PE-BTM514	3	0	1	4	20	20	100	3	60%	25	125
5	Knowledge Based Engineering	D	PE-BTM515	3	0	1	4	20	20	100	3	60%	25	125
6	Smart Product Development	D	PE-BTM516	3	2	0	4	20	20	100	3	60%	50	150
7	Synthesis of Mechanisms	D	PE-BTM517	3	0	1	4	20	20	100	3	60%	25	125
8	Mechanical Vibrations	D	PE-BTM518	3	0	1	4	20	20	100	3	60%	25	125
9	Digital Manufacturing	M	PE-BTM531	3	0	1	4	20	20	100	3	60%	25	125
10	Intro. to Composite Material Technology	M	PE-BTM532	3	0	1	4	20	20	100	3	60%	25	125
11	Intro. to Computer Integrated Manufacturing	M	PE-BTM533	3	0	1	4	20	20	100	3	60%	25	125
12	Lean and Green Manufacturing	M	PE-BTM534	3	0	1	4	20	20	100	3	60%	50	150
13	Non-Destructive Testing	M	PE-BTM535	3	2	0	4	20	20	100	3	60%	50	150
14	Product Lifecycle Management	M	PE-BTM536	3	0	1	4	20	20	100	3	60%	25	125
15	Tool Engineering	M	PE-BTM537	3	0	1	4	20	20	100	3	60%	25	125
16	<i>Industrial Mgmt. and Entrepreneurship (*)</i>	M	PE-BTM538	3	0	1	4	20	20	100	3	60%	25	125
17	Additive Manufacturing	M	PE-BTM539	3	0	1	4	20	20	100	3	60%	25	125
18	Advanced Manufacturing Processes	M	PE-BTM540	3	0	1	4	20	20	100	3	60%	25	125
19	Advanced Heat Transfer	T	PE-BTM551	3	0	1	4	20	20	100	3	60%	25	125
20	Hydraulic Machinery	T	PE-BTM552	3	2	0	4	20	20	100	3	60%	50	150
21	Introduction to Aerodynamics	T	PE-BTM553	3	0	1	4	20	20	100	3	60%	25	125
22	Compressible Fluid Flow	T	PE-BTM554	3	0	1	4	20	20	100	3	60%	25	125

**Note:** Specializations are: D - Design, M - Manufacturing, T - Thermal Engineering

(\*) This course may be simultaneously offered to both T.Y.B.Tech. and Final Year B.Tech. students.

Refer to Table PEC-BTECH for additional professional elective courses available to T.Y.B.Tech. students, if any.

**Sardar Patel College of Engineering**

**Academic Year 2019-20**

**TABLE OEC-TYBTECH: Open Elective Courses - I for Third Year B.Tech. in Mechanical Engineering (Semester VI)**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/P ractical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Open Elective Courses - I													
1	Computational Methods	OE-BTM611	2	0	1	3	20	20	100	3	60%	25	125
2	Introduction to Nanotechnology	OE-BTM612	3	0	0	3	20	20	100	3	60%	0	100
3	Entrepreneurship Development and Start-up	OE-BTM613	2	0	1	3	20	20	100	3	60%	25	100
4	Introduction to Optimization Methods	OE-BTM614	2	0	1	3	20	20	100	3	60%	25	125
5	<i>Project Management (*)</i>	<i>OE-BTM615</i>	2	2	0	3	20	20	100	3	60%	50	150
6	Project Management	OE-BTE601	3	0	0	3	20	20	100	3	60%	0	100
7	Artificial Intelligence	OE-BTE602	3	0	0	3	20	20	100	3	60%	0	100
8	Human Resources Dev. & Organizational Behaviour	OE-BTC611	3	0	0	3	20	20	100	3	60%	0	100
9	Sustainable Development	OE-BTC612	3	0	0	3	20	20	100	3	60%	0	100
10	Watershed Development and Management	OE-BTC613	3	0	0	3	20	20	100	3	60%	0	100
11	Artificial Intelligence Techniques	OE-BTC614	3	0	0	3	20	20	100	3	60%	0	100
12	Numerical Computations	OE-BTC615	3	0	0	3	20	20	100	3	60%	0	100
13	Engineering System and Development	OE-BTC616	3	0	0	3	20	20	100	3	60%	0	100
14	Online Course from SWAYAM/NPTEL (Note 9)	OE-BTS6Mx	0	0	0	3	0	0	100	0	100%	0	100

