

B.Tech. In Civil Engineering Sem. VII & VIII

Academic Evaluation Scheme

Year 2021-22

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

Scheme for Final Year B.Tech.in Civil Engineering, (Semester - VII) Academic Year 2021-22

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	Design of concrete structures	PC-BTC701	3	0	1	4	20	20	100	3	60%	25#	125
2	Professional Elective III	Refer Elective III Table	3	0	0	3	20	20	100	3	60%	0	100
3	Professional Elective IV	Refer Elective IV Table	3	0	0	3	20	20	100	3	60%	0	100
4	Open Elective II	Refer Open Elective II Table	3	0	0	3	20	20	100	3	60%	0	100
5	Project-Stage I	PROJ-BTC751	0	(2+6) ^{\$}	0	4	0	0	0	0	0%	50###** (Note 9)	50
Online Courses (Note 5)													
6	Online Course	OL-BTCxxx	3	0	0	0	0	0	0	0	0	0	0
Value Added Courses (Note 7)													
7	Environmental Impact Assessment and Mgt.	VA-BTC772	2	0	0	AU	20	20	100	3	60%	0	100
8	Conventional and Nonconventional Materials in Highway Sub-grade	VA-BTC773	2	0	0	AU	20	20	100	3	60%	25#	125
Value Added Non-Technical Courses (Note 12)													
9	Non-technical value added course	VN-BTXXX	Refer Table-VNT										
	TOTAL		12	8	1	17							

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

Professional Elective – III

Specialization	Sr. No.	Code	Elective
Structures	1	PE-BTC721	Advanced Structural Analysis
	2	PE-BTC 722	Structural analysis by Matrix Methods
Water Resources	3	PE-BTC 731	Surface Hydrology
Environmental Engg.	4	PE-BTC 741	Water and Air quality Modelling
Transportation and Geo-Tech	5	PE-BTC 761	Pavement Design & Construction
	6	PE-BTC 762	Advanced Foundation Engineering
	7	PE-BTC 763	Rock Mechanics

Professional Elective – IV

Specialization	Sr. No.	Code	Elective
Structures	1	PE-BTC 723	Structural dynamics
	2	PE-BTC 724	Advanced Design of Steel Structures
Water Resources	3	PE-BTC732	Hydraulic Modelling
Environmental Engg	4	PE-BTC 742	Sustainable Engineering and technology
	5	PE-BTC743	Industrial Wastewater treatment
Construction Management	6	PE-BTC 751	Engineering risk and uncertainty
	7	PE-BTC752	Infrastructure Planning and Management
Transportation and Geo-Tech	8	PE-BTC 764	Design and Construction of Rigid Pavements

Open Elective-II

Sr. No.	Code	Elective
1	OE-BTC 711	Economic policies of India
2	OE-BTC 712	Entrepreneurship, Innovation and Design Thinking
3	OE-BTC 713	Disaster Management and preparedness
4	OE-BTC 714	Engineering System and development
5	OE-BTE 701	Computer network
6	OE-BTE 702	Engineering economics
7	OE-BTE 703	Embedded system
8	OE-BTE 704	Internet of things
9	OE-BTM 714	Introduction to Micro-Electro-Mechanical Systems (MEMS)
10	OE-BTM 715	Solar and Wind Technology
11	OE-BTM 717	Introduction to Augmented Reality
12	OE-BTM 718	Fundamental of Artificial Intelligence (AI) and Machine Learning

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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 professional elective III and IV 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 2021-22

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	Engineering Economics Estimation and Costing			PC-BTC801	3	0	1	4	20	20	100	3	60%	25#	125
2	Elective V			Refer Elective V Table	2	0	0	2	20	20	100	3	60%	0	100
3	Elective VI			Refer Elective VI Table	3	0	0	3	20	20	100	3	60%	0	100
4	Open Elective III	OR	Internship	Refer Open Elective III Table	3	0	0	3	20	20	100	3	60%	0	100
5	Project –Stage II*			PROJ-BTC851	0	(2+12) \$	0	7	0	0	0	0	0%	100###**(Note 9)	100
Online Courses (Note 5)															
8	Online Course			OL-BTCxxx	3	0	0	0	0	0	0	0	0	0	0
Value Added Courses (Note 7)															
15	Low Cost Rural Roads			VA-BTC873	2	0	1	AU	20	20	100	3	60%	25#	125
Value Added Non-Technical Courses (Note12)															
18	Refer Table-VNT			VN-BTxxx	Refer Table-VNT										
	TOTAL				11	14	1	19							

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

Professional Elective – V

Specialization	Sr. No.	Code	Elective
Structures	1	PE-BTC824	Finite Element Analysis
	2	PE-BTC825	Advanced structural mechanics
Water Resources	4	PE-BTC832	Water Resources Economics Planning and Management
Environmental Engg	5	PE-BTC842	Environmental Law and Policy
Construction Management	6	PE-BTC853	Valuation and Value Engineering
	7	PE-BTC854	Risk and Disaster management
Transportation and Geo-Tech	8	PE-BTC863	Transportation Planning and Economics

Professional Elective – VI

Specialization	Sr. No.	Code	Elective
Structures	1	PE-BTC821	Earthquake Engineering
	2	PE-BTC822	Bridge Engineering
	3	PE-BTC 823	Decision and Risk analysis
Water Resources	4	PE-BTC831	Introduction to Offshore Engineering
Environmental Engg	5	PE-BTC841	Environmental Impact assessment
Construction Management	6	PE-BTC 851	Construction Productivity & Cost analysis
	7	PE-BTC 852	Contracts Management
Transportation and Geo-Tech	8	PE-BTC 861	Conventional and Nonconventional Materials in Highways
	9	PE-BTC862	Soil Dynamics

Open Elective-III

Sr. No.	Code	Elective
1	OE-BTC 811	Mechanics of water waves
2	OE-BTC 812	Human Resource Development& Organizational Behavior
3	OE-BTC 813	Watershed Development & Management
4	OE-BTC814	Disaster Management and preparedness
5	OE-BTE801	Robotics
6	OE-BTE802	Power Plant Engineering
7	OE-BTE803	Electrical engineering materials
8	OE-BTE804	Medical Electronics
9	OE-BTE805	Image processing
10	OE-BTM712	Introduction to Research Methodology
11	OE-BTM719	Value Engineering

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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
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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 Professional elective V and VI and the list of elective courses being offered by department will be displayed at the beginning of semester.
9. 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 **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 .
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Table GATE-MAP: Alignment of Course Content with GATE Syllabus (2022)

B.Tech. in Civil Engineering

No.	Section	Core courses in SPCE Curriculum 2021-22	Topics From GATE Syllabus (2022)
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