II- SEMESTER

BUILDING MANAGEMENT 2 (Studio 2)			
Course Code	**MCPM201**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	02:05:00	Viva Marks	50
Total Hours of Pedagogy	128	Total Marks	100
Credits	9		

Course Learning Objectives:

- To understand the service aspects of high-rise buildings.
- To analyze the operation and maintenance of such services.
- To prepare time schedules for installation services in the building.
- To prepare a work breakdown structure for services

Module-1	
Introduction to Building Bye laws and the building services (Electrical, building automation and infrastructure services) by the faculty and book review.	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-2	
Case studies and industrial visits related to the building techniques, building services and operation and maintenance, analyzing the details.	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts* ***Blended learning:*** *Power Point presentation and webinars.*

Module-3	
Preparation of time schedules related to the installation of services in the building.	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts* ***Blended learning:*** *PowerPoint presentation and webinars.*

Module-4	
Preparation of work breakdown structure and estimates.	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-5	
Energy audit of the selected building.	
Teaching-Learning Process	***Blended learning:*** *Power point presentation and webinars.*

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in viva voce is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report.

Viva voce Examination:

1. The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.

2. The Viva-voce will be evaluated by two external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.

3. The viva-voce marks awarded for PSC (Professional supportive course), shall be based on the evaluation of report submission, presentation skill and performance in Question-and-Answer session in the ratio 30:10:10.

4. The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

Suggested Learning Resources:

Books

1. Introduction to the Design and Analysis of Building Electrical Systems
2. Electrical Design Guide for Commercial Buildings. Book by William H. Clark
3. Energy-Efficient Electrical Systems for Buildings Book by Moncef Krarti
4. Intelligent Buildings and Building Automation. Book by Shengwei Wang
5. Construction and Building Automation: From Concepts to ...Book by Benny Raphael

Web links and Video Lectures (e-Resources):

Video Tutorial https://www.youtube.com/watch?v=0LNklcBhl_Q&list=PLp6ek2hDcoNCb0R8gxk1WzpTN94eXs9vb

Web Link
https://guides.smartbuildingsacademy.com/building-automation-system

Skill Development Activities Suggested

- Guest Lecture from expert.
- Attending webinars.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Explain the essential services in a multi storeyed building.	L1
CO2	Describe the operation and maintenance of the services in building.	L1
CO3	Devise a work breakdown structure for the packages	L4
CO4	Write time schedules for different work packages	L6
CO5	Write cost estimates for work related to services.	L6

Program Outcomes of the CPM Program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COS and POS

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**H**	**L**	**0**	**M**	**0**	**M**	**L**	**0**
CO2	**H**	**L**	**0**	**O**	**O**	**M**	**0**	**0**
CO3	**H**	**L**	**0**	**M**	**0**	**M**	**0**	**0**
CO4	**H**	**M**	**0**	**L**	**0**	**0**	**L**	**0**
CO5	**H**	**L**	**0**	**L**	**0**	**L**	**L**	**0**

H – High , M – Medium, L - Low

II- SEMESTER

PROJECT MANAGEMENT -2			
Course Code	**MCPM202**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	02:00:04	SEE Marks	50
Total Hours of Pedagogy	32+64(SDA)	Total Marks	100
Credits	04	Exam Hours	3

Course Learning objectives:

- Understanding about project management concepts from PMBOK.
- Introduction to project communication, procurement and cost management,
- Familiarize about the concepts of resource management and conflict management and dispute resolution.
- To understand the role of stake holder in a project and ways to maintain stakeholder registry.
- T o understand the roles of construction manager and contractor.
- To analyze manager's role in contract signing.

Module-1

Introduction to project management topics: Project Charter, Project Management Plan, Project Management, Programme Management &Portfolio Management, Stakeholder Management, Scope Management, Schedule Management, Change Management.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-2

Introduction to project management topics: Communication Management, Procurement Management, Cost Management, Quality Management, Safety Management, Strategy Management.

Teaching-Learning Process	***Direct method****: Lecture supported by the conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research news paper reading and inferences from the same.* ***Blended learning:*** *PowerPoint presentation and webinars.*

Module-3

Introduction to project management topics: Resource Management, Conflict Management & Dispute resolution, contract Management, Design Management, Benefits Management, Project Closure.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts* ***Blended learning:*** *Power point presentation and webinars.*

Module-4

Stake holder management: Definition of stakeholder, Stakeholder category. Stakeholder groups-Team member, Executive and other stakeholder. Stakeholder registry. Stakeholder management. Stakeholder communication, managing stakeholders in virtual world,
Managing difficult stakeholder.

