AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR

&

VINAYAKA MISSION'S KIRUPANANDA VARIYAR ENGINEERING COLLEGE, SALEM

(Constituent Colleges of Vinayaka Mission's Research Foundation Deemed to be University)

NAAC Accredited

VINAYAKA MISSION'S RESEARCH FOUNDATION

(Deemed to be University under section 3 of the UGC Act 1956)

BACHELOR OF CIVIL ENGINEERING/TECHNOLOGY (BE / B.Tech.)

DEGREE PROGRAMME - FULL TIME

UNDER FACULTY OF ENGINEERING AND TECHNOLOGY

(Semester I to VIII)

REGULATIONS 2021

CHOICE BASED CREDIT SYSTEM (CBCS)

(FOR THE STUDENTS ADMITTED FROM 2021-22 ONWARDS)

AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR

&

VINAYAKA MISSION'S KIRUPANANDA VARIYARENGINEERING COLLEGE, SALEM

Department of Civil Engineering

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	Graduates will perform as professional engineers in the various fields of Civil engineering.
PEO 2	Graduates will perform well in their specialized field and also trained in teamwork and leadership positions
PEO 3	Graduates will pursue lifelong learning in their specialized fields of Civil Engineering
PEO 4	Graduates will exhibit entrepreneurship qualities.
PEO 5	Graduates will contribute to the development of the profession, nation andsociety

PROGRAM SPECIFIC OUTCOMES (PSOs)

To achieve the mission of the program, Civil Engineering graduates will be able:

PSO 1	To work independently as well as in team to formulate, design, execute solutions for engineering problems and also analyze, synthesize technical data for application to product, process, system design & development
PSO 2	To understand & contribute towards social, environmental issues, following professional ethics and codes of conduct and embrace lifelonglearning for continuous improvement
PSO 3	To develop expertise towards use of modern engineering tools, careers in industries and research and demonstrate entrepreneurial skill

PROGRAMME OUTCOMES

Engineering Graduates will be able to:

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science,engineering fundamentals, and an engineering specialization to the solution ofcomplex engineering problems
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyzecomplex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 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.
PO 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.
PO 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.
PO 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.
PO 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.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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.
PO11	**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.
PO12	**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.

Vinayaka Mission's Research Foundation -Deemed to be University

Faculty of Engineering & Technology

Aarupadai Veedu Institute of Technology, Chennai
& Vinayaka Missions Kirupananda Variyar Engineering College, Salem

B.E. - Choice Based Credit System - 2021 - 2022 onwards

Regulation: R 2021

Name of the Board: Civil Engineering

Name of the Program: B.E. – Civil Engineering (Full Time - Regular)

STRUCTURE OF UNDERGRADUATE ENGINEERING PROGRAM – REGULAR STUDENTS

Sl. No.	Category of Course	Types of Courses		Breakup of Credits
1	A. Foundation Courses	Humanities and Social Sciences including Management courses		9-12
2		Basic Science courses		18-25
3		Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.		18-24
4	B. Professional Courses	Core courses		48-54
5	C. Elective Courses	Professional Electives		12
6		Industry Designed / Industry supported / Industry offered/Industry Sponsored Courses		6
7		Open Electives	Innovation, Entrepreneurship, Skill Development etc.	6-9
			Emerging Areas like 3D Printing, Artificial Intelligence, Internet of Things etc.	6-9
8	D. Courses for presentation of technical skills related to the specialization	Project work		8
		Mini Project		3
		Seminar		1
		Internship		3
9	E.**Mandatory Courses	Mandatory Courses [Gender Equity and Law, Indian Constitution, Essence of Indian Traditional Knowledge,Employability Enhancement courses, Yoga and Meditation,NCC, NSS, RRC, YRC, Rotaract, Sports and Games, Science Clubs, Arts Clubs, Unnat Bharat Abhiyan, Swachh Bharat etc.]		Zero credit course (Min. 2 courses to becompleted)
		Credits to be earned		160
** Credits earned under this category will not be considered for CGPA calculation				

