Bansilal Ramnath Agarwal Charitable Trust's

Vishwakarma Institute of Information Technology, Pune-48

(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Syllabus for

Final Year - B. Tech.

Civil Engineering (Pattern 2020R1)

Department of Civil Engineering

Vision:

To be a Leading Centre of Education in Civil Engineering through Holistic Development

Mission:

M1: Develop competent Civil Engineers by imparting practical skills imbibed with ethical and societal values.

M2: Provide holistic education empowering students to address real-world challenges in Civil Engineering.

M3: Equip graduates with necessary knowledge and skills to pursue research, higher studies, entrepreneurship.

PROGRAM EDUCATIONAL OBJECTIVES

PEO 1: Graduates will have successful career in the field of Civil Engineering

PEO 2: Graduates will respond to growing demands of society through professional and ethical practices

PEO 3: Graduates will pursue lifelong learning including higher studies in the field of Civil Engineering

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 needfor 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 (PSO):

PSO1: Engineering graduates will be able to plan and execute the activities of construction projects

PSO2: Engineering graduates will be able to analyze and design components of Civil Engineering Systems.

FINAL YEAR B. TECH (CIVIL ENGINEERING), SEMESTER VII (PATTERN 2020R1) MODULE-I

Course Code	Course	Course Type	Teaching Scheme			Assessment Scheme										Credits
						ISA						ESA			Total	
			L	T	P	HA	TW	SCE	PPT	GD	CIE	ESE	Prac Exam	OR		
CVUA40201	Highway Engineering	TH	2	-	-	20		20			20	40		-	100	2
CVUA40202	Professional Elective-III	TH	2	-	-	20		20			20	40		-	100	2
IOEUA40203	Open Elective-II	TH	2	-	-	20		20			20	40		-	100	2
IOEUA40204	Open Elective-III	TH	2	-	-	20		20			20	40		-	100	2
CVUA40205	Design of Prestressed Concrete Structures	TH	2	-	-	20		20			20	40		-	100	2
CVUA40206	Major Project	CE-PR/OR	-	-	20		100					-	-	50	150	10
M4	Mandatory Course	AU	-	-	-							-	-	-	-	-
	Total	-	10	-	20	100	100	100			100	200		50	650	20

Professional Elective – III:

1. CVUA40202A: Earthquake Engineering
2. CVUA40202B: Air Pollution and Control
3. CVUA40202C: Advanced Foundation Engineering

Open Elective -II	Open Elective -III
IOEUA40203A: Introduction to Industry 4.0 and Industrial IOT	IOEUA40204A: Social Media Analytics
IOEUA40203B: Software Testing and Quality Assurance	IOEUA40204B: Organizational Behavior
IOEUA40203C : Data Centric AI	IOEUA40204C : Data Ethics
IOEUA40203G : Design Thinking and Innovation	IOEUA40204D : Business Intelligence
IOEUA40203I : Project Planning and Management	IOEUA40204E : Business Analytics
IOEUA40203H : Renewable Energy	IOEUA40204F : Project management and Economics

BoS Chairman **Dean Academics** **Director**

FINAL YEAR B. TECH (CIVIL ENGINEERING), SEMESTER VII (PATTERN 2020)

MODULE-II

Course Code	Course Title	Course Type	Teaching Scheme			Examination Scheme					Total	Credits
			L	T	P	CIE	ISE	SCE	ESE	PR/ OR/ TW		
CVUA40207	Semester Internship (Research / Industry)	CE-PR/OR	-	-	20	100	-	-	-	50	150	10
M4	Mandatory Course	AU	-	-	-	-	-	-	-	-	-	-
					20	100	-	-	-	50	150	10

Mandatory Course: Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Traditional Knowledge, Online certification course (minimum two weeks).

