

COURSE PLAN & COURSE DATA SHEET

PROGRAM: BCA	DEGREE: UG
COURSE: Software Project Management	SEMESTER: VI CREDITS: 3
COURSE CODE: BCA - 302 REGULATION: NA	COURSE TYPE: CORE
COURSE AREA/DOMAIN: IT	CONTACT HOURS: 3+1 (Tutorial) hours/Week.
CORRESPONDING LAB COURSE CODE (IF ANY): NA	LAB COURSE NAME (IF ANY): NA

PROGRAM EDUCATIONAL OBJECTIVES:

- Gain a thorough understanding of all phases of the software development lifecycle (SDLC), from conception to deployment and maintenance.
- Develop strong project management skills, including planning, scheduling, resource allocation, and budgeting, tailored to software development projects.
- Learn techniques for ensuring software quality and managing risks throughout the software project.
- Acquire skills in leading and managing diverse teams, including effective communication, conflict resolution, and motivation techniques.
- Understand and apply various software development methodologies, such as Agile, Scrum, and Waterfall, and know when to apply each.
- Develop abilities to manage stakeholder expectations and communicate effectively with clients, team members, and other stakeholders.
- Gain a solid foundation in the technical aspects of software development to effectively manage projects with a strong understanding of the underlying technology.
- Be able to adapt and stay current with emerging technologies and trends in the software industry.
- Understand the legal and ethical implications in software project management, including intellectual property rights, data privacy, and compliance issues.
- Learn techniques for accurate cost estimation and financial management specific to software projects.
- Develop skills in evaluating project performance using various metrics and tools, ensuring projects meet objectives and deliver value.
- Build awareness and understanding of cultural differences and global trends affecting software development, preparing for work in a globalized environment.

SYLLABUS:

UNIT	DETAILS	HOURS
I	<p>INTRODUCTION: Definition of a Software Project (SP), SP vs. other types of projects activities covered by SPM; categorizing SPs; project as a system; management control, requirement specification; information and control in organization</p> <p>STEPWISE PROJECT PLANNING: Introduction, selecting a project; identifying project scope and objectives; identifying project infrastructure, analyzing project characteristics; identifying project products and activities; estimate efforts each activity; identifying activity risk; allocate resources; review/ publicize plan</p>	7
II	<p>PROJECT EVALUATION AND ESTIMATION: Cost benefit analysis; cash flow forecasting; cost benefit evaluation techniques; risk evaluation; Selection of an appropriate</p>	6

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	<p>project report; Choosing technologies, choice of process model, structured methods: rapid application development, water fall, V-process-, spiral- models; Prototyping;</p> <p>ACTIVITY PLANNING: Objectives of activity planning; project schedule; projects and activities; sequencing and scheduling activities, network planning model; representation of lagged activities; adding the time dimension, backward and forward pass; identifying critical path; activity throat, shortening project; precedence networks;</p>	
III	<p>RESOURCE ALLOCATION AND MONITORING THE CONTROL: Introduction, the nature of resources, identifying resource requirements; scheduling resources creating critical paths; counting the cost; being specific; publishing the resource schedule; cost schedules, the scheduling sequence; Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control</p>	5
IV	<p>MANAGING CONTRACTS AND PEOPLE: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises</p>	8
V	<p>SOFTWARE QUALITY: Introduction; the place of software quality in project planning; the importance of software quality; defining software quality, ISO 9126; Practical software quality measures; product versus process quality management; 46 external standards; techniques to help enhance software quality; Study of any software project management software: viz Project 2005 or equivalent.</p>	10
TOTAL HOURS		36

Teacher Centric Approach			
TC1: Chalk and Talk, Blended learning	TC2: PPT,	TC3: Video Lectures	TC4:
Learner Centric Approach:			
LC1: Assignment.	LC2: Mini project.	LC3: Quiz/Class test.	LC 4: Seminar on recent trends.
LC5: Group Task.	LC6: Others		

DETAILED SESSION PLAN

Lecture session/ Number	Topics to be covered	CO addressed	Teacher Centric Approach	Learner Centric Approach	References	Relevance with POs and PSOs
1	INTRODUCTION: Definition of a Software Project (SP) Engineering, Definition of Software Engineering, Software Components,	1	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
2	SP vs. other types of projects activities covered by SPM	1	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3
3	project as a system; management control, requirement specification	1	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3

