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)

AICTE APPROVED & NAAC Accredited

VINAYAKA MISSION'S RESEARCH FOUNDATION

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

Faculty of Engineering and Technology

Department of Civil Engineering Programme:

M.E – Construction Engineering and Management

Part Time (3 Years)

CHOICE BASED CREDIT SYSTEM (CBCS)

Curriculum & Syllabus (Semester I to VI)

Regulations 2021

AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR
&
VINAYAKA MISSION'S KIRUPANANDA VARIYAR ENGINEERING COLLEGE, SALEM

Department of Civil Engineering

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	Graduates will perform as professional engineers in the field of Construction Engineering and Management.
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 the specialized fields of Construction Engineering and Management.
PEO 4	Graduates will exhibit entrepreneurship qualities.
PEO 5	Graduates will contribute to the development of the profession, nation and society

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 lifelong learning 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 MISSIONS RESEARCH FOUNDATIONS
FACULTY OF ENGINEERING AND TECHNOLOGY

CREDIT STRUCTURE FOR POST GRADUATE ENGINEERING PROGRAM
(M.E / M.TECH –PART TIME) -2021

S.No	Category of courses	Type of courses	Suggested break up of credits
1.	A. Foundation courses	Statistical Methods and Queuing Theory	3
		Research Methodology and IPR	2
2.	B. Program core courses	Core courses	32
3.	C. Elective courses	Program Electives	15
		Open Electives (Courses on Emerging Areas)	03
4.	D. Employability Enhancement Courses and courses for presentation of Technical skills related to the specialization	Project Work Phase I	06
		Project Work Phase II	12
		Technical Seminar	1
		Research Presentation Skills	1
5.	E. Audit courses	Any two courses on: 1. English for Research Paper Writing 2. Value Education 3. Constitution of India 4. Pedagogy Studies 5. Personality Development Through Life Enlighten Skills	Zero credit
Total credits to be earned for the award of M.E /M.Tech degree			**75**

CREDIT STRUCTURE FOR POST GRADUATE ENGINEERING PROGRAM (M.E / M.TECH – PART TIME) -2021

S.No	Category of courses	Type of courses	Suggested break up of credits	Course Title
1.	A.Foundation courses	Mathematics/ Applied Mathematics	3	Statistical Methods and QueuingTheory
		Research Methodology and IPR	2	Research Methodology and IPR
2.	B. Program core courses	Core courses	32	1. Construction Materials and ConcreteDesign 2. Project Formulation and Appraisal 3. Construction Planning, Schedulingand Control 4. Computer Applications in Construction Engineering andPlanning 5. Advanced Concrete Technology 6. Modernistic approaches inconstruction 7. Automation in ConstructionManagement 8. Advanced Project Management Concepts 9. Quality and safety in construction 10. Quantitative Techniques inConstruction Management 11. Quality Control and Assurance in Construction
3.	C. Elective courses	Program electives	15	1. Contract Laws and Regulations 2. System Integration in Construction 3. Energy efficient buildings 4. Construction economics and Financial Management 5. Construction Personnel Management 6. Business Economics and FinanceManagement 7. Resource Management and Control in Construction 8. Project Safety Management 9. Maintenance and Rehabilitation ofStructures
		Open electives (Courses on emerging areas)	03	1.Management Information System 2.Waste to Energy 3. Biomedical Product Design and Development 4.Advanced Cyber Security 5. Bio Mems 6. Solar and Energy Storage Systems 7.Operations Research 8. Metal Additive Manufacturing

4.	D. Employability Enhancement Courses and courses for presentation of Technical skills related to the specialization	Project work phase I	6	
		Project work phase II	12	
		Technical Seminar	1	
		Research Presentation Skills	1	
5.	E.Audit courses	Any two courses on: 1. English for Research Paper Writing 2. Value Education 3. Constitution of India 4. Pedagogy Studies 5. Personality Development Through Life Enlighten Skills	Zero credit	
Total credits to be earned for the award of M.E /M.Tech degree			**75**	

A. Foundation Courses - Credits (5)									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		STATISTICAL METHODS AND QUEUINGTHEORY	MATH	FC-BS	3	0	0	3	NIL
2.		RESEARCH METHODOLOGY AND IPR	CIVIL	FC-HS	2	0	0	2	NIL

B. Program core courses – Credits 32									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		CONSTRUCTION MATERIALS AND CONCRETE DESIGN	CIVIL	CC	3	1	0	4	NIL
2.		PROJECT FORMULATION AND APPRAISAL	CIVIL	CC	3	1	0	4	NIL
3.		CONSTRUCTION PLANNING, SCHEDULING AND CONTROL	CIVIL	CC	3	1	0	4	NIL
4.		COMPUTER APPLICATIONS IN CONSTRUCTION ENGINEERING AND PLANNING	CIVIL	CC	0	0	4	2	NIL
5.		ADVANCED CONCRETE TECHNOLOGY	CIVIL	CC	3	1	0	4	NIL
6.		MODERNISTIC APPROACHES IN CONSTRUCTION	CIVIL	CC	3	1	0	4	NIL
7.		AUTOMATION IN CONSTRUCTION MANAGEMENT	CIVIL	CC	3	0	0	3	NIL
8.		ADVANCED PROJECT MANAGEMENT CONCEPTS	CIVIL	CC	3	1	0	4	NIL
9.		QUALITY AND SAFETY IN CONSTRUCTION	CIVIL	CC	3	0	0	3	NIL
10.		QUANTITATIVE TECHNIQUES IN CONSTRUCTION MANAGEMENT	CIVIL	CC	3	0	0	3	NIL
11.		QUALITY CONTROL AND ASSURANCE IN CONSTRUCTION	CIVIL	CC	3	0	0	3	NIL