A. Foundation Courses									
Humanities and Social Sciences including Management Courses –Credits (9 - 1 2)									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		TECHNICAL ENGLISH	ENG	FC-HS	3	0	0	3	NIL
2.		BUSINESS ENGLISH	ENG	FC-HS	3	0	0	3	NIL
3.		ENGLISH LANGUAGE LAB	ENG	FC-HS	0	0	4	2	NIL
4.		UNIVERSAL HUMAN VALUES – UNDERSTANDING HARMONY	ENG	FC-HS	3	0	0	3	NIL
5.		TOTAL QUALITY MANAGEMENT	MANAG	FC-HS	3	0	0	3	NIL
6.		ENGINEERING MANAGEMENT AND ETHICS	MANAG	FC-HS	3	0	0	3	NIL

Basic Science Courses –Credits (18-25)									
S.No	**CODE**	**COURSE**	**OFFERIN GDEPT.**	**CATEGOR Y**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		ENGINEERING MATHEMATICS	MATH	FC-BS	2	1	0	3	NIL
2.		MATHEMATICS FOR CIVIL ENGINEERS	MATH	FC-BS	2	1	0	3	ENGINEERING MATHEMATICS
3.		PROBABILITY AND STATISTICS	MATH	FC-BS	2	1	0	3	NIL
4.		NUMERICAL METHODS	MATH	FC-BS	2	1	0	3	ENGINEERING MATHEMATICS
5.		PHYSICAL SCIENCES	PHY & CHEM	FC-BS	4	0	0	4	NIL
6.		SMART MATERIALS	PHY	FC-BS	3	0	0	3	PHYSICAL SCIENCES
7.		PHYSICAL SCIENCES LAB	PHY & CHEM	FC-BS	0	0	4	2	NIL
8.		GREEN BUILDING MATERIALS	CHEM	FC-BS	3	0	0	3	NIL
9.		ENVIRONMENTAL SCIENCES	CHEM	FC-BS	3	0	0	3	NIL

Engineering Science courses including Workshop, Drawing, Basics of Electrical/Mechanical/Computer etc., - Credits – (18-24)									
S.No.	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		FOUNDATIONS OF COMPUTING AND PROGRAMMING (THEORY AND PRACTICALS)	CSE	FC-ES	2	0	2	3	NIL
2.		PYTHON PROGRAMMING (THEORY AND PRACTICALS)	CSE	FC-ES	2	0	2	3	NIL
3.		BASICS OF CIVIL AND MECHANICAL ENGINEERING	CIVIL & MECH	FC-ES	4	0	0	4	NIL
4.		BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	EEE & ECE	FC-ES	4	0	0	4	NIL
5.		ENGINEERING SKILLS PRACTICALS LAB	CIVIL & MECH	FC-ES	0	0	4	2	NIL
6.		BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB	EEE &ECE	FC-ES	0	0	4	2	NIL
7.		ENGINEERING MECHANICS	MECH	FC-ES	2	1	0	3	NIL
8.		ENGINEERING GRAPHICS AND DESIGN	MECH	FC-ES	0	0	6	3	NIL

B. Professional									
Core Courses-Credits (48-54)									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1		DESIGN OF REINFORCED CONCRETE ELEMENTS	CIVIL	CC	2	1	0	3	STRENGTH OF MATERIALS
2		CONSTRUCTION MATERIALS AND TECHNIQUES (THEORY AND PRACTICALS)	CIVIL	CC	3	0	2	4	NIL
3		STRENGTH OF MATERIALS	CIVIL	CC	2	1	0	3	NIL
4		FLUIDS MECHANICS AND HYDRAULIC ENGINEERING	CIVIL	CC	2	1	0	3	NIL
5		ENGINEERING SURVEYING (THEORY AND PRACTICALS)	CIVIL	CC	2	1	4	5	NIL
6		ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)	CIVIL	CC	2	1	2	4	NIL
7		DESIGN OF REINFORCED CONCRETE STRUCTURES	CIVIL	CC	2	1	0	3	DESIGN OF REINFORCED CONCRETE ELEMENTS
8		STRUCTURAL ANALYSIS	CIVIL	CC	2	1	0	3	STRENGTH OF MATERIALS

