

AC–
Item No. –

As Per NEP 2020

**Tolani College of
Commerce
(Autonomous)**



Knowledge is Supreme

Title of the Course: Software Project Management

Programme: B.Sc(Information Technology) Semester V

Syllabus for 2 credits

From the academic year- 2024-2025

Name of the Course: Software Project Management

Sr. No.	Heading	Particulars
1	Description of the course :	A software development project is a complex undertaking by two or more persons within the boundaries of time, budget, and staff resources that produces new or enhanced computer code that adds significant business value to a new or existing business process.
2	Vertical:	Skill Enhancement
3	Type:	Theory and Practical
4	Credit:	2credits
5	Hours Allotted:	60 Hours
6	Marks Allotted:	150 Marks Continuous Evaluation: 40 Marks Semester-End: 60 Marks Practical Evaluation 50 Marks
7	Course Objectives:	<ol style="list-style-type: none"> 1. To describe the differences between project management and software project management 2. To use multiple techniques to estimate software tasks, projects and products. 3. To define, implement, analyze and use the metrics required to manage a software project. 4. To define historical data to be captured at project closure
8	Course Outcomes:	<ol style="list-style-type: none"> 1. Learners will be able to Identify the different project contexts and suggest an appropriate management strategy. 2. Learners will practice the role of professional ethics in successful software development 3. Learners will be able to Identify and describe the key phases of project management. 4. Learners will determine an appropriate project management approach through an evaluation of the business context and scope of the project.

9	Module1: Introduction to Software Project Management,Project Evaluation Programme Managementand An Overview of Project Planning(12 hours)
	<ul style="list-style-type: none"> • Introduction, Why is Software Project Management Important? What is a Project? Software Projects versus Other Types of Project, Contract Managementand Technical Project Management, Activities Covered by Software Project Management, Plans, Methods and Methodologies, Some Ways of Categorizing Software Projects, Project Charter, Stakeholders, Setting Objectives, The Business Case, Project Success and Failure, What is Management? Management Control, Project Management LifeCycle, Traditional versus Modern Project Management Practices. • Introduction, Business Case, Project Portfolio Management, Evaluation of IndividualProjects, Cost–benefit Evaluation Techniques, Risk Evaluation, Programme Management, Managing the Allocation of Resources within Programmes, Strategic Programme Management, Creating a Programme, Aids to Programme Management, Some Reservations about Programme Management, Benefits Management. • Introduction to Step Wise Project Planning, Step 0: Select Project, Step 1: Identify Project Scope and Objectives, Step 2: Identify Project Infrastructure, Step 3: Analyse Project Characteristics, Step 4: Identify Project Products and Activities, Step 5: Estimate Effort for Each Activity, Step 6: Identify Activity Risks, Step 7: Allocate Resources, Step 8: Review/Publicize Plan, Steps 9 and 10: Execute Plan/Lower Levels of Planning
	Module2: Selection of an Appropriate Project Approach and Software Effort Estimation(12 hours) <ul style="list-style-type: none"> • Introduction, Build or Buy? Choosing Methodologies and Technologies, Software Processes and Process Models, Choice of Process Models, Structure versus Speed of Delivery, The Waterfall Model, The Spiral Model, Software Prototyping, Other Ways of Categorizing Prototypes, Incremental Delivery, Atern/Dynamic Systems Development Method, Rapid Application Development, Agile Methods, Extreme Programming (XP), Scrum, Lean Software Development, Managing Iterative Processes, Selecting the Most Appropriate Process Model. • Introduction, Where are the Estimates Done? Problems with Over- and Under-Estimates, The Basis for Software Estimating, Software Effort Estimation Techniques, Bottom- up Estimating, The Top-down Approach and Parametric Models, Expert Judgement, Estimating by Analogy, Albrecht Function Point Analysis, Function Points Mark II, COSMIC Full Function Points, COCOMO II: A Parametric Productivity Model, Cost Estimation, Staffing Pattern, Effect of Schedule Compression, Capers Jones Estimating Rules of Thumb.
	Module3:Activity Planning, Risk Management and Resource Allocation(12 hours)
	<ul style="list-style-type: none"> • Introduction, Objectives of Activity Planning, When to Plan, Project Schedules, Projects and Activities, Sequencing and Scheduling Activities, Network Planning Models, Formulating a Network Model, Adding the Time Dimension, The Forward Pass,Backward Pass, Identifying the Critical Path, Activity Float, Shorteningthe Project Duration, Identifying Critical Activities, Activity-on-ArrowNetworks. • Introduction, Risk, Categories of Risk, Risk Management Approaches, A Framework for Dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Evaluating Risks to the Schedule, Boehm’s Top 10 Risks and Counter Measures, Applying the PERT Technique, Monte Carlo Simulation, Critical Chain Concepts. • Introduction, Nature of Resources, Identifying Resource Requirements, Scheduling Resources, Creating Critical Paths, Counting the Cost, Being Specific, Publishing the Resource Schedule, Cost Schedules, Scheduling Sequence.
	Module4:Monitoring and Control, Managing Contracts andManaging People in Software Environments(12 hours)
	<ul style="list-style-type: none"> • Introduction, Creating the Framework, Collecting the Data, Review, Visualizing Progress, Cost