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FINAL YEAR B. TECH (CIVIL ENGINEERING), SEMESTER VIII (PATTERN 2020)

MODULE-III

Course Code	Course Title	Course Type	Teaching Scheme			Examination Scheme					Total	Credits
			L	T	P	CIE	ISE	SCE	ESE	PR/ OR/ TW		
CVUA42201	Professional Elective IV*	TH	3	-	2	20	20	20	40	25	125	4
IOEUA42202	Open Elective IV*	TH	3	-	-	20	20	20	40	25	125	3
IOEUA42203	Open Elective V*	TH	3	-	-	20	20	20	40	25	125	3
M4	Mandatory Course	AU	-	-	-	-	-	-	-	-	-	-
	Total	-	9	-	2	60	60	60	120	75	375	10

***Course has Oral Exam**

Professional Elective-IV		**Open Elective-IV**		**Open Elective-V**	
CVUA42201A	Architectural Town planning	IOEUA42202A	Non-Destructive Techniques and Engineering Diagnosis	IOEUA42203A	Numerical Methods
CVUA42201B	Environmental Impact Assessment				
CVUA42201C	Advanced Design of RC Structures				

Mandatory Course: Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Traditional Knowledge, Online certification course (minimum two weeks).

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FINAL YEAR B. TECH (COMMON TO ALL PROGRAMS), SEMESTER VIII
(PATTERN 2020) MODULE IV

Course Code	Course Title	Course Type	Teaching Scheme			Examination Scheme					Total	Credits
			L	T	P	CIE	ISE	SCE	ESE	PR/ OR/ TW		
CVUA40207	Semester Internship (Research / Industry)	CE-PR/OR	-	-	20	100	-	-	-	50	150	10
M4	Mandatory Course	AU	-	-	-	-	-	-	-	-	-	-
					20	100	-	-	-	50	150	10

Mandatory Course: Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Traditional Knowledge, Online certification course (minimum two weeks).

BoS Chairman **Dean Academics** **Director**

Department of Civil Engineering

FINAL YEAR B. TECH (CIVIL ENGINEERING), SEMESTER VIII (PATTERN 2020)

MODULE-V

Course Code	Course	Course Type	Teaching Scheme			Examination Scheme					Total	Credits
			L	T	P	CIE	ISE	SCE	ESE	PR/ OR/ TW		
CVUA40201	Highway Engineering	TH	2	-	-	20	20	20	40	-	100	2
CVUA40202	Professional Elective-III	TH	2	-	-	20	20	20	40	-	100	2
IOEUA40203	Open Elective-II	TH	2	-	-	20	20	20	40	-	100	2
IOEUA 40204	Open Elective-III	TH	2	-	-	20	20	20	40	-	100	2
CVUA40205	Research Methodology and IPR	CE	2	-	-	-	-	50	-	-	50	2
CVUA40206	Major Project	CE-PR/OR	-	-	20	100	-	-	-	50	150	10
M4	Mandatory Course	AU	-	-	-	-	-	-	-	-	-	-
	Total	-	10	-	20	180	80	130	160	50	600	20

Professional Elective – III:

1. CVUA40202A: Design of Prestressed Concrete Structures
2. CVUA40202B: Air Pollution and Control
3. CVUA40202C: Advanced Foundation Engineering

Open Elective -II	Open Elective -III
IOEUA40203A: Introduction to Industry 4.0 and Industrial IOT	IOEUA40204A: Social Media Analytics
IOEUA40203B: Software Testing and Quality Assurance	IOEUA40204B: Organizational Behavior
IOEUA40203C : Data Centric AI	IOEUA40204C : Data Ethics
IOEUA40203D : Computer Vision	IOEUA40204D : Business Intelligence
IOEUA40203E : Project Management: Planning, Execution, Evaluation and Control	IOEUA40204E : Business Analytics
IOEUA40203F : Solar and Wind Energy	IOEUA40204F : Project management and Economics

NOTE: Students who will register for Module-I in Semester VII have to register either of Module-III or Module IV in Semester VIII. Students who will register for Module-II in Semester VII have to register for Module-V in Semester VIII.

BoS Chairman **Dean Academics** **Director**