Government of Karnataka
Department of Technical Education

PROJECT MANAGEMENT SKILLS

(REVISED C-20 SYLLABUS)

2024-25

Government of Karnataka
DEPARTMENT OF COLLEGIATE & TECHNICAL EDUCATION

Program	Common to All Programs	**Semester**	II
Course Name	Project Management Skills	**Type of Course**	Activity based study
Course Code	20PM01T	**Contact Hours**	6 Hrs Per Week (2 Theory + 4hrs of class room activities) 78 Hrs Per Semester
Teaching Scheme	L: T: P - 26-00-52	**Credits**	4
CIE Marks	50	**SEE Marks**	100

1. Rationale:

Project Management is a confluence of Management principles and Engineering subject area. This course enables the students to develop conceptualization of Engineering Management principles and apply the same for their engineering projects, in their domains, example, Software Development project or Construction Project and so on. The course integrates three core areas of Planning, Execution and Auditing of Projects.

2. Course Skill Set

Student will be able to:

1. Understand what constitutes a project, Plan for the execution of the project by breaking into manageable work units, and Prepare necessary project artifacts.
2. Track and control the Project while preparing verifiable records for Project Inspections and Audits
3. Inspect and Audit projects for Milestone or other project completion criteria and other metrics, Defects and remediation, Project learnings
4. Gain knowledge and develop curiosity on latest technology trends in Project management

3. Course Outcomes: *At the end of the Course, the student will be able to:*

CO1	Apply the concepts of Project Management to real projects which are expressed in the form of the Project reports or Engineering drawings
CO2	Estimate Project resources needed–Time, Material and Effort, and Plan for execution
CO3	Understand, analyze and assess the risks involved in a project and plan for managing them
CO4	Use Project Management Tools and processes to track and control Projects

CO5	Conduct inspection of Projects and audit progress and bills
CO6	Understand the Digital Technology trends in Project management and concepts like Smart cities

4. Suggested specification table with Hours & Marks

UNIT NO	UNIT TITLE	TEACHING HOURS (L-T-P)	TOTAL
1	Introduction	02-00-04	15
2	Project Administration	06-00-12	30
3	Project Life cycle	04-00-08	25
4	Project Planning, Scheduling and Monitoring	06-00-12	30
5	Project Control, Review and Audit	06-00-12	30
6	Digital Project Management	02-00-04	15
	Total	**26-00-52=78**	**145**

5. Course Content: - *The following topics / sub topics is to be taught and assessed in order to develop Unit Skill sets for achieving CO to attain identified skill sets.*

UNIT NO	UNIT TITLE	Unit skill set (In cognitive domain)	Topics/ Subtopics	Hours L-T-P
1	Introduction	Use Basic Science, Maths skills to understand Project management and project planning, execution and control.	Introduction and definition, Features of a Project, Types of Projects, Benefits and Obstacles in Project Management, Role of Project manager, Consultants, Project and Operation, Project Management Process, Project Scope and objectives	02-00-04
2	Project Administration	Able to develop WBS, PEP and PM processes for Project with given inputs	Project Administration, Project Team, Project Design, Work Break down Structure (WBS), Project Execution Plan (PEP), Project Procedure Manual and Project Dairy, Project Execution system, Prerequisites of successful project implementation (Listing) **Case Study 1**	06-00-12
3	Project Life cycle	Use project administration and project life cycle knowledge to Assess and plan for project risk	Project Life Cycle – Project Initiation, Project Planning, Project Execution, Project Closure, Project Risks, Time Overrun and Cost over runs. **Case Study 2**	04-00-08

