SANJIVANI RURAL EDUCATION SOCIETY'S

SANJIVANI COLLEGE OF ENGINEERING KOPARGAON-423603

(An Autonomous Institute Affiliated to SPPU Pune)

DEPARTMENT OF CIVIL ENGINEERING

COURSE STRUCTURE and SYLLABUS- 2019PATTERN

Profile: Sanjivani College of Engineering was established in the year 1983. The Civil Engineering Department is a part of the institute since its inception. The Department has grown over the years with qualified teaching faculty members who are passionate to impart quality education. The department laboratories are fully equipped with latest equipment, software and with all necessary teaching aids. It is now recognized as one of the prominent departments and known for academic excellence under the Pune University. The department is having valid Accreditation by 'NBA' from 31 July 2015 to 31 June 2021. Besides high quality teaching and instruction at UG, PG and Ph. D., the department is actively involved in basic and applied research and consultancy services. The department is providing quality technical and advisory support through consultancy to various private construction agencies, State Government, Central Government projects.

Apart from academic knowledge, we also, train our students to face the challenges in their profession by providing value added courses like Communication and Presentation skills, building of Team Sprit through field study, expert talk etc. The department also, provides an opportunity to learn software like AUTOCAD, REVIT ARCHITECTURE, STAD- PRO, ETAB, MS-PROJECT etc. to make our students more digitalized.

We arrange regular interaction of our stake holders like students, parents and faculty along with a Training and Placement cell which works full time for bright future of our students. The results are consistently above 90% and considerable number of student ranks in SPPU merit list. Students from Civil department have made incredible mark national and international levels and we are sure will continue in times to come.

The Infrastructure development in India is growing at a faster rate and there are many career paths for civil engineers. Civil engineers are essential in government sector, public and private sector and Multinational companies, to build various mega projects like highways, Industrial structures, smart cities, and reservoirs etc. The next decade will be most demanding and rewarding for Civil engineers.

SANJIVANI COLLEGE OF ENGINEERING, KOPARGAON Approved

Civil Engineering Department

VISION

- To become a premier source of competent Civil Engineering Professionals for providing service to the Nation.
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MISSION

- To provide quality education in Civil Engineering profession.
- To impart knowledge to students for socio-economic growth of India.
- To promote Civil Engineering Graduates to become an entrepreneur.
- To motivate Civil Engineering Professionals towards competitive services, higher studies and research.

Program Educational Objectives: (PEOs)

PEO 1: Excellence in civil engineering profession by acquiring knowledge of advanced civil engineering technologies.

PEO 2: Capable to identify, analyze and design solutions for civil engineering problems in context of social, environmental , ethical and economic growth of the nation

PEO 3: To improve their technical and professional skills through value addition programs, software's to develop a long term productive career in industry, Govt Services or an enterpreur.

Program Outcomes (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific outcomes: (PSOs)

PSO1: Graduates will be able to model, analyze and design Civil Engineering Infrastructures using modern tools and technologies.

PSO2: Graduates will be able to identify and provide innovative and sustainable solutions to water, soil, and environmental problems needs including construction planning, project managements and Transportation systems.

F.Y. B. TECH. GROUPWISE SUBJECT OFFFERD

SEMESTER-I

Group-A (Mechanical, Civil)		Group- B (Computer, IT, ETC, Electrical)	
Subject code	**Name of the subject**	**Subject code**	**Name of the subject**
LA101	Linear Algebra and Stochastic Processes	LA101	Linear Algebra and Stochastic Processes
EP102	Engineering Physics	EC103	Engineering Chemistry
CF105	Computer Fundamentals and Programming	BE104	Basic Electrical and Electronics Engineering
EM110	Engineering Mechanics	EG106	Engineering Graphics
BM108	Basic Mechanical Engineering and Workshop Practice	CS107	Communication Skills
PE111	Physical Education and Sport-I	PE111	Physical Education and Sport-I

SEMESTER-II

Group-A (Mechanical, Civil)		Group- B (Computer, IT, ETC, Electrical)	
Subject code	**Name of The subject**	**Subject code**	**Name of The subject**
MC109	Multivariate Calculus	MC109	Multivariate Calculus
EC103	Engineering Chemistry	EP102	Engineering Physics
BE104	Basic Electrical and Electronics Engineering	CF105	Computer Fundamentals and Programming
EG106	Engineering Graphics	EM110	Engineering Mechanics
CS107	Communication Skills	BM108	Basic Mechanical Engineering and Workshop Practice
PE112	Physical Education and Sport-II	PE112	Physical Education and Sport-II
ES113	Environmental Science	ES113	Environmental Science