Teaching-Learning Process	***Direct method**: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts* ***Blended learning:** Power point presentation and webinars.*

Module-5	
Construction Management: Introduction, Understand the role and the importance of the construction manager to the project, construction managers tasks, difference between a construction manager and a genera lor prime contractor for a construction project, Define due diligence and how it applies to construction projects, Understand the construction managers role in contract signing, Carry out the Construction managers duties.	
Teaching-Learning Process	***Direct method**: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts* ***Blended learning:** Power point presentation and webinars.*

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of 20 Marks (duration 01 hour 30 min)
1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 13th week of the semester

Two assignments each of 10 Marks
4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester
Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for 20 Marks(duration 01 hours)

6. At the end of the 13th week of the semester
The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be scaled down to 50 marks

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 03 hours)

1. The question paper will have ten questions. Each question is set for 20 marks.

2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

The students have to answer 5 full modules, selecting one full question from each module. Marks scored by the student will be scale downed to 50 Marks.

Suggested Learning Resources:

Books

1. Association for Project Management, 2012.A *PMbody of knowledge*. Buckinghamshire: Association for Project Management.
2. Guide, A., 2017. Project Management Body of Knowledge *(PMBOK®GUIDE)*. Project Management Institute.
3. Dr.K.G. Krishnamurthy and S.V. Ravindra, 2008.*Construction and Project Management*.
4. Hendrickson, C., Hendrickson, C.T. and Au, T., 1989. Project management for construction: Fundamental concepts for owners, engineers, architects, and builders. Chris Hendrickson.
5. Chris, H., 2003. Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects and Builders. Department of Civil and Environmental Engineering.
6. Punmia, B.C. and Khandelwal, K.K.,2002. *Project Planning and Control with PERT&CPM*. Fire wall media.
7. Jha, K.N., 2015.Construction Project Management: Theory and Practice. Pearson Education India.

Web links and Video Lectures (e-Resources):

Video Tutorial
https://www.youtube.com/watch?v=0LNklcBhl_Q&list=PLp6ek2hDcoNCb0R8gxk1WzpTN94eXs9vb

Web Link
https://guides.smartbuildingsacademy.com/building-automation-system

Skill Development Activities Suggested

- Guest Lecture from expert.
- Attending webinars.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Describe about the concepts of project management as detailed in PMBOK.	L1
CO2	Interpret the concepts of communication, procurement, cost and quality management for construction projects.	L2
CO3	Explain about strategies to manage resources , conflicts in construction site.	L4
CO4	Describe about handling contracts and design management .	L1
CO5	Classify stakeholders and there roles.	L2
CO6	Interpret the roles and responsibilities of project manager.	L2
CO7	Describe the differences in construction manager and contractor roles in a project.	L1

Program Outcomes of the CPM Program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COS and POS

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	H	L	L	L	0	0	M	0
CO2	H	L	L	L	0	L	M	L
CO3	H	M	M	M	0	0	L	L
CO4	H	M	0	L	0	0	M	0
CO5	H	M	L	L	0	0	L	0
CO6	H	L	L	L	0	0	L	L
CO7	H	M	L	L	0	0	L	0

H – High , M – Medium, L - Low

II - SEMESTER

PROJECT RESOURCE MANAGEMENT			
Course Code	**MCPM203**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	03:02:00	SEE Marks	50
Total Hours of Pedagogy	48+32	Total Marks	100
Credits	04	Exam Hours	3

Course Learning objectives:

- To know the process of planning, maintaining and replacement of construction equipment's.
- To study the concepts of inventory management and store management.
- To know the types of construction equipment's used in the projects.
- To study the human resources aspects of construction projects.
- To know about wage rates and resources productivity.
- To study about effective communication management between project team members.

Module-1

Earth Moving Operations – Types of Earthwork Equipment – Tractors, Motor, Graders, Scrapers, Front end Waders, Earth Movies. Equipment for Dredging, Trenching, Tunnelling, Drilling, Blasting – Equipment for Compaction – Erection Equipment – Types of pumps used in construction.

Equipment for Dewatering and Grouting – Foundation and Pile Driving Equipment Forklifts and Related Equipment – Portable Materials Bins – Conveyors – Hauling Equipment

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same* ***Blended learning:*** *Power point presentation and webinars.*

Module-2

CONSTRUCTION EQUIPMENT MANAGEMENT Identification – Planning – Equipment Management in Projects – Maintenance Managements – Replacement – Cost Control of equipment – Depreciation Analysis – Safety Management. Equipment owning types, Breakeven point ownership, cost and maintenance cost, Salvaging. Fundamentals of earthwork operations.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-3

CONSTRUCTION MATERIAL MANAGEMENT: Importance of material Management – Classification and Codification of materials, Inventory Control – Managing the Inventory and Flow of raw materials, Work – in – Process, Finished Goods, and Supplies to ensure / enhance the organization's competitiveness and profitability, Application of ABC Analysis in inventory control, Inventory Management Safety Stock, Stock Outs. Stores Management: Quality control, Use of (MMS) – Materials Management Systems

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts., Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-4

HUMAN RESOURCE DEVELOPMENT Introduction – Organization – Fulcrum of the modern enterprise – informal groups – Management – Employees – Human resource management.

INDUSTRIAL RELATIONS AND LABOUR LAWS

Labour legislation – nature and scope – Indian constitution and labour – labour laws for the building Industry – laws regulating wages and payments to workers – social security laws – industrial relations laws – miscellaneous laws- Industrial relations and trade unions.