	<p>Monitoring, Earned Value Analysis, Prioritizing Monitoring, Getting the Project Back to Target, Change Control, Software Configuration Management(SCM).</p> <ul style="list-style-type: none"> • Introduction, Types of Contract, Stages in Contract Placement, Typical Terms of a Contract, Contract Management, Acceptance. • Introduction, Understanding Behaviour, Organizational Behaviour: A Background, Selecting the Right Person for the Job, Instruction in the Best Methods, Motivation, The Oldham– Hackman Job Characteristics Model, Stress, Stress Management, Health and Safety, Some Ethical and Professional Concerns.
	<p>Module5: Working in Teams, Software Quality and Project Closeout(12 hours)</p>
	<ul style="list-style-type: none"> • Introduction, becoming a Team, Decision Making, Organization and Team Structures, Coordination Dependencies, Dispersed and Virtual Teams, Communication Genres, Communication Plans, Leadership. • Introduction, The Place of Software Quality in Project Planning, Importance of Software Quality, Defining Software Quality, Software Quality Models, ISO 9126, Product and Process Metrics, Product versus Process Quality Management, Quality Management Systems, Process Capability Models, Techniques to Help Enhance Software Quality, Testing, Software Reliability, Quality Plans. • Introduction, Reasons for Project Closure, Project Closure Process, Performing a Financial Closure, Project Closeout Report.

10	Reference Books: 1) Author/s Bob Hughes, Mike Cotterell, Rajib Mall, Title : Software Project Management, Publisher : TMH , Edition : 6th, Year :2018. 2) Author/s Shailesh Mehta, Title : Project Management and Tools & Technologies – An overview, Publisher : SPD , Edition :1st, Year :2017.	
11	Internal Continuous Assessment:40%	Semester End Examination:60%
12	Practical Evaluation:	50%

13 **Format of Question Paper:**

Scheme of Evaluation Pattern
Table 1A: Scheme of Continuous Evaluation (CE)
Scheme of Evaluation Pattern

Sub-components	Maximum Marks	Conditions for passing
1) Assignment/Project Work/Presentation/Case Study	30	a) A learner must be present for each of the sub-components.
2) Online MCQ Objective Test	10	
Total	40	

Table 1B: Scheme of Semester End Examination (SEE) Evaluation
Question Paper Pattern for Semester End Examination (SEE)
Maximum Marks: 60 **Duration: 2 Hrs.**

Note: All questions are compulsory. Each question has an internal choice.

Question Number	Nature of Questions	Maximum Marks
1)	Attempt any TWO	10
a)		
b)		
c)		
d)		
e)		
2)	Attempt any TWO	10
a)		
b)		
c)		
d)		
e)		
3)	Attempt any TWO	10
a)		
b)		
c)		
d)		
e)		

	4)		Attempt any TWO	10
		a)		
		b)		
		c)		
		d)		
	e)			
	5)		Attempt any TWO	10
		a)		
		b)		
		c)		
		d)		
	e)			
	6)		Attempt any TWO	10
		a)		
		b)		
c)				
d)				
e)				

Course Name: Project Dissertation			
Periods per week (1 Period is 50 minutes)		3	
Credits		2	
		Hours	Marks
Evaluation System	Practical Examination	2½	50
	Internal	--	--

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As Per NEP 2020

**Tolani College of
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Knowledge is Supreme

Title of the Course: Internet of Things

Programme: B.Sc(Information Technology) Semester V

Syllabus for 2 credit

From the academic year- 2024-2025

Name of the Course: Internet of Things

Sr. No.	Heading	Particulars
1	Description of the course :	The Internet of things describes devices with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks. The Internet of things encompasses electronics, communication, and computer science engineering.
2	Vertical:	Skill Enhancement Course
3	Type:	Theory and Practical
4	Credit:	2 credits
5	Hours Allotted:	60 Hours
6	Marks Allotted:	150 Marks Continuous Evaluation: 40Marks Semester-End: 60 Marks Practical Evaluation :50 Marks
7	Course Objectives:	<ol style="list-style-type: none"> 1. Torepresents the trend of future networking, and leads the third wave of the IT industry revolution. 2. To represents the trend of future networking, and leads the third wave of the IT industry revolution.. 3. Learners will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Device
8	Course Outcomes:	<ol style="list-style-type: none"> 1. Able to understand the application areas of IOT · 2. Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks · 3. Able to understand building blocks of Internet of Things and characteristics.