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4	information and control in organization	1	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
5	STEPWISE PROJECT PLANNING: Introduction, selecting a project; identifying project scope and objectives	1	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3
6	identifying project infrastructure, analyzing project characteristics; identifying project products and activities	1	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3
7	estimate efforts each activity; identifying activity risk; allocate resources; review/ publicize plan	1	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
8	PROJECT EVALUATION AND ESTIMATION: Cost benefit analysis; cash flow forecasting; cost benefit evaluation techniques	2	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3
9	risk evaluation; Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods: rapid application development, water fall	2	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3

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10	V-process-, spiral-models; Prototyping	2	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
11	ACTIVITY PLANNING : Objectives of activity planning; project schedule; projects and activities; sequencing and scheduling activities	2	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3
12	network planning model; representation of lagged activities; adding the time dimension, backward and forward pass; identifying critical path	2	TC1, TC2	LC3	T1/T2/R1	2
13	activity throat, shortening project; precedence networks	2	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3
14	RESOURCE ALLOCATION AND MONITORING THE CONTROL: Introduction, the nature of resources, identifying resource requirements; scheduling resources creating critical paths; counting the cost; being specific; publishing the resource schedule	3	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3

15	cost schedules, the scheduling sequence	3	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
16	Flow Charts, Coupling and Cohesion Measures	3	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
17	Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring	3	TC1, TC2	LC3	R1/R2/R3	2
18	earned value, prioritizing monitoring, getting the project back to target, change control	3	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	3
19	MANAGING CONTRACTS AND PEOPLE:, Introduction, types of contract	4	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	2
20	stages in contract, placement, typical terms of a contract	4	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	3
21	contract management, acceptance, Managing people and organizing terms: Introduction	4	TC1, TC2	LC1,LC2,LC3,LC4	R1/R2/R3	2
22	understanding behavior, organizational behavior: a back ground	4	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	3
23	selecting the right person for the job	4	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	2

24	motivation, working in groups, becoming a team	4	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	3
25	decision making, leadership	4	TC1, TC2	LC3	R1/R2/R3	2
26	organizational structures, conclusion, further exercises	4	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	2
27	SOFTWARE QUALITY: Introduction	5	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	3
28	the place of software quality in project planning	5	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	3
29	the importance of software quality	5	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	2
30	defining software quality	5	TC1, TC2	LC1,LC2,LC3,LC4	R1/R2/R3	3
31	ISO 9126	5	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	2
32	Practical software quality measures	5	TC1, TC2	LC1,LC2,LC3	R1/R2/R3	2
33	product versus process quality management	5	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
34	46 external standards	5	TC1, TC2	LC3	T1/T2/R1	3
35	techniques to help enhance software quality	5	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3

36	Study of any software project management software viz Project 2005 or equivalent	5	TC1, TC2	LC1,LC2,LC3	T1/T2/R1	2
37	Quiz		TC1, TC2	LC1,LC2,LC3	T1/T2/R1	3

TEXT/REFERENCE BOOKS:

T/R	
1	Bob Hughes and Mike Cotterell, —Software Project Management, 2nd Edition, Tata McGraw Hill, 1999
2	Futrell, —Software Quality & Project Management, Pearson Education, 2002.
3	Jalote Pankaj, Software Project Management, Pearson Education, 2002.
4	Gopalswamy Ramesh, —Managing Global Software Projects, Tata McGraw Hill, 2001
5	Pressman Roger S., —Software Engineering – A Practitioner's Approach, 5th Edition, McGraw Hill, 2001
6	Walker Royce, —Software Project Management, Addison Wesley, 1998
7	Maylor, —Project Management, Third Edition, 2003.
8	Demarco Tom, —Controlling Software Project Management and Measurement, Prentice Hall, 1982 8. Glib Tom and Susannah Finzi, —Principles of Software Engineering Management, Addison Wesley, 1998.

