G. PULLA REDDY ENGINEERING COLLEGE (Autonomous): KURNOOL

SCHEME AND SYLLABUS FOR B.TECH. (MINOR) IN

CONSTRUCTION PLANNING AND PROJECT MANAGEMENT (CPPM)

SCHEME – 2020

Scheme and Syllabus for B.Tech.(Minor) in Construction Planning and Project Management (CPPM)

Civil Engineering Department

G. Pulla Reddy Engineering College (Autonomous): Kurnool

Accredited by NBA of AICTE and NAAC of UGC

Affiliated to JNTUA, Anantapuramu

G. PULLA REDDY ENGINEERING COLLEGE (Autonomous) : KURNOOL

Vision of the Institution:

To become the choicest institute of technology and a hub of academic and industrial research and development

Mission of the Institution:

To provide conducive academic ambience, excellent infrastructure, continually updated lab equipment and committed and scholarly faculty to realize the vision of the college.

Civil Engineering Department

Vision of the Department:

To make the Civil Engineering Department at G. Pulla Reddy Engineering College (Autonomous), Kurnool; a leader in the education of practice-oriented Civil Engineers that benefit industry and society.

Mission of the Department:

M1: To prepare students for a career in the Civil Engineering Profession by providing technical knowledge and skills imparted by the team of faculty adopting an effective teaching learning process.

M2: To produce quality Engineers who are capable of meeting the demands and challenges of the profession by focusing on latest practices.

M3: To inculcate in its students leadership abilities, research capabilities, ethical values and work culture that would lead towards the betterment of the society.

Program Educational Objectives (PEOs):

PEO1: Apply a broad, fundamental-based knowledge, and technical skills required for achieving professional success.

PEO2: Carry out design works in Civil Engineering, using relevant software tools, following appropriate procedures, keeping the economic and environmental aspects in view.

PEO3: Follow the professional ethics in the practice of the profession showing concern for social responsibilities.

PEO4: Pursue a professional career aimed at effective management of resources and focus on lifelong learning and research.

Program Specific Outcomes (PSOs):

The Civil Engineering Graduates can

PSO1: Plan, analyze and design the components of Engineering structures and transportation systems and estimate the cost of construction.

PSO2: Design and execute the construction of water resources projects and water distribution systems, using Engineering investigations and surveys.

PSO3: Implement the established procedures for conducting laboratory and field investigations on soils and engineering materials aimed at ensuring quality in execution of civil Engineering projects.

PSO4: Demonstrate professional ethics and implement the project management principles including project finance, leading to execution of projects as per design requirement using technical skills and relevant software.

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.

Department of Civil Engineering

Minor in Construction Planning and Project Management (CPPM)

(For Non Civil Engineering Students)

Scheme of Instructions and Examination
(Effective from 2020-21)

S. No.	Course Code	Subject	Credits	Scheme of Instruction periods/week			Scheme of Examination Maximum Marks		
				L	D/T	P	End Exam	Continuous Internal Assessment	Total
1	MCM01	Construction Project Management	4	4	–	–	60	40	100
2	MCM02	Building Materials and Construction	4	4	–	–	60	40	100
3	MCM03	Quality Control and Safety Management	4	4	–	–	60	40	100
4	MCM04	Disaster Preparedness and Planning Management	4	4	–	–	60	40	100
		MOOC - 1	2	0	–	–	–	–	100
		MOOC – 2 / Mini Project	2	0	–	–	–	–	100
		Total	**20**						

MOOC – 1:

1. Construction Cost Economics & Finance
2. Contract Laws & Regulations

MOOC – 2:

1. Energy Conservation Techniques in Building Construction
2. Construction Personal Management

CONSTRUCTION PROJECT MANAGEMENT (CPM)

Minor in CPPM						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	Continuous Internal Assessment	End Exam	Total
MCM01	PCC	4	-	-	4	40	60	100
Sessional Exam Duration : 1.5 Hrs						End Exam Duration: 3 Hrs		

Course Outcomes : At the end of the course the student will be able to

CO1: Understand the elements of construction planning and scheduling and to apply appropriate tools and techniques like networks and coding systems.

CO2: Understand the monitoring of projects through cost control.

CO3: Understandthe elements of concluding, and administering contracts.

CO4: Understandthe preparation of the detailed estimation.

CO5: Understandthe relation between technology and construction safety.

UNIT – I

Construction as Industry and its challenges – Role of construction management – Methods of construction managements – Basic requirements of construction management – Learning structures – Life cycle of construction projects – Conceptual planning, analysis and design, procurement, utilization and maintenance – Examples of real projects and its learning requirement.

UNIT - II

Introduction to network based project management techniques – Defining activities and their interdependence – Drawing of network – Time and resource estimations – Use of network as scheduling techniques – Use of network as control techniques – Project monitoring.