(\*) This course may be simultaneously offered to both T.Y.B.Tech. and Final Year B.Tech. students.

Refer to Table OEC-BTECH for additional open elective courses available to T.Y.B.Tech. students, if any.

**Sardar Patel College of Engineering  
Academic Year 2019-20**

**TABLE VNT: Value Added Non-Technical Courses for B.Tech. and M.Tech. Programmes**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/P ractical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Professional Elective Courses I and II													
1	UBUNTU	VN-BT001	Refer to Course Contents			0							Refer to Course Contents
2	Performing Arts and Script Writing	VN-BT002		0									
3	Financial Literacy	VN-BT003		0									
4	Self Defense Training	VN-BT004		0									
5	Yoga Health Technology for Self Management	VN-BT005		0									
6	Integrated Self Management	VN-BT006		0									
7	Photography	VN-BT007		0									

**Table GATE-MAP: Alignment of Course Content with GATE Syllabus (2019)**  
**B.Tech. in Mechanical Engineering**

No.	Section	Core courses in SPCE Curriculum 2019-20	Topics From GATE Syllabus (2019)
1	D	Machine Design	Machine Design
2	D	Design of Machines and Mech. Systems	Machine Design
3	D	Kinematics of Machinery	Theory of Machines
4	D	Dynamics of Machinery	Theory of Machines, Vibrations
5	D	Solid Mechanics	Mechanics of Materials
6	D	Strength of Materials	Mechanics of Materials
7	D	Computer Aided Machine Drawing	Machine Design
8	M	CAD/CAM/CIM	Computer Integrated Manufacturing
9	M	Mechanical Engineering Measurements	Metrology and Inspection
10	M	Manufacturing Science	Casting, Forming and Joining Processes; Machining and machine tool operations
11	M	Manufacturing Planning and Control	Production Planning and Control, Inventory Control, Operations Research
12	M	Mechatronics	Computer Integrated Manufacturing
13	M	Ind. Engg. And Proj./Fin. Mgmt.	Production Planning and Control, Operations Research
14	M	Material Science	Engineering materials
15	T	Thermal Systems	Applications of Fluid mechanics and Thermal sciences
16	T	Fluid Mechanics	Fluid Mechanics
17	T	Heat and Mass Transfer	Heat-Transfer
18	T	Refrigeration and Air-conditioning	Applications of Fluid mechanics and Thermal sciences
19	T	Thermodynamics	Thermodynamics
20	T	Internal Combustion Engine	Applications of Fluid mechanics and Thermal sciences
21	MATH	Applied Mathematics, I, II, III, IV	Linear Algebra, Calculus, Differential Equations, Complex variables, Probability and Statistics, Numerical Methods

**Note:**Sections are: D - Applied Mechanics and Design, M -Materials, Manufacturing and Industrial Engineering, T - Fluid Mechanics and Thermal Sciences, MATH - Engineering Mathematics

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Academic Book**  
**Year: 2019-20**