SANJIVANI COLLEGE OF ENGINEERING, KOPARGAON
Approved

F.Y. B. TECH. COURSE STRUCTURE-2019

SEMESTER-I : 2019-20

Course Type	Course Code	Course Title	Course type	Teaching Scheme			Credits	Max marks				
				L (hrs.)	T (hrs.)	P (hrs.)		TW	TA	ISE	ESE	Total
BSC	LA101	Linear Algebra and Stochastic Processes	TH	4	1	--	5	25	10	30	60	125
BSC	**EP102** / EC103	**Engineering Physics**/ Engineering Chemistry	TH	3	--	2	4	25	10	30	60	125
EFC	**CF 105**/ BE104	**Computer Fundamentals and Programming** /Basic Electrical and Electronics Engineering	TH	3	--	2	4	25	10	30	60	125
EFC	**EM110** / EG106	**Engineering Mechanics**/ Engineering Graphics	TH	3	--	2	4	25	10	30	60	125
HSMC/ EFC	**BM108** / CS107	**Basic Mechanical Engg and Workshop Practice** / Communication Skills	TH	2	--	2	3	25	05	15	30	75
HSMC	PE111	Physical Education and Sport –I	TH	1	--	2	2	50	--	--	--	50
IP		Induction Program	--	--	--	--	--	--	--	--	--	--
		Total		**16**	**1**	**10**	**22**	**175**	**45**	**135**	**270**	**625**

SEMESTER-II : 2019-20

Course Type	Course Code	Course Title	Course type	Teaching Scheme			Credits	Max marks				
				L (hrs	T (hrs)	P (hrs)		TW	TA	ISE	ESE	Total
BSC	MC09	Multivariate Calculus	TH	4	1	--	5	25	10	30	60	125
BSC	**EC103** / EP102	**Engineering Chemistry**/ Engineering Physics	TH	3	--	2	4	25	10	30	60	125
EFC	**BE104** / CF105	**Basic Electrical and Electronics Engineering**/Computer Fundamentals and Programming	TH	3	--	2	4	25	10	30	60	125
EFC	**EG106** / EM110	**Engineering Graphics** / Engineering Mechanics	TH	3	--	2	4	25	10	30	60	125
EFC/ HSMC	**CS107**/ BM108	**Communication Skills**/ Basic mechanical Engg. and Workshop Practice	TH	2	--	2	3	25	05	15	30	75
HSMC	PE112	Physical Education and Sport -II	TH	1		2	2	50	--	--	--	50
MLC	ES113	Environmental Science	TH	2	--	--		--	--	--	--	--
		Total		**18**	**1**	**10**	**22**	**175**	**45**	**135**	**270**	**625**

Group A: Mechanical, Civil (06 Divisions)
Group B: Computer, IT, ETC, Electrical (05 Divisions)

SANJIVANI COLLEGE OF ENGINEERING, KOPARGAON
Approved

COURSE STRUCTURE and SYLLABUS- 2019 PATTERN

SECOND YEAR B. TECH.

(W.e.f June 2020)

Board of Studies in Civil Engineering, June 2020

LIST OF ABBREVIATIONS			
Abbreviation	**Full Form**	**Abbreviation**	**Full Form**
ESC	Engineering Science	HSC	Humanity Science
PCC	Professional Core	CIA	Continuous Internal Assessment
PEC	Professional Elective	OR	Oral Examination
OE	Open Elective	PR	Practical Examination
ISE	In-Semester Evaluation	TW	Continuous Term work Evaluation
ESE	End-Semester Evaluation	MLC	Mandatory Learning Course
BSC	Basic Science Course	PRJ	Project/Seminar/Internship/Online Course

COURSE STRUCTURE and SYLLABUS- 2019 PATTERN

SECOND YEAR B. TECH.

SEMESTER-III

Cat	Code	Course Title	Hrs./Week			Credits	Evaluation Scheme-Marks						
			L	T	P		Theory			OR	PR	TW	Total
							ISE	ESE	CIA				
PRJ	CE201	Professional Externship-I	-	-	-	2	-	-	-	50	-	-	50
BSC	BS202	Vector Calculus and Differential Equation	3	1	-	4	30	50	20	-	-	-	100
PCC	CE203	Solid Mechanics	4	-	-	4	30	50	20	-	-	-	100
PCC	CE204	Surveying	3	-	-	3	30	50	20	-	-	-	100
PCC	CE205	Building Technology and Materials	3	-	-	3	30	50	20	-	-	-	100
HSC	HS206	Universal Human Values and Ethics	3	-	-	3	30	50	20	-	-	-	100
PCC	CE207	Solid Mechanics Lab	-	-	2	1	-	-	-	50	-	25	75
PCC	CE208	Surveying Lab	-	-	2	1	-	-	-	-	50	-	50
PCC	CE209	Building Technology and Materials Lab	-	-	2	1	-	-	-	50	-	25	75
MLC	MC210	Mandatory Course - III	2	-	-	No Credits	-	-	-	-	-	-	-
		Total	**18**	**01**	**06**	**22**	**150**	**250**	**100**	**150**	**50**	**50**	**750**

SANJIVANI COLLEGE OF ENGINEERING KOPARGAON
Approved

SECOND YEAR B. TECH.