Elective courses									
Program electives – Credits 15									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		CONTRACT LAWS AND REGULATIONS	CIVIL	EC-PS	3	0	0	3	NIL
2.		SYSTEM INTEGRATION IN CONSTRUCTION	CIVIL	EC-PS	3	0	0	3	NIL
3.		ENERGY EFFICIENT BUILDINGS	CIVIL	EC-PS	3	0	0	3	NIL
4.		CONSTRUCTION ECONOMICS AND FINANCIAL MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
5.		CONSTRUCTION PERSONNEL MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
6.		BUSINESS ECONOMICS AND FINANCE MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
7.		RESOURCE MANAGEMENT AND CONTROL IN CONSTRUCTION	CIVIL	EC-PS	3	0	0	3	NIL
8.		PROJECT SAFETY MANAGEMENT	CIVIL	EC-PS	3	0	0	3	NIL
9.		MAINTENANCE AND REHABILITATION OF STRUCTURES	CIVIL	EC-PS	3	0	0	3	NIL

Open electives (Courses on emerging areas..) – Credits 03									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		METAL ADDITIVE MANUFACTURING	MECH	OE-EA	3	0	0	3	NIL
2.		WASTE TO ENERGY	BTE	OE-EA	3	0	0	3	NIL
3.		BIOMEDICAL PRODUCT DESIGN AND DEVELOPMENT	BME	OE-EA	3	0	0	3	NIL
4.		ADVANCED CYBER SECURITY	CSE	OE-EA	3	0	0	3	NIL
5.		BIO MEMS	ECE	OE-EA	3	0	0	3	NIL
6.		SOLAR AND ENERGY STORAGE SYSTEMS	EEE	OE-EA	3	0	0	3	NIL

D. Employability Enhancement Courses and courses for presentation of technical skills related to the specialization (Credits - 21)									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		PROJECT WORK PHASE I	CIVIL	EE-P	0	0	12	6	NIL
2.		PROJECT WORK PHASE II	CIVIL	EE-P	0	0	24	12	NIL
3.		TECHNICAL SEMINAR	CIVIL	EE-S	0	0	2	1	NIL
4.		RESEARCH PRESENTATION SKILLS	CIVIL	EE-D	0	0	2	1	NIL

E. Audit courses-Zero Credit									
S.No	**CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.		ENGLISH FOR RESEARCH PAPER WRITING	ENG	AC	0	0	2	0	NIL
2.		VALUE EDUCATION	HS	AC	0	0	2	0	NIL
3.		CONSTITUTION OF INDIA	LAW	AC	0	0	2	0	NIL
4.		PEDAGOGY STUDIES	HS	AC	0	0	2	0	NIL
5.		PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTEN SKILLS	ENG	AC	0	0	2	0	NIL

IMPLEMENTATION PLAN
PROGRAMME STRUCTURE

Semester I

SL. NO	COURSE CODE	COURSE TITLE	DEPT OFFERING THE COURSE	CATEGORY	L	T	P	C
THEORY								
1.		Statistical Methods and Queuing Theory	MATHS	FC	3	0	0	3
2.		Construction Materials and Concrete Design	CIVIL	CC	3	1	0	4
3.		Modernistic approaches in Construction	CIVIL	CC	3	1	0	4
4.		Program Core Elective I	CIVIL	PE	3	0	0	3

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	DEPT OFFERING THE COURSE	CATEGORY	L	T	P	C
THEORY								
1.		Project Formulation and Appraisal	CIVIL	CC	3	1	0	4
2.		Construction Planning, Scheduling and Control	CIVIL	CC	3	1	0	4
3.		Quantitative Techniques in Construction Management	CIVIL	CC	3	0	0	3
4.		Program Core Elective II	CIVIL	PE	3	0	0	3

SEMESTER III

SL. NO.	COURSE CODE	COURSE TITLE	DEPT OFFERING THE COURSE	CATEGORY	L	T	P	C
THEORY								
1		Advanced Project Management concepts	CIVIL	CC	3	1	0	4
2		Advanced Concrete Technology	CIVIL	CC	3	1	0	4
3		Program Core Elective III	CIVIL	PE	3	0	0	3
4		Program Core Elective IV	CIVIL	PE	3	0	0	3
PRACTICAL								
5		Computer Applications in Construction Engineering and Planning Laboratory	CIVIL	CC	0	0	4	2
6		RESEARCH PRESENTATION SKILLS	CIVIL	EE-D	0	0	2	1

SEMESTER IV

SL. NO.	COURSE CODE	COURSE TITLE	DEPT OFFERING THE COURSE	CATEGORY	L	T	P	C
1		Quality and safety in construction	CIVIL	CC	3	0	0	3
2		Program Core Elective V	CIVIL	PE	3	0	0	3
3		Open Elective		OE	3	0	0	3
4		Technical Seminar	CIVIL	PI	0	0	2	1
5		Audit Course I		AC	0	0	0	0
6		Audit Course II		AC	0	0	0	0

SEMESTER V

SL. NO.	COURSE CODE	COURSE TITLE	DEPT OFFERING THE COURSE	CATEGORY	L	T	P	C
1		Research Methodology and IPR	CIVIL	FC	2	0	0	2
2		Project work phase I	CIVIL	PI	0	0	12	6

SEMESTER VI

SL. NO.	COURSE CODE	COURSE TITLE	DEPT OFFERING THE COURSE	CATEGORY	L	T	P	C
1		Project Work phase II	CIVIL	PI	0	0	24	**12**

TOTAL CREDITS : 75