9		MODERN METHODS OF STRUCTURAL ANALYSIS	CIVIL	CC	2	1	0	3	STRUCTURAL ANALYSIS
10		GEOTECHNICAL ENGINEERING (THEORY AND PRACTICALS)	CIVIL	CC	2	1	4	5	NIL
11		DESIGN OF STEEL STRUCTURES	CIVIL	CC	2	1	0	3	STRENGTH OF MATERIALS
12		TRANSPORTATION ENGINEERING	CIVIL	CC	3	0	0	3	NIL
13		ESTIMATION COSTING AND VALUATION	CIVIL	CC	2	1	0	3	NIL
14		COMPUTER AIDED BUILDING DRAWING LAB	CIVIL	CC	0	0	4	2	NIL
15		STRENGTH OF MATERIALS LAB	CIVIL	CC	0	0	4	2	NIL
16		HYDRAULIC ENGINEERING LAB	CIVIL	CC	0	0	4	2	NIL
17		CONCRETE AND CONSTRUCTION TECHNOLOGY LAB	CIVIL	CC	0	0	4	2	CONSTRUCTION MATERIALS AND TECHNIQUES (THEORY AND PRACTICALS)
18		SURVEY CAMP	CIVIL	CC	0	0	2	1	ENGINEERING SURVEYING

C. Elective Courses

Professional Electives- Credits (12)

S.No	CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1		IRRIGATION ENGINEERING	CIVIL	EC-PS	3	0	0	3	ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)
2		ENGINEERING GEOLOGY	CIVIL	EC-PS	3	0	0	3	NIL
3		REMOTE SENSING AND GIS	CIVIL	EC-PS	3	0	0	3	NIL
4		REPAIR AND REHABILITATION OF STRUCTURES	CIVIL	EC-PS	3	0	0	3	CONSTRUCTION MATERIALS AND TECHNIQUES (THEORY AND PRACTICALS)
5		TRAFFIC ENGINEERING AND MANAGEMENT	CIVIL	EC-PS	3	0	0	3	TRANSPORTATION ENGINEERING
6		HYDROLOGY	CIVIL	EC-PS	3	0	0	3	NIL
7		DISASTER MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
8		HOUSING PLANNING AND MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
9		GROUND IMPROVEMENT TECHNIQUES	CIVIL	EC-PS	3	0	0	3	GEOTECHNICAL ENGINEERING (THEORY AND PRACTICALS)

10		ELECTRONIC SURVEYING	CIVIL	EC-PS	3	0	0	3	ENGINEERING SURVEYING (THEORY AND PRACTICALS)
11		AIR POLLUTION MANAGEMENT	CIVIL	EC-PS	3	0	0	3	ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)
12		BRIDGE STRUCTURES	CIVIL	EC-PS	3	0	0	3	DESIGN OF STEEL STRUCTURES
13		TALL BUILDINGS	CIVIL	EC-PS	3	0	0	3	DESIGN OF STEEL STRUCTURES
14		STRUCTURAL DYNAMICS	CIVIL	EC-PS	3	0	0	3	STRUCTURALANALYSIS
15		WIND ENGINEERING	CIVIL	EC-PS	3	0	0	3	NIL
16		INDUSTRIAL STRUCTURES	CIVIL	EC-PS	3	0	0	3	DESIGN OF STEEL STRUCTURE
17		FINITE ELEMENT TECHNIQUES	CIVIL	EC-PS	3	0	0	3	STRUCTURALANALYSIS
18		GROUND WATER ENGINEERING	CIVIL	EC-PS	3	0	0	3	ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)
19		CONTRACT LAWS AND REGULATIONS	CIVIL	EC-PS	3	0	0	3	NIL
20		SOLID WASTE MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
21		WASTE WATER ENGINEERING	CIVIL	EC-PS	3	0	0	3	ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)
22		CONSTRUCTION PLANNING AND SCHEDULING	CIVIL	EC-PS	3	0	0	3	NIL
23		CONCRETE TECHNOLOGY	CIVIL	EC-PS	3	0	0	3	CONSTRUCTION MATERIALS AND TECHNIQUES (THEORY AND PRACTICALS)
24		PRESTRESSED CONCRETE	CIVIL	EC-PS	3	0	0	3	DESIGN OF REINFORCED CONCRETEELEMENTS
25		PREFABRICATED STRUCTURES	CIVIL	EC-PS	3	0	0	3	DESIGN OF STEEL STRUCTURES