4	Project Planning, Scheduling and Monitoring	Able to develop a detailed project plan given the inputs on manpower, funds availability and time availability	Project Planning Function, Structure, Project Scheduling, Project monitoring and Project evaluation. **Case Study 3**	06-00-12
5	Project Control, Review and Audit	Use Project Management life cycle knowledge to Control project parameters, review and audit project performance	Project Control, Problems of Project Control, Gantt Charts, Milestone Charts, Critical Path Method (CPM), Network Technique in Project Scheduling, Project Review, Initial Review, Project Audit. **Case Study 4**	06-00-12
6	Digital Project Management	Understand latest trends of digital technologies impacting the domain of project management and application of the same in multiple scenario	Digital Technology trends in Project management, Cloud Technology, IoT, Smart cities. **Case study 5**	02-00-04

6. Detailed Course Content: -

UNIT NO	UNIT TITLE	DETAILED COURSE CONTENT	CONTACT HRS
1	Introduction	1.1 Introduction 1.2 Meaning of Project 1.3 Definition of Project 1.4 Features of a Project 1.5 Types of Projects 1.6 Benefits of Project Management 1.7 Obstacles in Project Management 1.8 Project Manager and His Role 1.9 Project Consultants 1.10 Meaning of Operation 1.11 Difference between Project and Operation 1.13 Process in Project Management 1.14 Project Scope and project objectives	02-00-04
2	Project Administration	2.1 Essentials of Project Administration 2.2 Project Team 2.3 Project Design 2.4 Work Breakdown Structure(WBS) 2.5 Project Execution Plan(PEP) 2.6 Contracting Plan	06-00-12

		2.7 Work Packing Plan 2.8 Organization Plan 2.9 Systems and Procedure Plan 2.10 Project Procedure Manual 2.11 Project Diary 2.12 Project Execution System – List its forms 2.13 List the Pre-requisites for Successful Project Implementation 2.14 Case Studies	
3	Project Life cycle	3.1 Introduction 3.2 Project Life Cycle – General 3.3 Project Initiation and list the parameters 3.4 Project Planning and list the parameters 3.5 Project Execution and list the parameters 3.6 Project Closure and list the parameters 3.7 Project Risks 3.8 Types of Risks: Illustrations 3.9 Cost Overruns 3.10 Time Overruns 3.11 Case Studies	04-00-08
4	Project Planning, Scheduling and Monitoring	4.1 Introduction 4.2 Need for Project Planning 4.3 Functions of Project Planning 4.4 Steps in Project Planning 4.5 Project Planning Structure 4.6 Tools of Project Planning 4.7 Project Scheduling 4.8 Problems in Scheduling Real-life Projects 4.9 Introduction to project monitoring 4.10 Setting Goals and Objectives 4.11 Introduction to Implementation 4.12 Project Evaluation and its importance 4.13 Challenges in Monitoring and Evaluation. 4.14 Case Studies	06-00-12
5	Project Control, Review and Audit	5.1 Introduction to Project control 5.2 Projected Control Purposes 5.3 Problems of Project Control 5.4 Gantt Charts 5.5 Milestone Charts 5.6 Critical Path Method (CPM) 5.7 Construction of a Network 5.8 Network Technique in Project Scheduling (PERT)	06-00-12

		5.9 Project Review 5.10 Initial Review and its types 5.11 Objectives of Project Audit 5.12 Functions of Project Auditor 5.13 Case Studies	
6	Digital Project Management	6.1 Digital Technology trends in Project management 6.2 Cloud Technology, IoT, AR and VR applications in Project management, Smart Cities 6.3 Case Studies	02-00-04

7. Suggested Reference Books:

Sl. No.	Author	Title of Books	Publication/Year
1.	Dr. Lalitha Balakrishnan & Dr. Gowri Ramachandran	Project Management	Himalaya Publishing,2019
2.	Shailesh Kumar Shivakumar	Complete Guide to Digital Project Management	Apress,2019
3.	Prasanna Chandra	Project planning, analysis, selection, implementation and review	Tata McGraw Hill
4.	Gopala Krishnan	Project Management	Mcmillan India Ltd.