Teaching-Learning Process	***Direct method**: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same* ***Blended learning:** Power point presentation and webinars.*

Module-5

MANAGING PERSONNEL AND RELATIONS: Personnel management – nature and scope – personnel plan – personnel department – manpower planning, recruitment and selection. In-service training – Training Inputs – Principles – Types – Assessments. Wages and salary administration – Wage rate – Wage payment methods – Incentive plan – Fringe benefits – Productivity earnings and profit sharing – Bonus payment – Wage legislation – Wage administration. Productivity in construction – measuring productivity – Factors affecting productivity – Responsibility for productivity. Employees relation in an organization – Characteristics of groups – Roles of project manager – Communication – Types of communication - Communication process – Effective communication – the art of listening – Motivating employees – Hierarchy of motivation.

Teaching-Learning Process	***Direct method**: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts* ***Blended learning:** Power point presentation and webinars.*

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of 20 Marks (duration 01 hour 30 min)
1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 13th week of the semester.

Two assignments each of 10 Marks
4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for 20 Marks(duration 01 hours)

6. At the end of the 13th week of the semester
The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be scaled down to 50 marks

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 03 hours)

1. The question paper will have ten questions. Each question is set for 20 marks.

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2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.
The students have to answer 5 full modules, selecting one full question from each module. Marks scored by the student will be scale downed to 50 Marks

Suggested Learning Resources:
Books

1. Peurifoy, R.L., Ledbetter, W.B.and Schexnayder, C., "Construction Planning, Equipment and Methods", 5th Edition, McGraw Hill, Singapore, 1995.

2. Sharma S.C. "construction Equipment and Management", Khanna Publishers New Delhi, 1988.

3. Deodhar, S.V. "Construction Equipment and Job Planning", Khanna Publishers New Delhi, 1988.

4. Dr.Mahesh Varma, "Construction Equipment and its Planning and Application", Metro –Politan Book Company, New Delhi, 1983 5. Journals such as Civil Engineering and Construction Review (CE&CR), New building materials and Construction world (NBM &CW).

6. 'Materials of Construction' by Ghose, Tata – McGraw Hill Publication.
7. Handbook of Materials Management – Gopalkrishnan, Prentice Hall Publication.

Web links and Video Lectures (e-Resources):

Video Tutorial
https://www.youtube.com/watch?v=2B7DhQvL8kw&list=PLwdnzlV3ogoVGSUhjx4VzW-dGz7DqQFoj

Web Link
https://lecturenotes.in/subject/202/construction-equipments-planning-and-management-cepm/note

Skill Development Activities Suggested

- Guest Lecture from an expert.
- Attending webinars.

Course outcome (Course Skill Set)

At the end of the course, the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Describe the planning strategies in the procurement of equipment's	L1
CO2	Explain the process and control of inventory and stores management	L1
CO3	Classify the construction equipment's used in the projects.	L2
CO4	Explain about the organization setup and human resource management	L1
CO5	Describe about the ways of managing wages and man power requirement	L1
CO6	Explain about the ways of implementing effective communication	L2

Program Outcomes of the CPM Program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COS and POS

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**H**	**L**	**L**	**H**	**O**	**0**	**L**	**0**
CO2	**H**	**L**	**L**	**H**	**O**	**0**	**L**	**0**
CO3	**H**	**L**	**L**	**M**	**0**	**0**	**L**	**0**
CO4	**H**	**M**	**L**	**0**	**0**	**L**	**L**	**L**
CO5	**H**	**M**	**L**	**L**	**0**	**0**	**L**	**L**
CO6	**H**	**H**	**L**	**L**	**0**	**0**	**L**	**0**

II Semester

BUILDING ENERGY ANALYSIS AND MANAGEMENT			
Course Code	MCPM204	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	02:00:02	SEE Marks	50
Total Hours of Pedagogy	32+32(SDA)	Total Marks	100

Credits	3	Exam Hours	3

Course Learning objectives:

- To introduce the need for energy management and energy audit in buildings.
- To achieve higher standards in building design and operation with a solid foundation of energy engineering and sustainability principles.
- To use building performance modelling as an investigative tool to improve overall energy efficiency of the building

Module-1

INTRODUCTION

Energy sources - energy demand and supply, energy crisis, future scenario, Alternate sources of energy - Energy system efficiency, energy conservation aspects, Principles of Energy management and Audit - General principles, planning and program - Introduction to Energy Audit -Types and Methodology, site surveys, energy systems survey, Instrumentation and measurement, analysis of data and results.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concept of energy sources and energy management. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.*

Module-2

ENERGY AND BUILDING SERVICES

Thermal performance characteristics of building elements/enclosure; Energy efficiency in design and operation of building services; Energy audit in different types of buildings and Energy Management; Recycling and reuse of water products, Concepts of Green and Sustainable Buildings.

HVAC : HEATING AND COOLING MANAGEMENT

General principles of energy managements in HVAC systems; Energy management opportunities; Modelling of heating and cooling loads in buildings.