**T.Y. B.Tech. In Civil Engineering**

**Sem. V & VI**

**Academic Evaluation Scheme**

**Year 2019-20**



Sardar Patel College of Engineering Andheri (West), Mumbai 400 058

Academic Book

Year: 2019-20

Scheme for T.Y.B.Tech.in Civil Engineering, (Semester - V) Year 2019-20

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Core Courses													
1	Structural Engineering	PC-BTC501	2	0	1	3	20	20	100	3	60%	25#	125
2	Hydrology & Water Resources Engineering	PC-BTC502	2	0	1	3	20	20	100	3	60%	25#	125
3	Design of RCC Elements (Limit State Method)	PC-BTC503	2	0	1	3	20	20	100	3	60%	25#	125
4	Highway Engineering	PC-BTC504	2	0	0	2	20	20	100	3	60%	0	100
5	Foundation Engineering	PC-BTC505	2	0	0	2	20	20	100	3	60%	0	100
6	Environmental Engineering-II	PC-BTC506	2	0	0	2	20	20	100	3	60%	0	100
7	Organizational Communication and Interpersonal Skills	HSM-BTC507	2	0	1	3	20	20	100	3	60%	25#	125
Laboratory Courses (Note 2&3)													
8	Highway Engineering (Lab)	PC-BTC551	0	2	0	1	0	0	0	0	0	25#	25#
Online Courses (Note 5)													
9	Online Course	OL-BTCxxx	3	0	0	0	0	0	0	0	0	0	0
Value Added Courses (Note7)													
10	Introduction to Offshore Engineering	VA –BTC 572	2	0	0	0	20	20	100	3	60%	0	100
11	Legal Aspects in Projects	VA –BTC 573	1	0	1	0	20	20	100	3	60%	25#	125
Value Added Non-Technical Courses (Note10)													

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Academic Book**

**Year: 2019-20**

13	Refer Table-VNT	VNT-BTxxx	Refer Table-VNT												
	<b>TOTAL</b>		<b>14</b>	<b>2</b>	<b>4</b>	<b>19</b>									

**Non-technical value Added Courses-VNT**

VN-BT001: Ubuntu

VN-BT002: Performing Arts and Script Writing

VN-BT003: Financial Literacy

VN-BT004: Self Defence Training program

VN-BT005: Yoga health technology for self-management

VN-BT006: Integrated self-management

VN-BT007: Photography

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Academic Book**  
**Year: 2019-20**

**Notes:**

1. Refer (i) Academic rules and regulations (ii) Examination rules and regulations for further details.
2. Laboratory course is considered as a separate head of passing
3. # 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
4. A) For courses having **2 hours per week lecture / 5 modules:**

<b>Sr. No.</b>	<b>Examination</b>	<b>Module</b>
1	T – I	Module 1 & Part of Module 2
2	T – II	Part of Module 2 & Module 3
3	Final Examination	Module 1 to 5

- B) For courses having **3 hours per week lecture / 7 modules:**

<b>Sr. No.</b>	<b>Examination</b>	<b>Module</b>
1	T – I	Module 1 ,2
2	T – II	Module 3, 4
3	Final Examination	Module 1 to 7

5. Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of the student.
6. The Mandatory courses are with Pass (P) and No Pass (NP) grades.
7. Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grade of the course will appear in 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. The term work for these courses shall include evaluations along the pattern of GATE examinations, for

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Academic Book**

**Year: 2019-20**

example, part of the term work shall consist of MCQ similar to GATE examinations. GATE-MAP table is given at the end of final year B.Tech-Civil Engg. Credit System .

9. The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
10. Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE). These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.