UNIT – III

Stages of awarding contract – Types of contract – Contract documents – Arbitration and settlements of disputes – Contract laws and handling of contracts.

UNIT – IV

Principles of estimation – Examples of estimation of materials for various structures – Principles of general and detailed specifications – Analysis of rate – Definition of analysis of rates – Prime cost – Work charged establishment – Resource planning through analysis of rate – PWD schedules – Measurements and measurement book.

UNIT - V

Construction safety – Use of information technology in construction industries – Automation in construction industry: A general discussion.

Text Books :

1. Chitkara K.K., *Construction Project Management: Planning Scheduling and Control,* Tata McGraw Hill Publishing Company, New Delhi.
2. Vohra N.D., *Quantitative Techniques in Management,* Tata McGraw Hill Co., Ltd, New Delhi.
3. Moder, J., C. Phillips and E. Davis, *Project Management with CPM, PERT and Precedence Diagramming,* Van Nostrand Reinhold Company, Third Edition.

Reference Books :

1. John G. Betty, *Engineering Contracts,* McGraw Hill.
2. Steven McCabe, *Quality Improvement Techniques In Construction,* Addison Wesley Longman Ltd, England.

Web References :

1.https://www.nptel.ac.in/courses/105103093/

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

BUILDING MATERIALS AND CONSTRUCTION (BMC)

Minor in CPPM						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	Continuous Internal Assessment	End Exam	Total
MCM02	PCC	4	-	-	4	40	60	100
Sessional Exam Duration : 1.5 Hrs						End Exam Duration: 3 Hrs		

Course Outcomes : At the end of the course the student will be able to

CO1: Understand the different loads and loading conditions and their importance - IS codes provisions.

CO2: Understand the concrete and its behaviour while used in construction.

CO3: Understand the properties of concrete used in construction.

CO4: Understand the properties of bricks and steel used in construction.

CO5: Know about the requirements of designing the masonry structures.

UNIT – I

Functions of building and structure in general – Loads on buildings as per IS 875, IS 1893 and NBC – Functional requirements of buildings and necessity of byelaws – Role of materials in construction.

UNIT - II

Concrete as a material, its ingredients – Concrete production process including prefabrication – Modular coordination. Cement: Hydration of cement – Chemical reaction – Consistency and setting – Lime and supplementary cementitious materials.

UNIT – III

Fresh Concrete: Role of aggregates and water in fresh concrete – Workability test for workability – Role of admixtures – Segregation and bleeding – Strength of Concrete – Role of porosity, w/c ratio – Role of aggregate – Aggregate-mortar interface – Tensile strength – Modulus of elasticity and their test – NDT.

UNIT – IV

Bricks and mortar and their properties – Brick and other masonry construction – Selection of bricks / masonry units – Mortar for masonry – Requirement of walls – Types of walls – Masonry design requirements as per IS1905 – Metals with reference to structural steel – Structure and its role in properties of steel – Strengthening mechanism in metals – Behaviour in service and corrosion – Uses of metals in Civil Engineering.

UNIT - V

Plastics and Polymers in construction – Admixture paints – Sealants – Adhesives – Water proofing materials – Timber – Plywood – Glasses – Typical roof construction and foundations –

Plastering – Pointing – Damp proofing.

Text Books :

1. B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, *Building Construction*
2. Raju K.V.B, Ravichandran P.T, *Basics of Civil Engineering*, Ayyappa Publications, Chennai.
3. Rangwala .S.C, *Engineering Material*s, Charotar Publishing House, Anand.
4. S. S. Bhavikatti, *Building Materials*, Vices publications House private Ltd.

Reference Books :

1. P. C. Verghese, Building construction, PHI Learning (P) Ltd.
2. M. L. Gambhir, Building Materials, Tata McGraw Hill Publishing Co. Ltd. New Delhi.

Web References :

1.https://www.nptel.ac.in/courses/105102088/

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

QUALITY CONTROL AND SAFETY MANAGEMENT (QCSM)

Minor in CPPM					Scheme : 2020			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	Continuous Internal Assessment	End Exam	Total
MCM03	PCC	4	-	-	4	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			

Course Outcomes : At the end of the course the student will be able to

CO1: Understand the elements of quality planning and the implication.

CO2: Understand the objectives and advantage of quality assurance.

CO3: Understand the relationship between quality and safety management.

CO4: Understand the site safety techniques.

CO5: Understand the value Engineering and environmental safety measures.

UNIT – I

Introduction to Quality: Variability – Quality Improvement – Quality characteristics – Quality planning – Quality assurance – Responsibilities and authorities in quality assurances and quality control – Quality philosophy by W. Edward Deming.

UNIT - II

Quality Management Systems: Types of organizations – Inspection, control and enforcement – Quality management systems and methods – Quality control improvement – Architects, Engineers, Contractors, and Special Consultants, Quality circle.