ELECTRICAL LOAD AND LIGHTING MANAGEMENT

General Principles; Illumination and human comfort; Lighting systems; Equipments; Energy management opportunities; Electrical load analysis; Peak load controls. Process energy Management: Principles; Modelling of electrical and lighting loads in buildings.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concept of HVAC and Electrical load and lighting management* ***ICT and Digital support****: Video to demonstrate the process of HVAC and Electrical load and lighting management. Power point presentation to elaborate Modelling of HVAC, electrical and lighting loads in buildings.*

Module-3

BUILDING INFORMATION MODELING (BIM)

Use of computers, building information management of energy with environment aspects - Building information modelling (BIM) - Facilitates documentation - design exploration - model-based quantity take off and estimating - interference checking - construction coordination and sequencing - digital fabrication and 3-D building information capture and visualization. - Examine geometry - spatial relationships - building information - quantities and properties of building components - Integrating people – systems - business structures and practices for maximizes efficiency through all phases of design – fabrication - construction and life cycle of the structure.

Teaching-Learning Process	***ICT and Digital support****: Video to demonstrate the BIM modelling .Power point presentation to elaborate Modelling of BIM.* ***Collaborative and Cooperative learning***: *Students should work on BIM model as group work. The research and learning to be share with the class*.
Module-4	

INTEGRATED BUILDING SYSTEMS General principles - environment conformation - Passive design considerations - integration of building system - energy storage - cold storage techniques - Economic analysis, economic aspects of energy management - Economic analysis methods - life-cycle costing - break even analysis - benefit cost analysis - payback period analysis - present worth analysis - equivalent annual cost analysis	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concept of integrated building system* ***ICT and Digital support****: Video to demonstrate the process of integrated building system. Power point presentation to elaborate integrated building system.*
Module-5	
COMPREHENSIVE LEARNING Based on understanding of above Units the students are expected to perform various simulation analysis on Energy load, life cycle analysis etc., through BIM of a small project emphasizing on Energy efficiency design.	
Teaching-Learning Process	***Collaborative and Cooperative learning***: *Students should work on BIM model as individual work. The research and learning to be share with the class*.

Assessment Details (both CIE and SEE):

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of 20 Marks (duration 01 hour 30 min)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 13th week of the semester

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for 20 Marks(duration 01 hours)

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be scaled down to 50 marks

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 03 hours)

1. The question paper will have ten questions. Each question is set for 20 marks.

2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

The students have to answer 5 full modules, selecting one full question from each module. Marks scored by the student will be scale downed to 50 Marks

Suggested Learning Resources:

Books

15. Clive Beggs. (2009). Energy: Management, Supply and Conservation, Routledge.
16. Douglas Harris. (2011). A Guide to Energy Management in Buildings, Routledge.
17. Koenigsberger, O.H, Ingersoll, T. G., Mayhew. A, Szokolay.S.V.(2004). Manual of Tropical Housing and Building Part 1
18. LalJayamaha. (2006). Energy-Efficient Building Systems: Green Strategies for Operation and Maintenance, McGraw-Hill Professional.
19. Steve Doty and Wayne C. Turner. (2012) Energy Management Handbook, Fairmont Press.
20. Tarik Al-Shemmeri (2011). Energy Audits: A Workbook for Energy Management in Buildings, Wiley.
21. W R Murphy, G Mckay. (1981). Energy Management, Butterworth-Heinemann Ltd.

Web links and Video Lectures (e-Resources):

NPTEL Lecture 12- Energy Efficiency and Stimulation :
http://www.digimat.in/nptel/courses/video/105107156/L12.html

NPTEL Lecture 16- Energy Efficiency, Acoustics and Day lighting in Buildings:
https://www.digimat.in/nptel/courses/video/105102175/L16.html

Skill Development Activities Suggested

- Guest Lecture from expert.
- Case Studies :
  1) The Energy and Resources Institute (TERI) – Bangalore
  2) Titan new corporate campus (GRIHA Rating: 5 Stars) – Bangalore
  3) Mahindra World City in Chennai, India (certified under certified under the Indian Green Building Council's (IGBC) Green Townships rating system.
  4) DLF Cyber city in Chennai – LEED Platinum certified project.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Interpret the understanding of energy sources, principles of energy management and energy auditing.	L2
CO2	Interpret the understanding of the thermal performance of buildings.	L2
CO3	Develop the knowledge to demonstrate an understanding of energy efficiency in design and operation of building services.	L3
CO4	Develop the model using energy simulation software tools and generate building energy information its performance.	L3
CO5	Develop an integrated building system approach to energy management using passive design techniques.	L3
CO6	Evaluate energy efficiency design through a simulation analysis approach.	L4

Program Outcome of this course:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**H**	**0**	**L**	**0**	**M**	**H**	**M**	**M**
CO2	**H**	**H**	**M**	**0**	**M**	**M**	**M**	**L**
CO3	**H**	**L**	**L**	**M**	**H**	**L**	**H**	**M**
CO4	**0**	**L**	**M**	**H**	**L**	**L**	**M**	**M**
CO5	**M**	**L**	**M**	**M**	**M**	**M**	**H**	**H**
CO6	**M**	**M**	**L**	**H**	**H**	**M**	**M**	**M**

H – High , M – Medium, L - Low

II Semester Elective -2

PROJECT FORMULATION AND APPRAISAL			
Course Code	MCPM215A	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	02:00:02	SEE Marks	-
Total Hours of Pedagogy	64	Total Marks	100
Credits	3	Exam Hours	Nil

Course Learning objectives:

- To study and understand the formulation, costing of construction projects, appraisal, finance and private sector participation.

