VINAYAKA MISSION'S RESEARCH FOUNDATION

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

FACULTY OF ENGINEERING AND TECHNOLOGY

REGULATIONS 2021

Programme:

BE / B.Tech. - CIVIL ENGINEERING (PART TIME)

3 ½ Years

CHOICE BASED CREDIT SYSTEM (CBCS)

CURRICULUM

(Semester I to VII)

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 of complex engineering problems
PO 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.
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./B.Tech. – Choice Based Credit System

2021 - 2022 onwards

Regulation: R2021

Name of the Board: Civil Engineering

Name of the Program: B.E./B.Tech. – Civil Engineering (Part-Time)

STRUCTURE OF UNDERGRADUATE ENGINEERING PROGRAM PART-TIME 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 (Maths, Physics & Chemistry)		9-12
3	**B. Professional**	Core courses		61
4	**C. Elective Courses**	Professional Electives		12-15
		Open Electives	Innovation Entrepreneurship, Skill Development	3-6
			Emerging Areas like 3D Printing, Artificial Intelligence, Internet of Things etc.	3-6
5	**D. Courses for presentation of technical skills related to the specialization**	Project work		8
6	**E.**MandatoryCourses**	Mandatory Courses [Gender Equity and Law, Indian Constitution, Essence of Indian Traditional Knowledge, 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 be completed)
Minimum Credits to be earned				105
**** Credits earned under this category will not be considered for CGPA calculation**				

A. Foundation Courses									
Humanities and Social Sciences including Management Courses –Credits (9-12)									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		UNIVERSAL HUMAN VALUES – UNDERSTANDING HARMONY	ENG	FC-HS	3	0	0	3	NIL
2.		TOTAL QUALITY MANAGEMENT	MANAG	FC-HS	3	0	0	3	NIL
3.		ENGINEERING MANAGEMENT AND ETHICS	MANAG	FC-HS	3	0	0	3	NIL
4.		OPERATIONS MANAGEMENT	MANAG	FC-HS	3	0	0	3	NIL

Basic Science Courses –Credits (9-12)									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**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.		SMART MATERIALS	PHY	FC-BS	3	0	0	3	PHYSICAL SCIENCES
6.		GREEN BUILDING MATERIALS	CHEM	FC-BS	3	0	0	3	NIL
7.		ENVIRONMENTAL SCIENCES	CHEM	FC-BS	3	0	0	3	NIL

B. Professional

Core Courses – Credits (61)

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		ENGINEERING MECHANICS	MECH	CC	2	1	0	3	NIL
19		CONSTRUCTION PLANNING AND SCHEDULING	CIVIL	CC	3	0	0	3	NIL

20		COMPUTER AIDED DESIGN AND DRAWING LAB	CIVIL	CC	0	0	4	2	NIL

C.Elective Courses									
Professional Elective courses Credits (12-15)									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1		REPAIR AND REHABILITATION OF STRUCTURES	CIVIL	EC-PS	3	0	0	3	CONSTRUCTION MATERIALS AND TECHNIQUES (THEORY AND PRACTICALS)
2		TRAFFIC ENGINEERING AND MANAGEMENT	CIVIL	EC-PS	3	0	0	3	TRANSPORTATION ENGINEERING
3		HYDROLOGY	CIVIL	EC-PS	3	0	0	3	NIL
4		DISASTER MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
5		HOUSING PLANNING AND MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
6		GROUND IMPROVEMENT TECHNIQUES	CIVIL	EC-PS	3	0	0	3	GEOTECHNICAL ENGINEERING (THEORY AND PRACTICALS)
7		AIR POLLUTION MANAGEMENT	CIVIL	EC-PS	3	0	0	3	ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)
8		TALL BUILDINGS	CIVIL	EC-PS	3	0	0	3	DESIGN OF STEEL STRUCTURES
9		STRUCTURAL DYNAMICS	CIVIL	EC-PS	3	0	0	3	STRUCTURAL ANALYSIS
10		WIND ENGINEERING	CIVIL	EC-PS	3	0	0	3	NIL
11		INDUSTRIAL STRUCTURES	CIVIL	EC-PS	3	0	0	3	DESIGN OF STEEL STRUCTURE
12		FINITE ELEMENT TECHNIQUES	CIVIL	EC-PS	2	1	0	3	STRUCTURAL ANALYSIS
13		GROUND WATER ENGINEERING	CIVIL	EC-PS	3	0	0	3	ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)
14		CONTRACT LAWS AND REGULATIONS	CIVIL	EC-PS	3	0	0	3	NIL
15		SOLID WASTE MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
16		WASTE WATER ENGINEERING	CIVIL	EC-PS	3	0	0	3	NIL
17		CONCRETE TECHNOLOGY	CIVIL	EC-PS	3	0	0	3	CONSTRUCTION MATERIALS AND TECHNIQUES (THEORY AND PRACTICALS)
18		PRESTRESSED CONCRETE	CIVIL	EC-PS	3	0	0	3	DESIGN OF REINFORCED CONCRETE ELEMENTS

19		ENGINEERING GEOLOGY	CIVIL	EC-PS	3	0	0	3	NIL
20		IRRIGATION ENGINEERING	CIVIL	EC-PS	3	0	0	3	ENVIRONMENTAL ENGINEERING AND DESIGN (THEORY AND PRACTICALS)

Open subjects –Electives from Innovation, Entrepreneurship, Skill Development etc. Credits (3-6)									
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 (3-6)									
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 - Credits (8)

S.No	CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1		PROJECTWORK	CIVIL	PI-P	0	0	16	8	NIL

MANDATORY COURSES (NO 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