WEB SOURCE REFERENCES (W):

1	Tutorialpoint.com
2	Javapoint.com
3	W3schools.com

COURSE PRE-REQUISITES: Knowledge of software engineering and the basic principles of management

C.CODE	COURSE NAME	DESCRIPTION	SEM
BCA-302	Software Project Management	This course explores methodologies, tools, and techniques for effectively planning, executing, and delivering software projects within budget and time constraints.	VI

COURSE OBJECTIVES:

1	To provide students with a comprehensive understanding of the software project lifecycle, including initiation, planning, execution, monitoring, control, and closure.
2	To equip students with essential project management skills such as scope management, time management, cost management, quality management, and risk management in the context of software projects.
3	To enable students to understand and apply various software development methodologies, both Agile (like Scrum and Kanban) and traditional (like Waterfall), in appropriate contexts.
4	To cultivate leadership skills and the ability to effectively collaborate and communicate within a team, crucial for successful software project management.
5	To familiarize students with the use of software project management tools and techniques, including resource allocation, scheduling tools,

and performance tracking methods.

COURSE OUTCOMES:

S.NO	DESCRIPTION	PO(1..12) MAPPING	PSO(1..3) MAPPING
CO1	Identify the different project contexts and suggest an appropriate management strategy.	PO1, PO2, PO5, PO9	PSO1
CO2	Practice the role of professional ethics in successful software development.	PO3, PO4, PO5, PO6	PSO3
CO3	Identify and describe the key phases of project management.	PO3, PO4, PO5, PO6	PSO3
CO4	Determine an appropriate project management approach through an evaluation of the business context and scope of the project.	PO10, PO11	PSO2, PSO3
CO5	Methods to Maintain the Software Quality Assurance	PO1, PO2, PO5, PO9	PSO1
COURSE OVERALL PO/PSO MAPPING: 2/2			

COURSE OUTCOMES VS POs MAPPING (DETAILED; HIGH:3; MEDIUM:2; LOW:1):

S.NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1			1				1				1		
CO2			2	1	1	2									1
CO3			2	1	1	2									1
CO4										1	1			2	1
CO5					2					1	1			2	
CO1	2	1			1				1				1		

* For Entire Course, PO & PSO Mapping

POs & PSO REFERENCE:

PO 1	Apply the knowledge of mathematics, science, engineering and Application fundamentals, and an engineering and Application specialization to the solution of complex engineering problems.	PO7	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	PSO1	To equip the students with theoretical and implementation knowledgebase in all the latest areas of Computer Science & Engineering for a successful career in software industries, pursuing higher studies, or entrepreneurial establishments.
PO	Identify, formulate, research	PO8	Apply ethical principles and	PSO2	To nurture the students with

2	literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.		commit to professional ethics and responsibilities and norms of the engineering practice.		the critical thinking abilities for better decision making by offering them a socially acceptable solutions to real life problems through computing paradigm.
PO 3	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	PO9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	PSO3	To nurture the students with the comprehensive analytical and design abilities by offering them techno-commercially feasible solutions of real business problems through computing.
PO 4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	PO10	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.		
PO 5	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	PO11	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.		
PO 6	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	PO12	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.		

COs VS POs MAPPING JUSTIFICATION:

S.NO	PO/PSO MAPPED	LEVEL OF MAPPING	JUSTIFICATION
CO1	2/1	1	It introduces foundational principles of software project management, laying the groundwork for effective project planning, execution, and team coordination in entry-level settings.
CO2	3/3	2	It proficiently builds on foundational knowledge, enhancing practical skills in

			managing complex software projects and applying theoretical principles in diverse real-world scenarios.
CO3	3/3	2	It imparts intermediate-level expertise in managing software projects, enabling students to apply practical skills in real-world scenarios and improve project efficiency and success.
CO4	2/3	1	It introduces fundamental principles of software project management, laying the groundwork for essential skills in planning, execution, and team coordination.
CO5	2/1	2	It provides intermediate-level mastery in managing software projects, enhancing skills in planning, execution, and team leadership vital for successful project outcomes.