8. CIE and SEE Assessment Methodologies- (Theory)

Sl. No	Assessment	Duration (minutes)	Max marks	Conversion
1.	CIE Assessment -1 (Written Test-1) At the end of 3rd week	80	30	Average of all **CIE =30 Marks**
2.	CIE Assessment- 2 (Written Test-2) At the end of 7th week	80	30	
3	CIE Assessment - 3 (Written Test-3) At the end of 13th week	80	30	
4	CIE Assessment 4 (Group Assignment-1) At the end of 5th week	60	20	Average of all **CIE =20 Marks**
5	CIE Assessment 5 (Group Assignment 2) At the end of 9th week	60	20	
6	CIE Assessment 6 (Individual Student activity/ Assignment) At the end of 11th week	60	20	
Total Continuous Internal Evaluation (CIE)				**50 Marks**
Semester End Examination (SEE) -Theory		180	100	**50 marks**
Total				**100 Marks**

Note:

1. SEE (Semester End Examination) is conducted for 100 Marks theory course for a time duration of 3 Hrs
2. Three CIE (written test), each of 30marks for a time duration of 80 minutes shall be conducted. Also, three CIE (MCQ or Quiz/Group Assignment/ Individual student activity or assignment) each of 20marks for the time duration of 60 minutes shall be conducted. Any fraction at any stage during evaluation will be rounded off to the next higher digit.

3. Assessment of assignment and student activity is evaluated through appropriate rubrics by the respective course coordinator. This secured mark in each case is rounded off to the next higher digit.

9. Instructional Strategy

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes

1. Explicit instruction will be provided in intervention classes or by using different differentiation strategies in the main classroom.
2. Lecturer method (L) does not mean only traditional lecture method, but different type of teaching method and media that are employed to develop the outcomes.
3. Observing the way their more proficient peers use prior knowledge to solve current challenges and persevere in problem solving will help struggling students to improve their approach to engaging with rich contextual problems.
4. Topics be introduced always with a real life example and then answering what, how, why and when.
5. The teacher is able to show different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
6. In a perfect world, teacher would always be able to demonstrate how every concept can be applied to the real world-and when that's possible, it help to improve the students 'understanding. When a concept cannot be applied in that manner, we can still share how it might be applied within mathematics.

10. Mapping of CO with PO

CO	Course Outcome	PO Mapped	UNIT Linked	CL R/U/A	Sessions in Hrs	Total Marks
CO1	Understand the concepts of Project Management in relation to real projects which are expressed in the form of the Project reports or Engineering drawings	1,2,5,7	1, 2	R/U/A	06	15
CO2	Estimate Project resources needed –Time, Material and Effort, and Plan for execution **Case study–1**	1,2,3,7	2,3	R/U/A	18	30
CO3	Evaluate the risks involved in a project and Plan for managing them **Case Study -2**	1,2,3,7	2,3	R/U/A	12	25
CO4	Use Project Management methods with Tools and/or processes to track and control Projects **Case Study – 3**	1,4,6,7	4	R/U/A	18	30

CO5	Conduct inspection of Projects and audit progress and bills **Case Study- 4**	1,2,5,7	5	R/U/A	18	20
CO6	Understand the Digital Technology trends in Project management, and Engineering Industries **Case Study - 5**	1,5,7	6	R/U/A	06	15
					78	**145**

COURSE	**CO's**	**(PO Programme Outcomes)**						
		1	**2**	**3**	**4**	**5**	**6**	**7**
Project Management Skills	CO1	3	3	0	0	2	0	1
	CO2	3	3	3	0	0	0	1
	CO3	3	0	0	3	0	3	1
	CO4	3	0	0	3	0	3	1
	CO5	3	2	0	0	2	0	1
	CO6	3	0	0	0	2	0	2
Level 3- Highly Mapped, Level 2- Moderately Mapped, Level 1- Low Mapped, Level 0- Not Mapped								

Case Studies:

Note:

- The Couse coordinator can either use the following Case studies and activities or design on their own, with the overall learning outcomes being met.
- The Course coordinator should use general case studies.