Sardar Patel College of Engineering Andheri (West), Mumbai 400 058

Academic Book

Year: 2019-20

Scheme for T.Y.B.Tech.in Civil Engineering, (Semester - VI) Year 2019-20

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work/Practical	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Core Courses													
1	Construction Engineering & Management	PC-BTC601	2	0	1	3	20	20	100	3	60%	25#	125
2	Design of Steel Structures	PC-BTC602	2	0	1	3	20	20	100	3	60%	25#	125
3	Professional Elective - I	REFER TABLE - ELECTIVE CORE I	3	0	0	3	20	20	100	3	60%	25#	125
4	Professional Elective II	REFER TABLE - ELECTIVE CORE II	3	0	0	3	20	20	100	3	60%	0	100
5	Professional Elective III	REFER TABLE - ELECTIVE CORE III	3	0	0	3	20	20	100	3	60%	0	100
6	Open Elective-I	REFER TABLE - OPEN ELECTIVE I	3	0	0	3	20	20	100	3	60%	0	100
Online Courses (Note 5)													
12	Online Course	OL-BTC xxx	3	0	0	0	0	0	0	0	0	0	0
Value Added Courses (Note 7)													
13	Geographic Information System (GIS) and its Applications	VA-BTC671	1	0	1	0	20	20	100	3	60	25#	125
14	Business and Professional Communication	VA-BTC672	1	0	1	0	20	20	100	3	60	25#	125
Value Added Non-Technical Courses (Note 10)													
15	Refer Table-VNT	VNT-BTxxx	Refer Table-VNT										
	<b>TOTAL</b>		<b>16</b>	<b>0</b>	<b>2</b>	<b>18</b>							

**Non-technical value Added Courses-VNT**

VN-BT001: Ubuntu

VN-BT002: Performing Arts and Script Writing

VN-BT003: Financial Literacy

VN-BT004: Self Defence Training program

VN-BT005: Yoga health technology for self-management

VN-BT006: Integrated self-management

VN-BT007: Photography

**Elective Core – I**

<b>Specialization</b>	<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>
Structures	1	PE-BTC621	Analysis of Indeterminate Structures
Water Resources	2	PE-BTC631	Hydraulic structures & Irrigation Engineering
	3	PE-BTC 632	Introduction to Offshore Engineering
Construction Management	4	PE-BTC641	Special Construction Materials & Methods
Environmental Engg.	5	PE-BTC 651	Solid and Hazardous Waste Management
	6	PE-BTC 652	Air and Noise Pollution Control
Transportation and Geo-Tech	7	PE-BTC 661	Pavement Subgrade and Materials

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Academic Book**  
**Year: 2019-20**

**Elective Core – II**

<b>Specialization</b>	<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>
Structures	1	PE-BTC 622	Repairs and Rehabilitation of Structures
Water Resources	2	PE-BTC 633	Open Channel Flow
	3	PE-BTC 634	Ground Water Development and Management
Construction Management	4	PE-BTC 642	Disaster Preparedness , Planning and Management
	5	PE-BTC 643	Infrastructure Planning and Management
Environmental Engg.	6	PE-BTC 653	Rural Water Supply and Sanitation
Transportation and Geo-Tech	7	PE-BTC 662	Low Cost Roads

**Elective Core – III**

<b>Specialization</b>	<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>
Structures	1	PE-BTC 623	Prestressed Concrete
Water Resources	2	PE-BTC 635	Urban Hydrology and Hydraulics
Construction Management	3	PE-BTC 644	TQM and MIS in Construction
Environmental Engg.	4	PE-BTC 654	Physico chemical Processes
Transportation and Geo-Tech	5	PE-BTC 663	Traffic Engineering & Control

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Academic Book**  
**Year: 2019-20**

**Open Elective-I**

<b>Sr. No.</b>	<b>Code</b>	<b>Elective</b>
1	OE-BTC 611	Human Resources Development and Organizational Behavior
2	OE-BTC 612	Sustainable Development
3	OE-BTC 613	Watershed Development and Management
4	OE-BTC 614	Artificial Intelligence Techniques
5	OE-BTC 615	Numerical Computations
6	OE-BTC 616	Engineering System and Development
7	OE-BTE601	Project Mangement
8	OE-BTE602	Artificial intelligence
9	OE-BTM611	Computational Methods
10	OE-BTM613	Entrepreneurship Development and Start-up
11	OE-BTM614	Introduction to Optimization Methods
12	OE-BTM615	Project Management
13	OE-BTS 6C1	Online Course from SWAYAM/NPTEL- Sustainable Materials and Green Buildings (Note 9)