GAPS IN THE SYLLABUS - TO MEET INDUSTRY/PROFESSION REQUIREMENTS, POs & PSOs:

SNO	DESCRIPTION	PROPOSED ACTIONS
1	Insufficient Focus on Agile Practices: Current syllabus may underrepresent Agile methodologies, which are increasingly prevalent in the industry.	Integrate more comprehensive training on Agile practices, including Scrum, Kanban, and Lean methodologies.
2	Lack of Real-World Case Studies: Theoretical knowledge without application may leave students unprepared for real-world scenarios.	Incorporate case studies and project simulations that mirror current industry challenges and trends.
3	Limited Exposure to Advanced Project Management Tools: Syllabus might not cover the latest project management software and tools extensively.	Update the course to include hands-on experience with contemporary project management tools like JIRA, Trello, and Asana.
4	Neglect of Soft Skills Development: Technical focus overlooks the development of soft skills crucial in project management.	Integrate modules focusing on communication,

		leadership, and teamwork skills
5	Inadequate Training in Risk Management and Quality Assurance: Students may not be adequately prepared to handle risk and ensure quality in software projects.	Strengthen the curriculum with more in-depth coverage of risk management strategies and quality assurance practices in software development.

PROPOSED ACTIONS: TOPICS BEYOND SYLLABUS/ASSIGNMENT/INDUSTRY VISIT/GUEST LECTURER/NPTEL ETC

TOPICS BEYOND SYLLABUS/ADVANCED TOPICS/DESIGN:

1	Emerging Project Management Frameworks
2	Data-Driven Decision Making in Projects
3	Artificial Intelligence and Machine Learning in Project Management
4	Global and Cross-Cultural Project Management
5	Sustainability and Ethical Considerations in Software Projects
6	Advanced Risk Management Techniques
7	Integration of User Experience (UX) Design in Project Management

DELIVERY/INSTRUCTIONAL METHODOLOGIES:

<input type="checkbox"/> CHALK & TALK	<input type="checkbox"/> STUD. ASSIGNMENT	<input type="checkbox"/> WEB RESOURCES	<input type="checkbox"/> NPTEL/OTHERS
<input type="checkbox"/> LCD/SMART BOARDS	<input type="checkbox"/> STUD. SEMINARS	<input type="checkbox"/> ADD-ON COURSES	<input type="checkbox"/> WEBNIARS

ASSESSMENT METHODOLOGIES-DIRECT

<input type="checkbox"/> ASSIGNMENTS	<input type="checkbox"/> STUD. SEMINARS	<input type="checkbox"/> TESTS/MODEL EXAMS	<input type="checkbox"/> UNIV. EXAMINATION
<input type="checkbox"/> STUD. LAB PRACTICES	<input type="checkbox"/> STUD. VIVA	<input type="checkbox"/> MINI/MAJOR PROJECTS	<input type="checkbox"/> CERTIFICATIONS
<input type="checkbox"/> ADD-ON COURSES	<input type="checkbox"/> OTHERS		

ASSESSMENT METHODOLOGIES-INDIRECT

<input type="checkbox"/> ASSESSMENT OF COURSE OUTCOMES (BY FEEDBACK, ONCE)	<input type="checkbox"/> STUDENT FEEDBACK ON FACULTY (TWICE)
<input type="checkbox"/> ASSESSMENT OF MINI/MAJOR PROJECTS BY EXT. EXPERTS	<input type="checkbox"/> OTHERS

INNOVATIONS IN TEACHING/LEARNING/EVALUATION PROCESSES:

1. Implement simulations and virtual project management environments where students can practice managing complex software projects in real-time, allowing them to make decisions and see the outcomes in a controlled setting.
2. Use collaborative tools and platforms that enable students to work on group projects remotely. This approach mirrors the modern, often remote or hybrid, working environments in software project management.



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3. Incorporate structured peer review processes where students assess each other's project plans and management strategies. This encourages collaborative learning and provides diverse perspectives.
4. Partner with software companies to provide real-world case studies. Students can interact with industry professionals, gaining insights into real-world challenges and best practices in software project management.
5. Introduce gamification in the learning process, where students earn badges or points for completing tasks, participating in discussions, or achieving milestones in their project simulations. This can make learning more engaging and fun.

Prepared by

Ms. SHIVANI BANSAL

Approved by

A. Dean & HOD

Additionally, the details to be compiled separately by the Departmental Coordinator for the entire Department.