Module-1

Project Formulation

Project – Concepts – Capital investments - Generation and Screening of Project Ideas - Project identification – Preliminary Analysis, Market, Technical, Financial, Economic and Ecological - Prefeasibility Report and its Clearance, Project Estimates and Techno-Economic Feasibility Report, Detailed Project Report – Different Project Clearances required.

Teaching-Learning Process	**ICT and digital support**: Power point presentations to analyze the market trend and investments as per the public demand. Sample project clearance report – Environmental clearance, CRZ etc.

Module-2

Project Costing & Appraisal

Project Cash Flows – Time Value of Money – Cost of Capital. NPV – BCR – IRR – ARR – Urgency – Pay Back Period – Assessment of Various Methods – Indian Practice of Investment Appraisal – International Practice of Appraisal – Analysis of Risk – Different Methods – Selection of a Project and Risk Analysis in Practice

Teaching-Learning Process	**Direct method:** *Lecture supported by conventional method of Blackboard and chalk to introduce the concept of NPV, BCR, IRR and ARR.*

Module-3

Project Financing

Project Financing – Means of Finance – Financial Institutions – Special Schemes – Key Financial Indicators – Ratios

Teaching-Learning Process	**ICT and digital support**: Power point presentations to explain the concepts of project finance and available schemes.

Module-4

Private Sector Participation

Private sector participation in Infrastructure Development Projects - BOT, BOLT, BOOT - Technology Transfer and Foreign Collaboration - Scope of Technology Transfer.

Teaching-Learning Process	**Collaborative method:** Case studies of various infrastructure project to understand the type of the project and dealing with projects having foreign collaboration.

Module-5

Report

Students must study and submit a Journal review/ Net study/ live study on any of the topics outlined in the syllabus

Teaching-Learning Process	**Collaborative method:** Students can work in groups to submit journal review.

Assessment Details (both CIE and SEE):

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of 20 Marks (duration 01 hour 30 min)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 13th week of the semester

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for 20 Marks(duration 01 hours)

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be scaled down to 50 marks

Semester End Examination:

1. The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.

2. The Viva-voce will be evaluated by two external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.

3. The viva-voce marks awarded for Dissertation Stage -I, shall be based on the evaluation of synopsis submission, presentation skill and performance in Question-and-Answer session in the ratio 30:10:10.

3. The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

Suggested Learning Resources:

Books

39. Barcus, S.W. and Wilkinson.J.W., "Hand Book of Management Consulting Services", McGraw Hill, New York, 1986.
40. Joy P.K., "Total Project Management - The Indian Context", New Delhi, Macmillan India Ltd., 1992
41. Prasanna Chandra, "Projects – Planning, Analysis, Selection, Implementation Review", McGraw Hill Publishing Company Ltd., New Delhi. 2006.
42. "United Nations Industrial Development Organization (UNIDO) Manual" for the Preparation of Industrial Feasibility Studies, (IDBI Reproduction) Bombay, 1987.
43. Harold Kerzner (2013), Project Management: A Systems Approach to Planning, Scheduling, and Controlling , Wiley India, New Delhi
44. Mohamed Hegab (2014), Public Private Partnerships for Highway Projects: Project Selection and Decision Analysis, Create space Independent Publisher, USA.
45. Jeffery delmon (2016), Private Sector Investment in Infrastructure: Project Finance, PPP Projects and PPP Frameworks, Kluwer Law International.

Web links and Video Lectures (e-Resources):

1. NPTEL LECTURE: Project appraisal
https://youtu.be/IOn-erkINAo
https://youtu.be/2Ow8JUgRC1Q
2. NPTEL LECTURE: Project Finance
https://youtu.be/KCoytFTpHdk

Skill Development Activities Suggested

- Prepare detailed case study about different metros, highways, high rise buildings, Port construction etc., related to infrastructure development.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Illustrate the process of various feasibility studies required for project formulation	L4
CO2	Describe the project cash flows and concepts of time value of money	L2
CO3	Appraise the selection of projects through payback period calculations	L4
CO4	Identify the PPP model and understand the stakeholders and their roles	L2

Program outcome of the course

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction ProjectManagement.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional qualitygraphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resourcesmanagement and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural,ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COS and POS:

	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO 8
CO1	**H**	**L**	**L**	**L**	**H**	**H**	**M**	**H**
CO2	**H**	**M**	**L**	**H**	**H**	**M**	**M**	**M**
CO3	**H**	**L**	**L**	**H**	**H**	**H**	**M**	**M**
CO4	**H**	**H**	**L**	**M**	**H**	**H**	**M**	**H**

H – High , M – Medium, L - Low

II –SEMESTER Elective-2

FUNCTIONAL EFFICIENCY OF BUILDING			
Course Code	**MCPM215B**	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	02:00:02	SEE Marks	00
Total Hours of Pedagogy	48	Total Marks	100
Credits	03		

Course Learning objectives:

- To know the concepts of climatic behaviour on the building.
- To study different shading devices available to avoid penetration of solar radiation in buildings.
- To know the fundamentals of ventilation, wind effects on buildings.
- To study basics of acoustics and design consideration for treatment in lecture halls, Theatres etc.
- To familiarize about Indian Green Building Council , LEED and its rating system.

Module-1

THERMAL BEHAVIOUR OF BUILDINGS: Introduction to concept of Effective Temperature – Corrected Effective Temperature – Procedures- Comfort zone – Overheated Period – design of shading devices – resistance and conductance – transmittance – thermal gradient – Periodic heat flow – Time lag and decrement factor – Procedures - Thermal exchange in buildings –Building heat gain and heat loss.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-2

PLANNING FOR VENTILATION: Functions of ventilation – Stack effect – calculations – provision for Air movement – air flow through buildings– calculation of indoor air velocity – ventilation rate - orientation, external features, cross ventilation – position of openings, size of openings, controls of openings- calculations- air flow around buildings – humidity control.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same* ***Blended learning:*** *Power point presentation and webinars.*

Module-3

DAYLIGHTING: Principles of light- transmission, reflection, and absorption – illumination – day lighting concepts - day lighting in the tropics – daylight requirements – daylight protractor – calculations – distribution of daylight.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-4

ACOUSTICS: Acoustic considerations in Open plan offices, Lecture rooms, Lecture Halls, Seminar halls, Recording Studios, Broadcasting studios, Opera House, Worship places. Acoustic considerations in ancient theatres, basic theatre stages, performance spaces and types. Design principles for Auditoriums- side wall, rear wall & ceiling treatment, sound reinforcing systems home theatres, digital media auditorium & auditorium for the future.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same*

	Blended learning: *Power point presentation and webinars.*

Module-5

GREEN BUILDINGS: Indian Green Building Council, Green Building Moment in India, Benefits Experienced in Green Buildings, Launch of Green Building Rating Systems, Residential Sector, Market Transformation; Green Building Opportunities and Benefits: Opportunities of Green Building, Green Building Features, Material and Resources, Water Efficiency, Optimum Energy Efficiency, Typical Energy Saving Approach in Buildings, LEED India Rating System and Energy Efficiency.

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts, Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same..* ***Blended learning:*** *Power point presentation and webinars.*

Assessment Details (CIE Marks)

The weightage of Continuous Internal Evaluation (CIE) is 100% The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 50% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Three Unit Tests each of 20 Marks (duration 01 hour 30 min)
1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 13th week of the semester

Two assignments each of 10 Marks
4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for 20 Marks(duration 01 hours)
6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks.

Suggested Learning Resources:

Books

- Koenigsberger, O. H., Ingersoll, T. G., Mayhew. A,Szokolay.S.V, Manual of Tropical Housing and Building, Part 1 – Climatic
- Design, Orient Longman Pvt. Ltd, Chennai,2004
- Martin Evans, Housing, Climate and Comfort, Architectural Press, London, 1980
- Arvind Krishnan, Nick Baker, Simons Yannas, S V Szokolay, Climatic Responsive Architecture- A Design Handbook for
- Energy Efficient Buildings, Tata Mc Graw Hill Publishing Company Ltd, New Delhi,2001
-
- BIS, SP 41: Handbook on Functional Requirements of Buildings (Other than Industrial Buildings), 1987
- David Egan. M, Concepts in Thermal Comfort, Prentice Hall, 1975
- Baruch Givoni, Climate considerations in building and urban design, John Wiley & Sons, New York, 1998

Web links and Video Lectures (e-Resources):

Video Tutorial
https://www.youtube.com/watch?v=Rk1OF2qB5Ag&list=PLccFEq6jzqernMuP0HmIsGz37Tm9T7vgO

Web Link
https://cementconcrete.org/building-construction/functional-components-building-structure/3246/

Skill Development Activities Suggested

- Guest Lecture from expert.
- Attending webinars.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Explain the effects of climate and its factors on build environment.	L1
CO2	Describe the fundamentals and concepts of ventilation on built environment	L1
CO3	Describe the fundamentals and concepts of daylighting	L1
CO4	Explain the acoustical treatment for theatres, recording studios and broadcasting studios.	L1
CO5	Summarize the IGBC and LEED building codes for specific building typologies	L2

Program Outcomes of the CPM Program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COS and POS