Case Study 1: Assume you are a member of student association. You are given the responsibilities to organize the college fest.

Requirements:

1. There are 500 students in the college and 50 staffs.
2. There are some activities to be conducted such as Cultural, Sports, Exhibition etc...
3. Food arrangements for the students and staff.
4. Stage has to be setup.
5. Prize distribution on college fest day.

Tasks:

- Split the class into groups of three or five.
- Prepare the detailed WBS.
- Prepare the detailed Project execution plan.
- Estimate the budget for the entire activity.
- Present it in a seminar, with each group getting 5-10 minutes to present their idea.

Note: For case study 1 other similar topics can be used, such as

1. Ayudha Pooja celebration – Program wise.
2. Computer Laboratory setup for your programme. Etc..

Case Study 2: Assume you are organizing a 5-day educational trip.

Requirements:

1. There are 30 students in the trip and 2 staffs accompanying them.
2. Mode of transport to be decided.
3. Food arrangements has to be made for the students and staff.
4. Accommodation has to be made for the students and staff.
5. Emergency (First-Aid) Medical arrangements has to be made.

Tasks:

- Prepare the detailed WBS.
- Prepare various phases of the project according to the project life cycle and duration.
- Prepare the project dairy template.
- Prepare the project plan with risks involved and management of the risk.

- Estimate the budget for the entire activity.
- Discuss the reasons of Cost and Time overrun if project is delayed.
- Present it in a seminar, with each group getting 5-10 minutes to present their idea.

Case Study 3: Assume that you are organizing a one-day intercollege student Debate competition at your institution.

Requirements:

1. 2 participants and 1 staff member from about 50 colleges across state.
2. Judges are to be identified.
3. Budget plan for Food, Accommodation and Prizes has to be made.
4. Stage and seating arrangement should be considered.

Task:

- Estimate (**Plan**) the budget for the entire activity
- Prepare the **schedule** chart for the entire activity (any planning tools can be used).
- Give a detailed **monitoring** report as per the scheduled chart.
- Present it in a seminar, with each group getting 5-10 minutes to present their idea.

Case Study 4: A company is started a new project with several activities. The project involves 5 activities.

Activity Identification and Sequencing:

- Activity A: (Duration: 5 days)
- Activity B: (Duration: 10 days, follows Activity A)
- Activity C: (Duration: 15 days, follows Activity B)
- Activity D: (Duration: 12 days, follows Activity C)
- Activity E: (Duration: 8 days, follows Activity D)

Dependencies:

- Activity A must precede Activity B (Finish to Start dependency).
- Activity B must precede Activity C.
- Activity C must precede Activity D.
- Activity D must precede Activity E.

Construct a network diagram, Identify the critical path and determine the Total project duration.

Case Study 5: Suggested list of case studies/activities are -

1. Take a **case study** on how AR been implemented in educational institution to enhance learning experiences. Provide a specific example of a case where AR improved student engagement and

understanding and prepare 3-page article.

2. Describe a case where VR technology has been used for medical field. List the outcomes and benefits observed and report the findings.

3. **Case study** – A Smart city project impacts social aspects such as education, healthcare, or community well-being. Provide specific examples of initiatives that addressed social challenges and report the findings.

4. **Case study** - XYZ Farm is a 100-acre farm specializing in various agricultural production methods. Facing challenges with unpredictable weather patterns and resource management, the farm planning to integrate IoT technologies to improve operational efficiency and sustainability. Report the challenges, IoT technologies and expected outcomes for the given case study.