Industry Designed/ Industry Supported/ Industry Offered/ Industry Sponsored courses –Credits (6)									
S.NO.	**COURSE CODE**	**COURSE**	**OFFERING INDUSTRY**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQ UISITES**
1.		BUILDING DESIGN WITH OPEN BUILDINGS DESIGNER PART 1	BENTLEY LEARNING PATH: OPEN BUILDING DESIGNER	EC-IE	3	0	0	3	NIL
2.		BUILDING DESIGN WITH OPEN BUILDINGSDESIGNER PART 2	BENTLEY LEARNING PATH: OPEN BUILDING DESIGNER	EC-IE	3	0	0	3	NIL

3.		AECOSIM BUILDING DESIGN	BENTLEY LEARNING PATH: OPEN BUILDING DESIGNER	EC-IE	3	0	0	3	NIL
4.		PROSTRUCTURES	BENTLEY LEARNING PATH: OPEN BUILDING DESIGNER	EC-IE	3	0	0	3	NIL
5.		SOFT SKILLS	INFOSYS	EC-IE	3	0	0	3	NIL
6.		GREEN BUILDINGS AND BUILT ENVIRONMENT	IGBC	EC-IE	3	0	0	3	NIL

Open Courses – Electives from Innovation, Entrepreneurship, Skill Development etc. Credits (6-9)

S.NO	COURSE CODE	COURSE	OFFERING INDUSTRY	CATEGORY	L	T	P	C	PREREQUISITES
1		INNOVATION, PRODUCT DEVELOPMENT AND COMMERCIALIZATION	MANAG	OE-IE	3	0	0	3	NIL
2		NEW VENTURE PLANNING AND MANAGEMENT	MANAG	OE-IE	3	0	0	3	NIL
3		SOCIAL ENTREPRENEURSHIP	MANAG	OE-IE	3	0	0	3	NIL
4		ENGINEERING STARTUPS AND ENTREPRENEURIAL MANAGEMENT	MANAG	OE-IE	3	0	0	3	NIL
5		INTELLECTUAL PROPERTY RIGHTS	MANAG	OE-IE	3	0	0	3	NIL

Open subjects –Electives from other Emerging Areas Credits (6-9)

S.NO	COURSE CODE	COURSE	OFFERING INDUSTRY	CATEGORY	L	T	P	C	PREREQUISITES
1.		GREEN POWER GENERATION SYSTEMS	EEE	OE-EA	3	0	0	3	NIL
2.		INDUSTRIAL DRIVES AND AUTOMATION	EEE	OE-EA	3	0	0	3	NIL
3.		PRINCIPLES OF BIOMEDICAL INSTRUMENTATION	BME	OE-EA	3	0	0	3	NIL
4.		BIOSENSORS AND TRANSDUCERS	BME	OE-EA	3	0	0	3	NIL
5.		INTRODUCTION TO BIOFUELS	BTE	OE-EA	3	0	0	3	NIL
6.		FOOD AND NUTRITION TECHNOLOGY	BTE	OE-EA	3	0	0	3	NIL
7.		FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE	CSE	OE-EA	3	0	0	3	NIL
8.		INTRODUCTION TO INTERNET OF THINGS	CSE	OE-EA	3	0	0	3	NIL

9.		CYBER SECURITY	CSE	OE-EA	3	0	0	3	NIL
10.		INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	ECE	OE-EA	3	0	0	3	NIL
11.		DESIGN OF ELECTRONIC EQUIPMENT	ECE	OE-EA	3	0	0	3	NIL
12.		3D PRINTING AND ITS APPLICATIONS	MECH	OE-EA	3	0	0	3	NIL
13.		INDUSTRIAL ROBOTICS	MECH	OE-EA	3	0	0	3	NIL
14.		BIOMOLECULES – STRUCTURE AND FUNCTION	PE	OE-EA	3	0	0	3	NIL
15.		PHARMACOGENOMICS	PE	OE-EA	3	0	0	3	NIL