9	Module1:The Internet of Things: An Overview, Design Principles for Connected Devices and Internet Principles(12 hours)
	<ul style="list-style-type: none"> • The Flavour of the Internet of Things, The “Internet” of “Things”, The Technology of the Internet of Things, Enchanted Objects,Who is Making the Internet of Things? • Calm and Ambient Technology, Magic as Metaphor, Privacy, Keeping Secrets, Whose Data Is It Anyway? Web Thinking for Connected Devices, Small Pieces, Loosely Joined, First-Class Citizens on The Internet, Graceful Degradation, Affordances. • Internet Communications: An Overview, IP, TCP, The IP Protocol Suite (TCP/IP), UDP, IP Addresses, DNS, Static IP Address Assignment,Dynamic IP Address Assignment, IPv6, MAC Addresses, TCP and UDP Ports, An Example: HTTP Ports, Other Common Ports, Application Layer Protocols, HTTP,HTTPS Encrypted HTTP, Other Application Layer Protocols.
	Module2: Thinking About Prototyping and Prototyping Embedded Devices(12 hours)
	<ul style="list-style-type: none"> • Sketching, Familiarity, Costs versus Ease of Prototyping, Prototypes and Production, Changing Embedded Platform, Physical Prototypes and Mass Personalisation, climbing into the Cloud, Open Source versus Closed Source, Why Closed? Why Open? Mixing Open and Closed Source, Closed Source for Mass Market Projects, Tapping into the Community. • Electronics, Sensors, Actuators, Scaling Up the Electronics, Embedded Computing Basics, Microcontrollers, System-on-Chips, Choosing Your Platform, Arduino, developing on the Arduino, Some Notes on the Hardware,Openness, Raspberry Pi, Cases and Extension Boards, Developing on the Raspberry Pi, Some Notes on the Hardware, Openness.
	Module3:Prototyping the Physical Design and Prototyping Online Components: (12 hours)
	<ul style="list-style-type: none"> • Preparation, Sketch, Iterate, and Explore, Nondigital Methods, Laser Cutting, Choosing a Laser Cutter, Software, Hinges and Joints, 3D Printing, Types of 3D Printing, Software, CNC Milling, Repurposing/Recycling. • Getting Started with an API, Mashing Up APIs, Scraping, Legalities, writing a New API, Clockodillo, Security, implementing the API, Using Curl to Test, Going Further, Real-Time Reactions, Polling, Comet, Other Protocols, MQ Telemetry Transport, Extensible Messaging and Presence Protocol,Constrained Application Protocol.
	Module4: Techniques for Writing Embedded Code and Business Models: 12 hours)
	<ul style="list-style-type: none"> • Memory Management, Types of Memory, Making the Most of Your RAM, Performance and Battery Life, Libraries, Debugging. • A Short History of Business Models, Space and Time, From Craft to Mass Production, The Long Tail of the Internet, Learning from History, The Business Model Canvas, Who Is the Business Model For? Models, Make Thing, Sell Thing, Subscriptions, Customisation, be a Key Resource, Provide Infrastructure: Sensor Networks, take a Percentage, Funding an Internet of Things Startup,Hobby Projects and Open Source, Venture Capital, Government Funding, Crowdfunding, Lean Startups.Creating a Project with Django.
	Module5: Moving to Manufacture and Ethics(12 hours)
	<ul style="list-style-type: none"> • What Are You Producing? Designing Kits, Designing Printed circuit boards, Software Choices, The Design Process, Manufacturing Printed Circuit Boards, Etching Boards, Milling Boards. Assembly, Testing, Mass-Producing the Case and Other Fixtures, Certification, Costs, Scaling Up Software, Deployment, Correctness and Maintainability, Security, Performance, User Community. • Characterizing the Internet of Things, Privacy, Control, Disrupting Control, Crowdsourcing, Environment, Physical Thing, Electronics, Internet Service, Solutions, The Internet of Things as Partof the Solution, Cautious Optimism, The Open Internet of Things Definition.

10	Reference Books: 1) Author/s: Cuno Pfister , Title : Getting Started with the Internet of Things, Publisher : O'Reilly , Edition : 6th, Year : 2018. 2) Author/s: Raj Kamal, Title: Internet of Things – Architecture and Design, Publisher : McGraw Hill , Edition : 1 st , Year : 2017.	
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11	Internal Continuous Assessment:40%	Semester End Examination:60%
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12	Practical Evaluation:	50 %
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13 **Format of Question Paper:**

Scheme of Evaluation Pattern
Table 1A: Scheme of Continuous Evaluation (CE/Practical)
Scheme of Evaluation Pattern

Sub-components	Maximum Marks	Conditions for passing
3) Assignment/Project Work/Presentation/Case Study	30	A learner must be present for each of the sub-components.
4) Online MCQ Objective Test	10	
Total	40	

Table 1B: Scheme of Semester End Examination (SEE) Evaluation
Question Paper Pattern for Semester End Examination (SEE)
Maximum Marks: 60 **Duration: 2 Hrs.**

Note: All questions are compulsory. Each question has an internal choice.