**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Academic Book**  
**Year: 2019-20**

**Notes:**

1. Refer (i) Academic rules and regulations (ii) Examination rules and regulations for further details.
2. Laboratory course is considered as a separate head of passing
3. # 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
4. A) For courses having **2 hours per week lecture / 5 modules:**

<b>Sr. No.</b>	<b>Examination</b>	<b>Module</b>
1	T – I	Module 1 & Part of Module 2
2	T – II	Part of Module 2 & Module 3
3	Final Examination	Module 1 to 5

- B) For courses having **3 hours per week lecture / 7 modules:**

<b>Sr. No.</b>	<b>Examination</b>	<b>Module</b>
1	T – I	Module 1 ,2
2	T – II	Module 3, 4
3	Final Examination	Module 1 to 7

5. Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of the student.
6. The Mandatory courses are with Pass (P) and No Pass (NP) grades.
7. Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grade of the course will appear in the grade card of the student

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Academic Book**

**Year: 2019-20**

8. List of Professional Elective Courses being offered by department in a semester will be selected from Table Elective Core I, II and III and the list of elective courses being offered by department will be displayed at the beginning of semester.
9. List of Open Elective Courses being offered by institute in a semester will be selected from Table-Open Elective –I and the list of elective courses being offered by department will be displayed at the beginning of semester.
10. For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing an online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation.
11. 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. The term work for these courses shall include evaluations along the pattern of GATE examinations, for example, part of the term work shall consist of MCQ similar to GATE examinations. GATE-MAP table is given at the end of final year B.Tech-Civil Engg. Credit System .
12. The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
13. Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE). These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**BVB's Sardar Patel College of Engineering, Mumbai**

**Department of Electrical Engineering**

**Credit System**

**T. Y. B.Tech in Electrical Engineering**

**Academic Year 2019-2020**

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Courses Offered for Third Year B.Tech. in Electrical Engineering (Semester V)													
Academic Year 2019-20													
Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
Theory Courses													
1	Electromagnetic Fields and Waves	PC-BTE501	3	-	-	3	20	20	100	3	60	--	100
2	Control System	PC-BTE502	3	-	-	3	20	20	100	3	60	-	100
3	Electrical Machines II	PC-BTE503	3	-	--	3	20	20	100	3	60	--	100
4	Power System I	PC-BTE504	3	-	1	4	20	20	100	3	60	25	125
5	Power Electronics	PC-BTE505	3	-	-	3	20	20	100	3	60	--	100
Laboratory Courses													
6	Control System Laboratory	PC-BTE506	-	2	-	1	-	-	-	-	-	25	25
7	Electrical Machines II Laboratory	PC-BTE507	-	2	-	1	-	-	-	-	-	25	25
8	Power Electronics Laboratory	PC-BTE508		2	--	1						25	25
9	Electromagnetic Fields and Waves Laboratory	PC-BTE509		2	--	1						25	25
Professional Electives													
9	PE1	PE-BTE5XX	3	--	1	4	20	20	100	3	60	25	125
	Total					24							
Value Added Courses													
10	Soft Computing I	VA-BTE01	-	2	-	0	20	20	100	3	60	-	100
11	Introduction to Python	VA-BTE02	-	2	-	0	20	20	100	3	60	-	100
12	Finite Element Methods for Electrical Engineering	VA-BTE05	-	2	-	0	20	20	100	3	60	-	100
Non –technical Value Added Courses													
13	Non-technical value added course	VN-BTXX		2		0	20	20	100	3	60	--	100
Value added courses by industry													
14	Value added courses by Industry	VA-BTIXX	Refer Course Content			0	--	--	100	3	60	40	100
Online Courses													
15	Online Course 1	OL-BTE501	-	-	-	0	-	-	-	-	-	-	-
	<b>TOTAL</b>		<b>18</b>	<b>8</b>	<b>2</b>	<b>24</b>							<b>750</b>