(W.e.f June 2020)

Board of Studies in Civil Engineering, June 2020

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SEMESTER-IV

Cat	Code	Course Title	Hrs./Week			Credits	Evaluation Scheme-Marks						
			L	T	P		Theory			OR	PR	TW	Total
							ISE	ESE	CIA				
PCC	CE211	Computational Techniques	3	-	-	3	30	50	20	-	-	-	100
PCC	CE212	Concrete Technology	3		-	3	30	50	20	-		-	100
PCC	CE213	Geotechnical Engineering	4	-	-	4	30	50	20	-	-	-	100
PCC	CE214	Analysis of Structures	3	1	-	4	30	50	20	-	-	-	100
PCC	CE215	Computer Aided Architectural building drawing	1	-	4	3	-	-	-	-	50	50	100
PCC	CE216	Computational Techniques Lab	-	-	2	1	-	-	-	-	-	50	50
PCC	CE217	Concrete Technology Lab	-	-	2	1	-	-	-	50	-	25	75
PCC	CE218	Geotechnical Engg. Lab	-	-	2	1	-	-	-	-	50	25	75
PRJ	CE219	Seminar	-	-	4	2	-	-	-	25	-	25	50
MLC	MC220	Mandatory Course-IV	2	-	0	No Credits	-	-	-	-	-	-	-
		Total	16	1	14	**22**	120	200	80	75	100	175	**750**

MC210	**Mandatory Course-III**	**Constitution of India – Basic features and fundamental principles**
MC220	**Mandatory Course-IV**	**Innovation - Project based – Sc., Tech, Social, Design & Innovation**

COURSE STRUCTURE and SYLLABUS- 2019 PATTERN

THIRD YEAR B. TECH.

(W.e.f June 2021)

Board of Studies in Civil Engineering, June 2021

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SEMESTER-V

Cat	Code	Course Title	Hrs./Week			Credits	Marks						
							Theory			OR	PR	TW	Total
			L	T	P		ISE	ESE	CIA				
PRJ	CE301	Professional Internship -II	-	-	-	2	-	-	-	50	-	-	50
PCC	CE302	Design of Steel Structures	4	-	-	4	30	50	20	-	-	-	100
PCC	CE303	Fluid Mechanics	3		-	3	30	50	20	-	-	-	100
PCC	CE304	Project Management and Economics	3	-	-	3	30	50	20	-	-	-	100
PCC	CE305	Engineering Geology	3	-	-	3	30	50	20	-	-	-	100
PEC	PE306	Professional Elective-I	3	-	-	3	30	50	20	-	-	-	100
PCC	CE307	Design of Steel Structures	-	-	2	1	-	-	-	50	-		50
PCC	CE308	Fluid Mechanics	-	-	2	1	-	-	-	50		-	50
PCC	CE309	Engineering Geology	-	-	2	1	-	-	-	-	50	--	50
PRJ	CE310	Skill based credit course	-	-	2	1			-			50	50
MLC	MC311	Mandatory Course-V: (Field Practices in Civil Engineering)	(1)	-	-	Non Credit	-	-	-	-	-	-	-
		Total	**17**	**---**	**08**	**22**	**150**	**250**	**100**	**150**	**50**	**50**	**750**

COURSE STRUCTURE and SYLLABUS- 2019 PATTERN

THIRD YEAR B. TECH.

(W.e.f June 2021)

Board of Studies in Civil Engineering, June 2021

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SEMESTER-VI

Cat	Code	Course Title	Hrs./Week			Credits	Marks						
			L	T	P		Theory			OR	PR	TW	Total
							ISE	ESE	CIA				
PCC	CE312	Hydrology and Water Resource Engineering	3	-	-	3	30	50	20	-	-	-	100
PCC	CE313	Design of Reinforced Concrete Structures	3	-	-	3	30	50	20	-	-	-	100
PEC	PE314	Professional Elective-II	3	-	-	3	30	50	20	-	-	-	100
OE	CE315	Open Elective-I	4	-	-	4	30	50	20	-	-	-	100
PRJ	PR316	IPR and EDP	2	-	-	2	15	25	10	-	-	-	50
PRJ	PR317	IPR and EDP Lab	-	-	2	1	-	-	-	-	-	50	50
HSMC	HS318	Corporate Readiness	1	-	2	2	-	-	-	-	-	50	50
PCC	CE319	Hydrology and Water Resource Engineering Lab	-	-	2	1	-	-	-	50	-	-	50
PCC	CE320	Design of Reinforced Concrete Structures Lab	-	-	2	1	-	-	-	50	-	-	50
MLC	MC321	Mandatory Course-VI: (Formwork in Constructions)	(1)	-	-	No Credits	-	-	-	-	-	-	-
		Total	**17**	**-**	**08**	**20**	**135**	**225**	**90**	**100**	**-**	**100**	**650**

FINAL YEAR B. TECH.