UNIT – III

Safety Management: Introduction to safety – Hazard – Causes of construction accidents – Sings and symbols–Role of stakeholders in construction safety – Measure to select safe contractors – Designer and construction safety – Causes and effects of accidents on site.

UNIT – IV

Site Safety Programs: Job hazard analysis – Accident investigation and accident indices– Violation– Penalty alteration methods for safety – Demolition works – Earthwork, temporary structures.

UNIT - V

Construction Activity: Construction activity– Environmental safety – Social and environmental factors – Natural causes and speed of Construction – Life cycle costing – Reliability and Probabilistic methods – Value Engineering and value analysis.

Text Books :

1. Kwaku, A., Tenah, Jose. M. Guevara, *Fundamentals of Construction Management and Organization*, Reston Publishing Co., Inc., Virginia.
2. Juran Frank, J.M. and Gryna, F.M., *Quality Planning and Analysis*, Tata McGraw Hill.
3. Hutchins. G, ISO 9000, *Viva Books*. New Delhi.
4. Clarkson H. Oglesby, *Productivity Improvement in Construction*,McGraw Hill.

Reference Books :

1. John L. Ashford, *The Management of Quality in Construction,* E & F.N, Spon., New York.
2. Steven McCabe, *Quality Improvement Techniques In Construction*, Addison Wesley Longman Ltd, England.

Web References :

1.https://nptel.ac.in/courses/105/102/105102206/

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

DISASTER PREPAREDNESS AND PLANNING MANAGEMENT (DPPM)

Minor in CPPM						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	Continuous Internal Assessment	End Exam	Total
MCM04	PCC	4	-	-	4	40	60	100
Sessional Exam Duration : 1.5 Hrs						End Exam Duration: 3 Hrs		

Course Outcomes : At the end of the course the student will be able to

CO1: Understand definitions and terminologies used in disaster management.

CO2: Understand types and categories of disasters.

CO3: Understand the impact of disasters on socio-economic and environment.

CO4: Plan for disaster risk reduction, mitigation and management strategies.

CO5: Analyze relationship between development and disasters.

UNIT – I

Introduction: Concepts and definitions: disaster, hazard, vulnerability, risks, severity, frequency and details, capacity, impact, prevention, mitigation.

UNIT - II

Disasters: Disasters classification.

Natural Disasters: Floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.

Manmade Disasters: Industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills, transportation accidents, terrorist strikes – Hazard and vulnerability profile of India – Mountain and coastal areas – Ecological fragility.

UNIT – III

Disaster Impacts: Disaster impacts – Environmental, physical, social, ecological, economic, political – Health – psycho-social issues – Demographic aspects – Gender, age, special needs – Hazard locations – Global and national disaster trends – Climate change and urban disasters.

UNIT – IV

Disaster Risk Reduction (DRR):

Disaster Management Cycle – its phases: Prevention, mitigation, preparedness, relief and recovery; Structural and non-structural measures – Risk analysis – Vulnerability and capacity assessment – Early warning systems.

Post-Disaster Environmental Response: Water, sanitation, food safety, waste management, disease control, security, and communications – Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders – Policies and legislation for

disaster risk reduction – DRR programs in India and the activities of National Disaster Management Authority.

UNIT - V

Disasters, Environment and Development: Factors affecting vulnerability such as impact of developmental projects and environmental modifications due to dams, land-use changes, urbanization – Sustainable and environmental friendly recovery – Reconstruction and development methods.

Text Books :

1. Pradeep Sahni, *Disaster Risk Reduction in South Asia*, PHI, New Delhi.
2. Ghosh G.K., *Disaster Management*, APH Publishing Corporation
3. Singh B.K., *Handbook of Disaster Management: Techniques & Guidelines*, Rajat Publication.
4. V.K. Sharma, *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi

Reference Books :

1. A Status Report Publication of the Govt. of India, Ministry of Home Affairs, National Disaster Management Division, *Disaster Management in India*.
2. A. S. Arya, Anup Karanth, and Ankush Agarwal, *Hazards, Disasters and Your Community; A Primer for Parliamentarians*, GOI–UNDP Disaster Risk Management Programme.
3. Inter-Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC

Web Reference:

1. http://ndma.gov.in/ (Home page of National Disaster Management Authority)
2. http://www.ndmindia.nic.in/ (National Disaster management in India, Ministry of Home Affairs).
3. www.odihpn.org., *Disaster Preparedness Programme in India. A Cost Benefit Analysis*, Commissioned and Published by the Humanitarian Practice Network 'at ODI HPN.
4. www.empowerpoor.org, *Drought in India: Challenges and Initiatives; Poorest Areas in Civil Society (PACS) Programme*. [2001–2008]

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.