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**H**	**0**	**L**	**L**	**0**	**0**	**M**	**0**
CO2	**H**	**0**	**L**	**L**	**0**	**0**	**M**	**0**
CO3	**H**	**0**	**L**	**L**	**0**	**0**	**M**	**0**
CO4	**H**	**0**	**M**	**L**	**0**	**0**	**M**	**0**
CO5	**H**	**L**	**M**	**L**	**0**	**0**	**M**	**0**

H – High , M – Medium, L - Low

II-SEMESTER (Elective 2)

INTERNATIONAL PROJECT MANAGEMENT			
Course Code	MCPM215 C	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	02:00:2	Viva Marks	00
Total Hours of Pedagogy	48	Total Marks	100
Credits	03		

Course Learning objectives:

- To know the concepts of international project management and studying the process of evaluating A country's Risk.
- To familiarize about Time, cost, and scope in international projects.
- To familiarize about leadership in international projects.
- To give an overview about communication and staffing strategies.
- To know the methods to undertake stakeholder's analysis.

Module-1	
Introduction to International Project Management, Evaluating of Country Risk and its impact on Project Selection and Management	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*
Module-2	
Managing Time, Cost, Scope and Quality Benefits and Risk in International Projects	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*
Module-3	
Leadership of International Projects	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*
Module-4	
Managing, Communication and Controlling International Projects, Recruitment and Staffing of International Projects	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*
Module-5	
The Wider Context of Stakeholder Analysis in International Projects. Cross-Cultural teamwork and leadership team.	

Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Assessment Details (CIE and Viva voce)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for viva-voce examination is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in viva voce examination is 50% of the maximum marks. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and viva voce marks taken together..

Continuous Internal Evaluation:

CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report.

Semester End Examination:

1. The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.

2. The Viva-voce will be evaluated by external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.

3. The viva-voce marks awarded for PEC (Professional elective course), shall be based on the evaluation of report submission, presentation skill and performance in Question-and-Answer session in the ratio 30:10:10.

4. The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

Web links and Video Lectures (e-Resources):

Video Tutorial
https://www.youtube.com/watch?v=ZRaZVLRXctU

Web Link
https://www.henryharvin.com/blog/what-is-international-project-management/

Skill Development Activities Suggested

- Guest Lecture from expert.
- Attending webinars.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Describe about international project management and ways to evaluate a country's Risk	L1
CO2	To interpret the time, cost and quality of a project and identifying the potential risks	L2
CO3	Describe the leadership principles for international projects	L1
CO4	Explain the methodology to manage communication, recruitment and staffing for International projects.	L1
CO5	Describe about stakeholder analysis in international projects and leadership.	L1

Program Outcomes of the CPM Program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional-qualitygraphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resourcesmanagement, and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs, values, and systems of society and providingsustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, and environmental concerns.	PO6
7	Ability to do independent/option-based research and explore advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COS and POS

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO1	**H**	**M**	**L**	**0**	**0**	**0**	**L**	**L**
CO2	**H**	**O**	**L**	**M**	**0**	**0**	**L**	**L**
CO3	**H**	**M**	**0**	**L**	**0**	**0**	**L**	**L**
CO4	**H**	**M**	**0**	**L**	**0**	**0**	**L**	**L**
CO5	**H**	**M**	**L**	**L**	**L**	**0**	**L**	**L**

H – High , M – Medium, L - Low

II semester

PM SOFTWARES II			
Course Code	**MCPML 206**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	00:02:01	Term work	50
Total Hours of Pedagogy	28	Total Marks	100
Credits	03		

Course Learning objectives:

- To know the work environment of Primavera
- To create a project template and assign a calendar.
- To Create a work breakdown structure.
- To develop resources for project and assign them to activities and manage the resources.
- Prepare a project baseline and compare them with actual progress.

Module-1	
Introduction to Primavera and its frame work Data, Navigating, and Layouts Enterprise Project Structure Creating a Project Creating a Work Breakdown Structure.	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*
Module-2	
Adding Activities Creating Relationships Scheduling Assigning Constraints.	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*
Module-3	
Maintaining the Project Documents Library Formatting Schedule Data, Roles and Resources Assigning.	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*
Module-4	
Assigning Resources and Costs Analyzing, Resources Optimizing the Project Plan	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Module-5

Baselining the Project Plan, Project Execution and Control Reporting Performance	
Teaching-Learning Process	***Direct method****: Lecture supported by conventional method of Blackboard and chalk to introduce the concepts. , Discussions, Debate, Industry interactions, and research paper/news paper reading and inferences from the same.* ***Blended learning:*** *Power point presentation and webinars.*

Assessment Details (Viva voce)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 50% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report.

Viva voce Examination:

1. The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD

.

2. The term work will be evaluated by external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.

3. The term work marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

Suggested Learning Resources:

Books

- Harris, P.E., 2016.Planning&*ControlUsingOraclePrimaveraP6 Versions 8, 15 & 16 PPM Professional*. Eastwood Harris Pty Ltd.
- Winter, R.M., 2003.Construction Scheduling with Primavera Project Planner. *Cost Engineering*, *45*(10), p.24.
- Williams, D.L., 2012.Oracle primavera P6Version8: Project and portfolio management. Packt Publishing Ltd.
- Kelly, S.D., 2012.Oracle Primavera Contract Management BiVersion14.PacktPublishing Ltd.