L:Lecture P: Practical T: Tutorial

## Sardar Patel College of Engineering Andheri (West), Mumbai 400 058

Professional Electives (PE I): PE-BTE501: Digital Signal Processing  
PE-BTE502: Computer Architecture

### Value Added Courses by Industry

VA-BTI01: Basic Automation – 1 (PLC and HMI )  
VA-BTI02: Basic Automation – 2 (Network and SCADA )  
VA-BTI03: Basics of Process Instrumentation  
VA-BTI04: Basic Mechatronics  
VA-BTI05: Basic LV - Switchgear and Motor

### Non-technical value Added Courses

VN-BT001: UBUNTU  
VN-BT002: Performing Arts and Script Writing  
VN-BT003: Financial Literacy  
VN-BT004: Self Defence Training program  
VN-BT005: Yoga health technology for self-management  
VN-BT006: Integrated self-management  
VN-BT007: Photography

- Note**
- (1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
  - (2) Laboratory course is considered as a separate head of passing.
  - (3) 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
  - (4) Student can opt for a online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, 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 the 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 will appear in the grade card of the student.
  - (7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) or value added courses offered by industry. These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.
  - (8) The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
  - (9) 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.

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Table GATE MAP

<b>Sr. No.</b>	<b>Topics from GATE Syllabus</b>	<b>Related Core Courses in Electrical Engineering. Semester</b>
1	Section 1 Engineering Mathematics	Applied Mathematics I, II, III,IV
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 System I and II
7	Section 7 Control Systems	Control System
8	Section 8 Electrical and Electronic Measurements	Electrical and Electronics Measurements
9	Section 9 Analog and Digital Electronics	Electronic Circuits, Digital Electronics, Analog Circuits
10	Section 10 Power Electronics	Power Electronics

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Courses Offered for Third Year B.Tech. in Electrical Engineering (Semester VI)  
Academic Year 2019-20**

Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
<b>Theory Courses</b>													
1	Power System II	PC-BTE601	3	-	1	4	20	20	100	3	60	25	125
2	Switchgear and Protection	PC-BTE602	3	-	-	3	20	20	100	3	60	-	100
<b>Laboratory Courses</b>													
3	Switchgear and Protection Laboratory	PC-BTE603	-	2	-	1	-	-	-	-	-	25	25
4	Electrical Simulation Laboratory	PC-BTE604	-	2	-	1	-	-	-	-	-	25	25
<b>Professional Electives</b>													
5	PE2	PE-BTE6XX	3	--	1	4	20	20	100	3	60	25	125
<b>Open Electives</b>													
6	OE1	OE-BTX6XX	Refer Table OE 1			3	Refer Table OE 1						
7	OE2	OE-BTX6XX	Refer Table OE 2			3	Refer Table OE 2						
	Total					19							
<b>Value Added Courses</b>													
8	PLC	VA-BTE01	-	2	-	0	20	20	100	3	60	-	100
9	Soft computing II ETAP and WAMS	VA-BTE06	-	2	-	0	20	20	100	3	60	-	100
<b>Non-Technical Value Added Courses</b>													
10	Non-technical value added course	VN-BTXXX		2		0	20	20	100	3	60	--	100
<b>Value added courses by industry</b>													
11	Value added courses by Industry	VA-BTIXX	Refer Course Content			0	--	--	100	3	60	40	100
<b>Online Courses</b>													
12	Online Course 1	OL-BTE601	-	-	-	0	-	-	-	-	-	-	-
<b>Mandatory Courses</b>													
13	Environmental Science *	MC-BTE03	3	0	0	0	20	20	100	3	60	-	100
	<b>TOTAL</b>					<b>19</b>							

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

L: Lecture P: Practical T: Tutorial

(\*): The course MC-BTE003 may be offered by department for its completion in online mode on SWAYAM/NPTEL portal by registering for an equivalent course approved by the department. In such case, student must obtain online course completion certificate for passing the course.