Question Number	Nature of Questions	Maximum Marks
1)	Attempt any TWO	10
	a)	
	b)	
	c)	
	d)	
	e)	
2)	Attempt any TWO	10
	a)	
	b)	

		c)		
		d)		
		e)		
	3)	Attempt any TWO		10
		f)		
		g)		
		h)		
		i)		
		j)		
	4)	Attempt any TWO		10
		a)		
		b)		
		c)		
		d)		
		e)		
	5)	Attempt any TWO		10
		a)		
		b)		
		c)		
		d)		
		e)		
	6)	Attempt any TWO		10
		a)		
		b)		
		c)		
		d)		
		e)		

Course Name: Internet of Things Practical			
Periods per week (1 Period is 50 minutes)		3	
Credits		2	
		Hours	Marks
Evaluation System	Practical Examination	2½	50
	Internal	--	--

Practical No	Details
1	Starting Raspbian OS, Familiarising with Raspberry Pi Components and interface, Connecting to ethernet, Monitor, USB.
2	Displaying different LED patterns with Raspberry Pi.
3	Displaying Time over 4-Digit 7-Segment Display using Raspberry Pi
4	Raspberry Pi Based Oscilloscope
5	Controlling Raspberry Pi with WhatsApp.
6	Setting up Wireless Access Point using Raspberry Pi
7	Fingerprint Sensor interfacing with Raspberry Pi
8	Raspberry Pi GPS Module Interfacing
9	IoT based Web Controlled Home Automation using Raspberry Pi
10	Visitor Monitoring with Raspberry Pi and Pi Camera
11	Interfacing Raspberry Pi with RFID.
12	Building Google Assistant with Raspberry Pi.
13	Installing Windows 10 IoT Core on Raspberry Pi

1	Q.1	20
2	Q.2	20
3	Viva	5
4	Journal	5
5	Total	50

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As Per NEP 2020

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Knowledge is Supreme

Title of the Course: Advanced Web Programming

Programme :Bachelor of Science (Information Technology)Semester V

Syllabus for 2 credits

From the academic year-2024-2025

Name of the Course: Advanced Web Programming

Sr. No.	Heading	Particulars
1	Description the course :	This course covers topics ranging from programming a basic, web-based shopping cart to integrating the application to a back-end database.
2	Vertical:	Skill Enhancement Course
3	Type:	Theory and Practical
4	Credit:	2 credits
5	Hours Allotted:	60 Hours
6	Marks Allotted:	Total 150 Marks Continuous Evaluation 40 Marks Semester End Examination 60 Marks Practical Evolution 50 Marks
7	Course Objectives:	<ol style="list-style-type: none">1. Create and Console Application with basics code.2. Create the Application using different types of statements and loops.3. Know about namespaces and assemblies and how to create the same.4. Create console application using delegates and methods.
8	Course Outcomes:	<ol style="list-style-type: none">1. Able to gain the knowledge for designing and developing web applications.2. Apply PHP7 to improve accessibility of a web document.3. Develop a static, interactive and well formed webpage using JavaScript, CSS3. and HTML5.

9	<p>Modules:-</p> <p>Module 1: Introducing .NET, The C# Language and Types, Objects, and Namespaces(12 hours)</p> <ul style="list-style-type: none"> • The .NET Framework, C#, VB, and the .NET Languages, The Common Language Runtime, The .NET Class Library. • C# Language Basics, Variables and Data Types, Variable Operations, Object-Based Manipulation, Conditional Logic, Loops, Methods. • The Basics About Classes, Building a Basic Class, Value Types and Reference Types, Understanding Namespaces and Assemblies, Advanced Class Programming. <p>Module2: Web Form Fundamentals and Form Controls: (12 hours)</p> <ul style="list-style-type: none"> • Writing Code, Using the Code-Behind Class, Adding Event Handlers, Understanding the Anatomy of an ASP.NET Application, Introducing Server Controls, Using the Page Class, Using Application Events, Configuring an ASP.NET Application. • Stepping Up to Web Controls, Web Control Classes, List Controls, Table Controls, Web Control Events and AutoPostBack, Validation, Understanding Validation, Using the Validation Controls, Rich Controls, The Calendar, The AdRotator, Pages with Multiple Views, User Controls and Graphics, User Controls, Dynamic Graphics, The Chart Control, Website Navigation: Site Maps, URL Mapping and Routing, The SiteMapPath Control, The TreeView Control, The Menu Control.
	<p>Module3: Error Handling, Logging, and Tracing , State Management and Styles, Themes, and Master Pages(12 hours)</p> <ul style="list-style-type: none"> • Avoiding Common Errors, Understanding Exception Handling, Handling Exceptions, Throwing Your Own Exceptions, Using Page Tracing • Understanding the Problem of State, Using View State, Transferring Information Between Pages, Using Cookies, Managing Session State, Configuring Session State, Using Application State, Comparing State Management Options • Styles, Themes, Master Page Basics, Advanced Master Pages,
	<p>Module4: ADO.NET Fundamentals ,Data Binding and The Data Controls(12 hours)</p> <ul style="list-style-type: none"> • Understanding Databases, Configuring Your Database, Understanding SQL Basics, Understanding the Data Provider Model, Using Direct Data Access, Using Disconnected Data Access. • Introducing Data Binding, Using Single-Value Data Binding, Using Repeated-Value Data Binding, Working with Data Source Controls, • The Grid View, Formatting the Grid View, selecting a Grid View Row, Editing with the Grid View, Sorting and Paging the Grid View, Using Grid View Templates, The Details View and Form View
	<p>Module5: XML, Security Fundamentals and ASP.NET AJAX(12 hours)</p> <ul style="list-style-type: none"> • XML Explained, The XML Classes, XML Validation, XML Display and Transforms. • Understanding Security Requirements, Authentication and Authorization, Forms Authentication, Windows Authentication. • Understanding Ajax, Using Partial Refreshes, Using Progress Notification, Implementing Timed Refreshes, Working with the ASP.NET AJAX Control Toolkit.
10	