Web links and Video Lectures (e-Resources):

Video Tutorial
https://www.youtube.com/watch?v=c6GbkT10hZ8

Web Link
https://mindmajix.com/primavera-p6-tutorial

Development Activities Suggested

- Guest Lecture from expert.
- Attending webinars.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understand the Primavera software environment	L1
CO2	Develop project plan and assign calendars.	L6
CO3	Develop tasks and create work breakdown structure	L6
CO4	Create resources and modify it.	L6
CO5	Modify the project plan to reach the targets and create project baselines	L6

Program Outcomes of the CPM Program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COS and POS

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**H**	**M**	**L**	**H**	**0**	**L**	**L**	**0**
CO2	**H**	**0**	**L**	**H**	**0**	**L**	**L**	**0**
CO3	**H**	**0**	**L**	**H**	**0**	**L**	**L**	**0**
CO4	**H**	**0**	**L**	**H**	**0**	**0**	**L**	**0**
CO5	**H**	**0**	**L**	**H**	**0**	**0**	**L**	**0**

H – High , M – Medium, L - Low

II Semester

DISSERTATION PHASE- 1			
Course Code	MCPM287	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	01:00:01	Viva Marks	50
Total Hours of Pedagogy	16	Total marks	100
Credits	2	Exam hours	---

Course Learning objectives:

- The objective of the dissertation is to provide an opportunity to the students to prepare independent and original study of a special project of his/her own choice.
- The project provides students an opportunity for academic research to cultivate specialization in the areas of their own interest under the overall guidance of the faculty.
- The objective of the seminar work is to train the students to prepare state of art report by assimilation of concepts / ideas on a chosen topic in the area of Building Engineering and Management.

COURSE CONTENT

Dissertation Stage-1: Students in consultation with the guide/s shall carry out literature survey/ visit industries to finalize the topic of the Project. Subsequently, the students shall collect the material required for the selected project, prepare synopsis and narrate the methodology to carry out the project work.

Students in consultation with the guide/co-guide if any, shall pursue literature survey and complete the preliminary requirements of selected Project work. Each student shall prepare relevant introductory project document, and present a seminar

Seminar:

Each student, under the guidance of a faculty, is required to

- Present the seminar on the selected project orally and/or through power point slides.
- Answer the queries and involve in debate/discussion.
- Submit two copies of the typed report with a list of references.

The participants shall take part in discussion to foster friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident.

Teaching-Learning Process	1. Guest lectures, webinars, site visits to acquire subject knowledge related to the selected topic. 2. Critical review with constructive suggestions / feed backs has to be provided by the Guide/ co-guide during the progress of the dissertation.

Assessment Details (both CIE and viva-voce):

The weightage of Continuous Internal Evaluation (CIE) is 50% and for viva-voce examination is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in viva voce examination is 50% of the maximum marks. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and viva voce marks taken together.

Continuous Internal Evaluation:

CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for Dissertation Stage -1, shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the synopsis of the Dissertation topic finalized.

Viva-voce Examination:

1. The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.
2. The Viva-voce will be evaluated by two external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.
3. The viva-voce marks awarded for Dissertation Stage -I, shall be based on the evaluation of synopsis submission, presentation skill and performance in Question-and-Answer session in the ratio 30:10:10.
3. The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

Suggested Learning Resources:

Books

36. Ranjith Kumar (2005.) Research Methodology- A step by step guide for beginners, California: Sage Publications.
37. John W Creswell, (2002). Research design: Qualitative, Quantitative and Mixed method approaches. California: Sage Publications.
38. Kate Turabian. (2018) A Manual for Writers of Research Papers, Theses, and Dissertations. Chicago: Chicago Guides to Writing, Editing, and Publishing.

Web links and Video Lectures (e-Resources):

- Thesis Format | Dissertation Format | Paper, Structure, Sample | Leverage Edu

Skill Development Activities Suggested

- Guest lecture
- Review of research papers
- Site visits

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	summarize an extensive literature study and data collection from the field and presentation in the form of drawings, relevant details/codes, schematic charts, reports and photographs	L5
CO2	Propose problem identification, formulation, and solution.	L6
CO3	Develop a sound technical knowledge of their selected project topic.	L3
CO4	Design engineering solutions to complex problems utilising a systems approach.	L6

Program Outcome of this course :

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	PO3
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns.	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	**H**	**H**	**H**	**H**	**M**	**M**	**M**	**H**
CO2	**H**	**H**	**H**	**M**	**H**	**H**	**H**	**H**
CO3	**H**	**M**	**H**	**H**	**H**	**M**	**M**	**H**
CO4	**H**	**H**	**L**	**L**	**M**	**M**	**H**	**H**

H – High , M – Medium, L - Low