CIE Theory Test – Model Question Paper

Program				**Semester II**	
Course Name	**PROJECT MANAGEMENT SKILLS**			**Test**	
Course Code	**20PM01T**	**Duration**	**80 Min**	**Marks**	**25**
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					

Q. No	**Questions**	**Cognitive Level**	**Course Outcome**	**Marks**
	Section - 1			
1	a. List the characteristics of project manager b. Differentiate between Project and Operation	R A	CO1	5 5
2	a. List the features of Project. b. Differentiate between Project scope and project Objectives	R A		5 5
	Section - 2			
3	a. Explain project dairy with advantages b. Discuss the factors to be considered while selecting the group member.	U A	CO2	5 5
4	a. List and explain Project teams b. Differentiate between Effective team and Ineffective team	U A		5 5
	Section - 3			
5	Develop a Work breakdown structure for the College fest celebration.	A	CO2	10
6	Develop a Work breakdown structure for the College sports meet.	A		10
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.				

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

SEE –Model Theory Question Paper - 1

CODE: 20PM01T

II Semester Diploma Examinations

PROJECT MANAGEMENT SKILLS

Time: 3 Hours] **[Max Marks: 100**

Note: *i) Answer any SIX questions from Section – 1. Each question caries 5 marks.*
ii) Answer any SEVEN full questions from Section- 2. Each question caries 10 marks.

Q No	Questions	Marks
	Section -1	
1	Differentiate between Project and Operation.	5
2	List the types of project and explain any one type of projects.	5
3	List any five prerequisites for successful project implementation.	5
4	Define Project team. List any 3 types of a project team.	5
5	Explain Project Management Life cycle.	5
6	Write any five functions of Project planning.	5
7	Explain SMART tool in goals and objectives in Monitoring.	5
8	What is Project Review? List its objectives.	5
9	Discuss any 5 applications of IoT.	5
	Section -2	
10	a. Describe the need and functions of project consultants. b. Write any 5 differences between PERT and CPM	5 5
11	a. Write a note on Project Execution Plan (PEP)? List its 4 Sub-plans b. Mention any 4 advantages of project dairy.	6 4
12	a. Develop a Work breakdown structure for the construction of a college building b. What do you mean by Work Breakdown structure? List any 2 advantages of WBS	7 3
13	a. Define Risk. Explain any 3 types of Risks. b. List any 3 roles of Project manager to minimize risk in the project	7 3
14	a. A family trip was planned for 3 days with a budget of Rs. 20,000 / - However the actual expenditure was Rs 30,000/-. State the possible reasons for increase in the cost of expenditure. b. Write a short note on Time Overrun	7 3
15	a. John is managing a project which is to be completed in 18 months. During the planning phase, he created a detailed project plan that included the schedule, budget, resource allocation, and quality management plan. John used Gantt charts to visualize the timeline and dependencies of various tasks. He also set up regular status meetings to track progress and make	6

<table>
<tr><td></td><td>adjustments as needed.
Answer the following Questions:
Q1: What tools did John use to visualize the project timeline and dependencies?
Q2: Why are regular status meetings important in project management?
Q3: What key components were included in John's detailed project plan?

b. List any four Tools used in Project Planning</td><td>4</td></tr>
<tr><td>16</td><td>a. Determine the expected time for the following activities
<table><tr><th rowspan="2">Activity</th><th colspan="3">Estimated duration in days</th></tr><tr><th>Optimistic</th><th>Most Likely</th><th>Pessimistic</th></tr><tr><td>1 - 2</td><td>2</td><td>5</td><td>8</td></tr><tr><td>1 - 3</td><td>4</td><td>10</td><td>16</td></tr><tr><td>1 - 4</td><td>1</td><td>7</td><td>13</td></tr><tr><td>2 - 5</td><td>5</td><td>8</td><td>11</td></tr><tr><td>3 - 5</td><td>2</td><td>8</td><td>14</td></tr><tr><td>4 - 6</td><td>6</td><td>9</td><td>12</td></tr><tr><td>5 - 6</td><td>4</td><td>7</td><td>10</td></tr></table>
b. Write the importance of Project Evaluation</td><td>7