Reference Books:

- 1) **Author/s:** Anne Bohem and Joel Murach **Title :** C# 2015, **Publisher :** Murach , **Edition :**Third, **Year :**2016.
- 2) **Author/s:** Mary Delamater and Anne Bohem **Title**Murach's ASP.NET 4.6Web Programming in C#2015, **Publisher :** SPD , **Edition :**Sixth, **Year :**2016.

11	Internal Continuous Assessment: 40%	Semester End Examination: 60%
12	Practical Evaluation:	50%

13	<p>Format of Question Paper:</p> <p style="text-align: center;">Scheme of Evaluation Pattern Table 1A: Scheme of Continuous Evaluation (CE/Practical) Scheme of Evaluation Pattern</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Sub-components</th> <th>Maximum Marks</th> <th>Conditions for passing</th> </tr> </thead> <tbody> <tr> <td>5) Assignment/Project Work/Presentation/Case Study</td> <td style="text-align: center;">30</td> <td rowspan="3" style="text-align: center;">A learner must be present for each of the sub-components.</td> </tr> <tr> <td>6) Online MCQ Objective Test</td> <td style="text-align: center;">10</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;">40</td> </tr> </tbody> </table> <p style="text-align: center;">Table 1B: Scheme of Semester End Examination (SEE) Evaluation Question Paper Pattern for Semester End Examination (SEE) Maximum Marks: 30 Duration: 1 Hrs. Note: All questions are compulsory. Each question has an internal choice.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Question Number</th> <th>Nature of Questions</th> <th>Maximum Marks</th> </tr> </thead> <tbody> <tr> <td>3)</td> <td>Attempt any TWO</td> <td rowspan="6" style="text-align: center;">10</td> </tr> <tr> <td>a)</td> <td></td> </tr> <tr> <td>b)</td> <td></td> </tr> <tr> <td>c)</td> <td></td> </tr> <tr> <td>d)</td> <td></td> </tr> <tr> <td>e)</td> <td></td> </tr> <tr> <td>4)</td> <td>Attempt any TWO</td> <td rowspan="6" style="text-align: center;">10</td> </tr> <tr> <td>a)</td> <td></td> </tr> <tr> <td>b)</td> <td></td> </tr> <tr> <td>c)</td> <td></td> </tr> <tr> <td>d)</td> <td></td> </tr> <tr> <td>e)</td> <td></td> </tr> <tr> <td>3)</td> <td>Attempt any TWO</td> <td rowspan="6" style="text-align: center;">10</td> </tr> <tr> <td>k)</td> <td></td> </tr> <tr> <td>l)</td> <td></td> </tr> <tr> <td>m)</td> <td></td> </tr> <tr> <td>n)</td> <td></td> </tr> <tr> <td>o)</td> <td></td> </tr> <tr> <td>4)</td> <td>Attempt any TWO</td> <td rowspan="4" style="text-align: center;">10</td> </tr> <tr> <td>a)</td> <td></td> </tr> <tr> <td>b)</td> <td></td> </tr> <tr> <td>c)</td> <td></td> </tr> </tbody> </table>		Sub-components	Maximum Marks	Conditions for passing	5) Assignment/Project Work/Presentation/Case Study	30	A learner must be present for each of the sub-components.	6) Online MCQ Objective Test	10	Total	40	Question Number	Nature of Questions	Maximum Marks	3)	Attempt any TWO	10	a)		b)		c)		d)		e)		4)	Attempt any TWO	10	a)		b)		c)		d)		e)		3)	Attempt any TWO	10	k)		l)		m)		n)		o)		4)	Attempt any TWO	10	a)		b)		c)	
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	6)		Attempt any TWO		10
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		e)			

Course Name: Advanced Web Programming Practical			
Periods per week (1 Period is 50 minutes)		3	
Credits		2	
		Hours	Marks
Evaluation System	Practical Examination	2½	50
	Internal	--	--