Project Work,Seminar and Internship in Industry or elsewhere Credits -Credits (15)

S.No	CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1		PROJECT WORK	CIVIL	PI-P	0	0	16	8	NIL
2		MINI PROJECT	CIVIL	PI-M	0	0	6	3	NIL
3		SEMINAR	CIVIL	PI-S	0	0	2	1	NIL
4		INTERNSHIP	CIVIL	PI-I	3 WEEKS			3	NIL
TOTAL					0	0	30	15	

MANDATORY COURSES (NON CREDITS)

(Not Included for CGPA Calculations)

S.No	CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1.		YOGA AND MEDITATION	PHED	AC	0	0	2	0	NIL
Any Two of The Following Courses									
2.		INDIAN CONSTITUTION	LAW	AC	0	0	2	0	NIL
3.		ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	GEN	AC	0	0	2	0	NIL
4.		NCC/NSS/RRC/ /YRC/STUDENT CLUBS/UNNAT BHARAT ABHIYAN/SWATCH BHARAT	GEN	AC	0	0	2	0	NIL
5.		SPORTS AND GAMES	PHED	AC	0	0	2	0	NIL
6.		GENDER EQUITY AND LAW	LAW	AC	0	0	2	0	NIL

Specialization – Irrigation Engineering									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1		SURFACE AND GROUND WATER HYDROLOGY	CIVIL	EC-SE	3	0	0	3	NIL
2		ENVIRONMENTAL IMPACT ASSESSMENT OF IRRIGATION PROJECTS	CIVIL	EC-SE	3	0	0	3	IRRIGATION ENGINEERING
3		WATERSHED CONSERVATION AND MANAGEMENT	CIVIL	EC-SE	3	0	0	3	NIL
4		IRRIGATION SYSTEMS MANAGEMENT	CIVIL	EC-SE	3	0	0	3	IRRIGATION ENGINEERING
5		COMPUTATIONAL METHODS IN IRRIGATION MANAGEMENT	CIVIL	EC-SE	3	0	0	3	NIL
6		AGRICULTURAL ECONOMICS	CIVIL	EC-SE	3	0	0	3	NIL
7		MODERNIZATION OF IRRIGATION SYSTEMS	CIVIL	EC-SE	3	0	0	3	IRRIGATION ENGINEERING
8		IRRIGATION ENGINEERING DRAWING LABORATORY	CIVIL	EC-SE	0	0	4	2	NIL

Specialization – Mass Transport Systems									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1		ADVANCED SYSTEM DYNAMICS MODELING IN TRANSPORTATION ENGINEERING	CIVIL	EC-SE	3	0	0	3	NIL
2		ENVIRONMENTAL IMPACT ASSESSMENT OF TRANSPORTATION PROJECTS	CIVIL	EC-SE	3	0	0	3	NIL
3		INTELLIGENT TRANSPORTATION SYSTEMS	CIVIL	EC-SE	3	0	0	3	NIL
4		LOGISTICS IN TRANSPORTATION ENGINEERING	CIVIL	EC-SE	3	0	0	3	NIL
5		PAVEMENT MANAGEMENT SYSTEM	CIVIL	EC-SE	3	0	0	3	NIL
6		REMOTE SENSING AND GIS IN TRANSPORTATION DEVELOPMENT	CIVIL	EC-SE	3	0	0	3	NIL
7		URBAN TRANSPORTATION INFRASTRUCTURE– PLANNING AND DESIGN	CIVIL	EC-SE	3	0	0	3	NIL
8		CAD IN TRANSPORTATION ENGINEERINGLABORATORY	CIVIL	EC-SE	0	0	4	2	NIL