(W.e.f July 2022)

Board of Studies in Civil Engineering, June 2022

LIST OF ABBREVIATIONS			
Abbreviation	**Full Form**	**Abbreviation**	**Full Form**
ESC	Engineering Science	HSC	Humanity Science
PCC	Professional Core	CA	Continuous Assessment
PEC	Professional Elective	OR	Oral Examination
OEC	Open Elective	PR	Practical Examination
ISE	In-Semester Evaluation	TW	Continuous Term work Evaluation
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BSC	Basic Science Course	PRJ	Project/Seminar/Internship/Online Course

SEMESTER-VII

Cat	Code	Course Title	Teaching Scheme			Credits	Evaluation Scheme / Marks						
			Hrs./Week				Theory			OR	PR	TW	Total
			L	T	P		CIA	ISE	ESE				
PROJ	CE401	Professional Internship-III	-	-	-	2	-	-	-	50			50
PCC	CE402	Water and Waste Water Treatment	3	-	-	3	20	30	50	-	-	-	100
PCC	CE403	Dams and Hydraulic Structures	3	-	-	3	20	30	50	-	-	-	100
PEC	PE404	Professional Elective-III	3	-	-	3	20	30	50	-	-	-	100
OEC	OE405	Open Elective-II	-	-	-	3	25	-	75	-	-	-	100
OEC	OE406	Open Elective-III (Online through MOOCs)	3	-	-	2	20	-	30	-	-	-	50
PCC	CE407	Water and Waste Water Treatment Lab	-	-	2	1	-	-	-	50	-	-	50
PCC	CE408	Dams and Hydraulic Structures Lab	-	-	2	1	-	-	-	50	-	-	50
PRJ	CE409	Project Stage-I	-	-	4	2	-	-	-	50	-	-	50
MLC	MC410	Mandatory Learning	(1)	-	-	Non-	-	-	-	-	-	-	-

		Course				Credit							
		Total	**13**	**-**	**08**	**20**	**105**	**90**	**255**	**200**	**-**	**-**	**650**

Open Elective: II (OE405) Through NPTEL Platform

1) Introduction to multimodal urban transportation Systems

2) Advanced Geomatics Engineering

Open Elective: III (OE406) : Through MOOCS Coursera Platform

1) BIM fundamentals for Engineers

2) Introduction to GIS Mapping

3) Introduction to Sustainability

Professional Elective: 03 (CE404):

1. Design of Advance Concrete Structures
2. Air and Noise pollution and Control
3. Advanced Engineering Geology with Rock Mechanics
4. System Approach in Civil Engineering

FINAL YEAR B. TECH. SEM-II

(W.e.f July 2022)

Board of Studies in Civil Engineering, June 2022

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SEMESTER-VIII

Course		Course Title	Teaching Scheme			Credits	Evaluation Scheme / Marks						
			Hrs /Week				Theory			OR	PR	TW	Total
Cat	Code		L	T	P		CIA	ISE	ESE				
PCC	CE411	Highway Engineering	3	-	-	3	20	30	50	-	-	-	100
PCC	CE412	Quantity Survey, Contracts and Tenders	3	-	-	3	20	30	50	-	-	-	100
PCC	CE413	Construction Management	3	-	-	3	20	30	50	-	-	-	100
PEC	PE414	Professional Elective-IV	3	-	-	3	20	30	50	-	-	-	100
PCC	CE415	Highway Engineering Lab	-	-	2	1	-	-	-	-	-	50	50
PCC	CE416	Quantity Survey, Contracts and Tenders Lab	-	-	2	1	-	-	-	50	-	-	50
PRJ	CE417	Project Stage-II	-	-	8	4	-	-	-	50	-	100	150
MLC	MC418	Mandatory Course-VII – Energy Studies	1	-	-	-	-	-	-	-	-	-	-
		Total	**13**	**-**	**12**	**18**	**80**	**120**	**200**	**100**	**-**	**150**	**650**

PEC-CE414- Professional Elective-IV

1. Design of Earthquake Resistance Buildings
2. Metro Construction Technology
3. Solid Waste Management
4. Rehabilitation and Strengthening of Structur