List of Practical	
1.	Working with basic C# and ASP .NET
a.	Create an application that obtains four int values from the user and displays the product.
b.	Create an application to demonstrate string operations.
c.	Create an application that receives the (Student Id, Student Name, Course Name, Date of Birth) information from a set of students. The application should also display the information of all the students once the data entered.
d.	Create an application to demonstrate following operations i. Generate Fibonacci series. ii. Test for prime numbers. iii. Test for vowels. iv. Use of for each loop with arrays v. Reverse a number and find sum of digits of a number.
2.	Working with Object Oriented C# and ASP .NET
a.	Create simple application to perform following operations i. Finding factorial Value ii. Money Conversion iii. Quadratic Equation iv. Temperature Conversion

5.	Working with Navigation, Beautification and Master page.
a.	Create Web Form to demonstrate use of Website Navigation controls and Site Map.
b.	Create a web application to demonstrate use of Master Page with applying Styles and Themes for page beautification.
c.	Create a web application to demonstrate various states of ASP.NET Pages.
6.	Working with Database
a.	Create a web application bind data in a multiline textbox by querying in another textbox.
b.	Create a web application to display records by using database.
c.	Demonstrate the use of Datalist link control.
7.	Working with Database
a.	Create a web application to display Databinding using dropdownlist control.
b.	Create a web application for to display the phone no of an author using database.
c.	Create a web application for inserting and deleting record from a database. (Using Execute-Non Query).
8.	Working with data controls
a.	Create a web application to demonstrate various uses and properties of SqlDataSource.
b.	Create a web application to demonstrate data binding using DetailsView and FormView Control.
c.	Create a web application to display Using Disconnected Data Access and Databinding using GridView.
9.	Working with GridView control
a.	Create a web application to demonstrate use of GridView control template and GridView hyperlink.
b.	Create a web application to demonstrate use of GridView button column and GridView events.
c.	Create a web application to demonstrate GridView paging and Creating own table format using GridView.
10.	Working with AJAX and XML
a.	Create a web application to demonstrate reading and writing operation with XML.
b.	Create a web application to demonstrate Form Security and Windows Security with proper Authentication and Authorization properties.
c.	Create a web application to demonstrate use of various Ajax controls.
11.	Programs to create and use DLL

1	Q.1	20
2	Q.2	20
3	Viva	5
4	Journal	5
5	Total	50

AC–
Item No. –

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Knowledge is Supreme

Title of the Course: Artificial Intelligence

Programme :Bachelor of Science (Information Technology)Semester V

Syllabus for 2 credits

From the academic year-2024-2025

Name of the Course: Artificial Intelligence

Sr. No.	Heading	Particulars
1	Description the course :	The goals of artificial intelligence include computer-enhanced learning, reasoning, and perception. AI is being used today across different industries from finance to healthcare.
2	Vertical:	Skill Enhancement Course
3	Type:	Theory and Practical
4	Credit:	2 credits
5	Hours Allotted:	60 Hours
6	Marks Allotted:	Total 150 Marks Continuous Evaluation 40 Marks Semester End Examination 60 Marks Practical Evaluation 50 Marks
7	Course Objectives:	<ol style="list-style-type: none">1. Apply selected basic AI techniques2. Artificial intelligence (AI) refers to the simulation or approximation of human intelligence in machines.3. judge applicability of more advanced techniques.4. Participate in the design of systems that act intelligently and learn from experience.
8	Course Outcomes:	<ol style="list-style-type: none">1.AI system accepts data input in the form of speech, text, image, etc.2. The system then processes data by applying various rules and algorithms, interpreting, predicting, and acting on the input data.3.etermine the framework in which AI bots may function, including interactions with users and environments.4.Design and implement cognitive automation for different industries.

9	<p>Modules:-</p> <p>Module 1: Introduction and Intelligent Agents (12 hours)</p> <ul style="list-style-type: none"> • What is Artificial Intelligence? Foundations of AI, history, the state of art AI today. • agents and environment, good behavior, nature of environment, the structure of agents. <p>Module2: Solving Problems by Searching and Beyond Classical Search (12 hours)</p> <ul style="list-style-type: none"> • Problem solving agents, examples problems, searching for solutions, uninformed search, informed search strategies, heuristic functions. • local search algorithms, searching with non-deterministic action, searching with partial observations, online search agents and unknown environments.
	<p>Module3: Adversarial Search and Logical Agents (12 hours)</p> <ul style="list-style-type: none"> • Games, optimal decisions in games, alpha-beta pruning, stochastic games, partially observable games, state-of-the-art game programs. • Knowledge base agents, The Wumpus world, logic, propositional logic, propositional theorem proving, effective propositional model checking, agents based on propositional logic.
	<p>Module4: First Order Logic and Inference in First Order Logic(12 hours)</p> <ul style="list-style-type: none"> • Syntax and semantics, using First Order Logic, Knowledge engineering in First Order Logic. • propositional vs. First Order, unification and lifting, forward and backward chaining, resolution.
	<p>Module5: Planning and Knowledge Representation()(12 hours)</p> <ul style="list-style-type: none"> • Definition of Classical Planning, Algorithms for planning as state space search, planning graphs, other classical planning approaches, analysis of planning approaches, Time, Schedules and resources, hierarchical planning, Planning and Acting in Nondeterministic Domains, multiagent planning, Categories and Objects, events, mental • events and objects, reasoning systems for categories, reasoning with default information, Internet shopping world
10	<p>Reference Books:</p> <ol style="list-style-type: none"> 1) Author/s: Rahul Deva Title :Artificial Intelligence: A Rational Approach, Publisher :Shroff publishers , Edition :1st, Year:2018. 2) Author/s:Deepak Khemani Title A First Course in Artificial Intelligence, Publisher :TMH , Edition :First, Year:2017.