Specialization – Real Estate and Valuation

S.No	CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1		PRINCIPLES OF VALUATION	CIVIL	EC-SE	3	0	0	3	NIL
2		REAL ESTATE MANAGEMENT & ECONOMICS	CIVIL	EC-SE	3	0	0	3	NIL
3		REAL ESTATE HUMAN RESOURCE MANAGEMENT	CIVIL	EC-SE	3	0	0	3	NIL
4		LAWS FOR ACQUISITION ANDCONTRACT	CIVIL	EC-SE	3	0	0	3	NIL
5		REAL ESTATE FINANCE& MARKETING	CIVIL	EC-SE	3	0	0	3	NIL
6		VALUATION & DOCUMENTATION WRITING	CIVIL	EC-SE	3	0	0	3	NIL
7		QUALITY CONTROL AND ASSURANCE INREAL ESTATE	CIVIL	EC-SE	3	0	0	3	NIL
		ESTIMATING, COSTING AND PROFESSIONAL PRACTICE	CIVIL	EC-SE	0	0	4	2	NIL

Specialization – Sustainable Construction Technology

S.No	CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1		RENEWABLE ENERGY SYSTEMS	CIVIL	EC-SE	3	0	0	3	NIL
2		THERMAL INSULATION INSTALLATION	CIVIL	EC-SE	3	0	0	3	NIL
3		SUSTAINABLE URBAN SYSTEMS	CIVIL	EC-SE	3	0	0	3	NIL
4		ENERGY AUDITING IN SPECIAL STRUCTURES	CIVIL	EC-SE	3	0	0	3	NIL
5		LIFE CYCLE ASSESSMENT FOR COMPLEX SYSTEMS	CIVIL	EC-SE	3	0	0	3	NIL
6		INFRASTRUCTURE PROJECT DEVELOPMENT	CIVIL	EC-SE	3	0	0	3	NIL
7		GREEN BUILDING AND ENERGY EFFICIENT BUILDING	CIVIL	EC-SE	3	0	0	3	NIL
8		SUSTAINABLE BUILDING MATERIALLABORATORY	CIVIL	EC-SE	0	0	4	2	NIL

Specialization - Environmental Engineering									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1		ENVIRONMENTAL IMPACT ASSESSMENT	CIVIL	EC-SE	3	0	0	3	NIL
2		INSTRUMENTAL MONITORING OF ENVIRONMENT	CIVIL	EC-SE	3	0	0	3	NIL
3		INDOOR AIR QUALITY	CIVIL	EC-SE	3	0	0	3	NIL
4		ENVIRONMENTAL POLICIES AND LEGISLATIONS	CIVIL	EC-SE	3	0	0	3	NIL
5		SUSTAINABLE DEVELOPMENT AND ENVIRONMENT	CIVIL	EC-SE	3	0	0	3	NIL
6		REMOTE SENSING AND GIS FOR ENVIRONMENTAL APPLICATION	CIVIL	EC-SE	3	0	0	3	NIL
7		WASTE WATER MANAGEMENT	CIVIL	EC-SE	3	0	0	3	NIL
8		ENVIRONMENTAL ANALYSIS LABORATORY	CIVIL	EC-SE	0	0	4	2	NIL

Specialization –3D Printing									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1		3D PRINTING WITH SKETCHUP	CIVIL	EC-SE	3	0	0	3	NIL
2		MODERNISTIC APPROACHESIN BUILDING CONSTRUCTION	CIVIL	EC-SE	3	0	0	3	NIL
3		FUNDAMENTALS OF 3DPRINTING	CIVIL	EC-SE	3	0	0	3	NIL
4		NANO MATERIALS FOR 3DPRINTING	CIVIL	EC-SE	3	0	0	3	NIL
5		BIM AND 3D PRINTING OFCONCRETE	CIVIL	EC-SE	3	0	0	3	NIL
6		ADVANCED 3D PRINTING APPLICATION IN CONSTRUCTION	CIVIL	EC-SE	3	0	0	3	NIL
7		ADDITIVE MANUFACTURING TECHNIQUES	CIVIL	EC-SE	3	0	0	3	NIL
8		MEASUREMENT SCIENCE IN3D PRINTING	CIVIL	EC-SE	0	0	4	2	NIL