3</td></tr>
<tr><td>17</td><td>Develop a network diagram for a project whose activities and preceding activities with duration are given below
<table><tr><th>Activity</th><th>Predecessor</th><th>Duration (Days)</th></tr><tr><td>A</td><td>–</td><td>3</td></tr><tr><td>B</td><td>A</td><td>4</td></tr><tr><td>C</td><td>A</td><td>2</td></tr><tr><td>D</td><td>B</td><td>5</td></tr><tr><td>E</td><td>C</td><td>1</td></tr><tr><td>F</td><td>C</td><td>2</td></tr><tr><td>G</td><td>D, E</td><td>4</td></tr><tr><td>H</td><td>F, G</td><td>3</td></tr></table></td><td>10</td></tr>
<tr><td>18</td><td>a. State any 5 purpose of project control
b. Write any 5 functions of project auditor.</td><td>5
5</td></tr>
<tr><td>19</td><td>a. List any 5 the differences between Augmented Reality (AR) and Virtual Reality (VR)
b. Write the applications of Cloud Technology in Project Management.</td><td>5

5</td></tr>
</table>

SEE –Model Theory Question Paper - 2

CODE: 20PM01T

II Semester Diploma Examinations

PROJECT MANAGEMENT SKILLS

Time: 3 Hours] **[Max Marks: 100**

Note: *i) Answer any SIX questions from Section – 1. Each question caries 5 marks.*
ii) Answer any SEVEN full questions from Section- 2. Each question caries 10 marks.

Q No	Questions	Marks
	Section -1	
1	Define Project. List any 3 features of a project.	5
2	List and explain the types of consultants.	5
3	Identify any five advantages of effective team.	5
4	Define project administration and list any 3 tools used in project administration.	5
5	Explain Project Life Cycle curve with neat diagram	5
6	Write any 3 advantages and 2 disadvantages of Network techniques	5
7	Explain three time estimates used for project planning.	5
8	What is CPM? Write any 3 objectives of CPM	5
9	Write a note on smart city project.	5
	Section -2	
10	a. List any 5 Obstacles in Project management. b. Write a note on Initial review in a project.	5 5
11	List the types of project teams. Explain any 3 project teams	10
12	a. Develop a Work breakdown structure for the birthday celebration using the following first level activities as Invitation, Food, Shopping. b. Write a short note on Project Procedure Manual	6 4
13	a. XYZ company is supposed to develop a customized two wheelers for a customer. Identify and explain different types of risks involved in the project. b. Discuss the Project closure phase in Project Life Cycle.	7 3
14	a. A Logistic company was planned to deliver the goods within 3 days. However, it took 5 days. State the possible reasons for delaying the delivery of goods b. Write a short note on Cost Overrun.	7 3
15	a. Construct Gantt chart for the following.	6

Jobs	Start time	Duration	Manpower
1	0	5	8
2	1	3	7
3	4	4	6
4	8	6	3

b. Draw the structure of Project Planning. — 4

16

a. Determine the expected time for the following activities. — 6

Activity	Time estimate		
	t_0	t_m	t_p
1 – 2	9	12	21
1 – 3	6	12	18
2 – 4	1	1.5	5
3 – 4	4	8.5	10
2 – 5	10	14	24
4 – 5	1	2	3

b. Write any 4 purpose of Project Scheduling. — 4

17

a. Construct the Network diagram and find the Critical path for the following data — 10

Task	Predecessor(s)	Duration (days)
A	None	1
B	None	1
C	A	5
D	B	1
E	B	1
F	D	6
G	E	4
H	F	2
I	G	1
J	G	1
K	I	3
L	J	3
M	C	1
N	M	1

18

a. Explain Milestone chart in Project Control. — 5
b. Write any 5 objectives of project Audit. — 5

19

a. Write any 5 applications of AR and VR technologies. — 5
b. Write any 5 benefits of IoT — 5