11	Internal Continuous Assessment: 40%	Semester End Examination: 60%
12	Practical Evaluation :	50%

13 **Format of Question Paper:**

Scheme of Evaluation Pattern
Table 1A: Scheme of Continuous Evaluation (CE/Practical)
Scheme of Evaluation Pattern

Sub-components	Maximum Marks	Conditions for passing
7) Assignment/Project Work/Presentation/Case Study	30	A learner must be present for each of the sub-components.
8) Online MCQ Objective Test	10	
Total	40	

Table 1B: Scheme of Semester End Examination (SEE) Evaluation
Question Paper Pattern for Semester End Examination (SEE)

Maximum Marks: 30

Duration: 1 Hrs.

Note: All questions are compulsory. Each question has an internal choice.

Question Number	Nature of Questions	Maximum Marks
5)	Attempt any TWO	10
a)		
b)		
c)		
d)		
e)		
6)	Attempt any TWO	10
a)		
b)		
c)		
d)		
e)		
3)	Attempt any TWO	10
p)		
q)		
r)		
s)		
t)		
4)	Attempt any TWO	10
a)		
b)		
c)		
d)		
e)		

5)		Attempt any TWO	10
	a)		
	b)		
	c)		
	d)		
	e)		
6)		Attempt any TWO	10
	a)		
	b)		
	c)		
	d)		
	e)		

Course Name: Artificial Intelligence Practical

Periods per week (1 Period is 50 minutes)	3		
Credits	2		
	Hours	Marks	
Evaluation System	Practical Examination	2½	50
	Internal	--	--

Practical No	Details	
1	a	Write a program to implement depth first search algorithm.
	b	Write a program to implement breadth first search algorithm.
2	a	Write a program to simulate 4-Queen / N-Queen problem.
	b	Write a program to solve tower of Hanoi problem.
3	a	Write a program to implement alpha beta search.
	b	Write a program for Hill climbing problem.
4	a	Write a program to implement A* algorithm.
	b	Write a program to implement AO* algorithm.
5	a	Write a program to solve water jug problem.
	b	Design the simulation of tic – tac – toe game using min-max algorithm.
6	a	Write a program to solve Missionaries and Cannibals problem.
	b	Design an application to simulate number puzzle problem.
7	a	Write a program to shuffle Deck of cards.
	b	Solve traveling salesman problem using artificial intelligence technique.
8	a	Solve the block of World problem.
	b	Solve constraint satisfaction problem
9	a	Derive the expressions based on Associative law
	b	Derive the expressions based on Distributive law
10	a	Write a program to derive the predicate. (for e.g.: Sachin is batsman , batsman is cricketer) -> Sachin is Cricketer.

		b	<p>Write a program which contains three predicates: male, female, parent. Make rules for following family relations: father, mother, grandfather, grandmother, brother, sister, uncle, aunt, nephew and niece, cousin.</p> <p>Question:</p> <p>i. Draw Family Tree.</p> <p>ii. Define: Clauses, Facts, Predicates and Rules with conjunction and disjunction</p>
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1	Q.1	20
2	Q.2	20
3	Viva	5
4	Journal	5
5	Total	50

AC–
Item No. –

As Per NEP 2020

**Tolani College of
Commerce
(Autonomous)**



Knowledge is Supreme

Title of the Course: Enterprise Java

Programme :Bachelor of Science (Information Technology)Semester V

Syllabus for 2 credits

From the academic year-2024-2025

Name of the Course: Enterprise Java

Sr. No.	Heading	Particulars
1	Description the course :	Enterprise Edition (Java EE) is the standard in community-driven enterprise software. Java EE is developed using the Java Community Process, with contributions from industry experts, commercial and open source organizations, Java User Groups, and countless individuals.
2	Vertical:	Skill Enhancement Course
3	Type:	Theory and Practical
4	Credit:	2 credits
5	Hours Allotted:	60 Hours
6	Marks Allotted:	Total 150 Marks Continuous Evaluation 40 Marks Semester End Examination 60 Marks Practical Evaluation 50 Marks
7	Course Objectives:	<ol style="list-style-type: none">1) To learn why Java is useful for the design of desktop and web applications.2) To learn how to implement object-oriented designs with Java.3) To identify Java language components and how they work together in applications.4) To design and program stand-alone Java applications.
8	Course Out comes:	<ol style="list-style-type: none">1) Learners will understand the concepts related to Java Technology2) Learners will explore and understand use of Java Server Programming3) Learners will create dynamic web pages, using Servlets and JSP4) Learners learn to access database through Java programs, using Java Database Connectivity (JDBC)