Professional Electives (PE2): PE-BTE601: Electrical Machine Design I  
PE-BTE602: Control Systems Design

Open Electives: Table OE 1

List of Open Electives (Semester VI)													
Academic Year 2019-20													
Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
1	Project Management	OE-BTE601	3	-	-	3	20	20	100	3	60	-	100
2	Artificial Intelligence	OE-BTE602	3	--	-	3	20	20	100	3	60	-	100
3	Introduction to Nanotechnology	OE-BTM612	3	--	-	3	20	20	100	3	60	-	100
4	Project Management	OE-BTM615	2	2	--	3	20	20	100	3	60	50	150
5	Human Resource Development and Organizational Behavior	OE-BTC611	3	--	--	3	20	20	100	3	60	-	100
6	Artificial Intelligence Techniques	OE-BTC614	3	-	-	3	20	20	100	3	60	-	100
7	Engineering System and Development	OE-BTC616	3	-	-	3	20	20	100	3	60	-	100
8	Online Course from SWAYAM/NPTEL	OE-BTS6E1	0	0	0	3	--	--	100	--	100	--	100



**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Open Electives: Table OE 2

List of Open Electives (Semester VI)													
Academic Year 2019-20													
Sr. No	Course Name	Code	Course Plan per Week (Hrs)			Credits	In semester Evaluation (Points)		End Semester Evaluation (Points)		End semester weightage (%)	Term work	Total Points
			L	P	T		T-I	T-II	Points	Time (Hrs)			
1	Communication Engineering	OE-BTE603	3	-	-	3	20	20	100	3	60	-	100
2	VLSI circuits	OE-BTE604	3	--	-	3	20	20	100	3	60	-	100
3	Entrepreneurship Development and Start-up,	OE-BTM613	2	--	1	3	20	20	100	3	60	25	125
4	Introduction to Optimization Methods	OE-BTM614	2	--	1	3	20	20	100	3	60	25	125
5	Watershed Development and Management	OE-BTC613	3	-	-	3	20	20	100	3	60	-	100
6	Online Course from SWAYAM/NPTEL	OE-BTS6E2	0	0	0	3	--	--	100	--	100	--	100

Value Added Courses by Industry

- VA-BTI01: Basic Automation – 1 (PLC and HMI )
- VA-BTI02: Basic Automation – 2 (Network and SCADA )
- VA-BTI03: Basics of Process Instrumentation
- VA-BTI04: Basic Mechatronics
- VA-BTI05: Basic LV - Switchgear and Motor

## Sardar Patel College of Engineering Andheri (West), Mumbai 400 058

### Non-technical value Added Courses

- VN-BT001: UBUNTU
- VN-BT002: Performing Arts and Script Writing
- VN-BT003: Financial Literacy
- VN-BT004: Self Defence Training program
- VN-BT005: Yoga health technology for self-management
- VN-BT006: Integrated self-management
- VN-BT007: Photography

- Note**
- (1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
  - (2) Laboratory course is considered as a separate head of passing.
  - (3) 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 (Preferably MCQs based on GATE syllabus) (and/or) Seminar (and/or) Oral (and/or) Industry visit report= 40%.
  - (4) Student can opt for a online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of student.
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  - (7) Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE) value added courses offered by industry. These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card.
  - (8) The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
  - (9) 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.
  - (10) For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing a online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

Table GATE MAP

<b>Sr. No.</b>	<b>Topics from GATE Syllabus</b>	<b>Related Core Courses in Electrical Engineering. Semester</b>
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6	Section 6 Power Systems	Power System I and II
7	Section 7 Control Systems	Control System
8	Section 8 Electrical and Electronic Measurements	Electrical and Electronics Measurements
9	Section 9 Analog and Digital Electronics	Electronic Circuits, Digital Electronics, Analog Circuits
10	Section 10 Power Electronics	Power Electronics