9	Modules:-
	Module 1: Understanding Java EE, Java EE Architecture, Server and Containers, Introduction to Java Servlets, Servlet API and Lifecycle, Working with Servlets, Working with Databases: (12 hours)
	<ul style="list-style-type: none"> • What is an Enterprise Application? What is java enterprise edition? Java EE Technologies, Java EE evolution, Glassfish server • Types of System Architecture, Java EE Server, Java EE Containers. • The Need for Dynamic Content, Java Servlet Technology, Why Servlets? What can Servlets do? • Java Servlet API, The Servlet Skeleton, The Servlet Life Cycle, A Simple Welcome Servlet • Getting Started, Using Annotations Instead of Deployment Descriptor. • What Is JDBC? JDBC Architecture ,Accessing Database, The Servlet GUI and Database Example.
	Module2: Request Dispatcher, COOKIES, SESSION,Working with Files, Working with Non-Blocking I/O (12 hours)
	<ul style="list-style-type: none"> • RequestDispatcher Interface, Methods of RequestDispatcher, RequestDispatcher Application. • Kinds of Cookies, Where Cookies Are Used? Creating Cookies Using Servlet, Dynamically Changing the Colors of A Page • What Are Sessions? Lifecycle of Http Session, Session Tracking With Servlet API, A Servlet Session Example • Uploading Files, Creating an Upload File Application, Downloading Files, Creating a Download File Application. • Creating a Non-Blocking Read Application, Creating The Web Application, Creating Java Class, Creating Servlets, Retrieving The File, Creating index.jsp
	Module3: Introduction To Java Server Pages, Getting Started With Java Server Pages, Action Elements Implicit Objects, Scope and El Expressions and Java Server Pages Standard Tag Libraries(12 hours) <ul style="list-style-type: none"> • Why use Java Server Pages? Disadvantages Of JSP, JSP v\s Servlets, Life Cycle of a JSP Page, How does a JSP function? How does JSP execute? About Java Server Pages • Comments, JSP Document, JSP Elements, JSP GUI Example. • Including other Files, Forwarding JSP Page to Another Page, Passing Parameters for other Actions, Loading a Javabean. • Implicit Objects, Character Quoting Conventions, Unified Expression Language [UnifiedEl], Expression Language. • What is wrong in using JSP Scriptlet Tags? How JSTL Fixes JSP Scriptlet's Shortcomings?Disadvantages Of JSTL, Tag Libraries.
	Module4: Introduction To Enterprise Javabeans, Working with Session Beans, Working with Message Driven Beans, Interceptors and Java Naming and Directory Interface(12 hours) <ul style="list-style-type: none"> • Enterprise Bean Architecture, Benefits of Enterprise Bean, Types of Enterprise Bean, Accessing Enterprise Beans, Enterprise Bean Application, Packaging Enterprise Beans • : When to use Session Beans? Types of Session Beans, Remote and Local Interfaces, Accessing Interfaces, Lifecycle of Enterprise Beans, Packaging Enterprise Beans, Example of Stateful Session Bean, Example of Stateless Session Bean, Example of Singleton Session Beans. • Lifecycle of a Message Driven Bean, Uses of Message Driven Beans, The Message Driven Beans Example. • Request and Interceptor, Defining An Interceptor, AroundInvoke Method, Applying Interceptor, Adding An Interceptor To An Enterprise Bean, Build and Run the Web Application.

	<ul style="list-style-type: none"> • What is Naming Service? What is Directory Service? What is Java Naming and Directory interface? Basic Lookup, JNDI Namespace in Java EE, Resources and JNDI, Datasource Resource Definition in Java EE
	<p>Module5: Persistence,Object/Relational Mapping And JPA, Introduction to Java Persistence API, Writing JPA Application, Introduction to Hibernate and Writing Hibernate Application(12 hours)</p> <ul style="list-style-type: none"> • What is Persistence? Persistence in Java, Current Persistence Standards in Java, Why another Persistence Standards? Object/Relational Mapping, • The Java Persistence API, JPA, ORM, Database and the Application, Architecture of JPA, How JPA Works? JPA Specifications. • Application Requirement Specifications, Software Requirements, The Application Development Approach, Creating Database and Tables in Mysql, creating a Web Application, Adding the Required Library Files, creating a Javabeen Class, Creating Persistence Unit [Persistence.Xml], Creating JSPS, The JPA Application Structure, Running the JPA Application. • What is Hibernate? Why Hibernate? Hibernate, Database and The Application, Components of Hibernate, Architecture of Hibernate, How Hibernate Works? • Application Requirement Specifications, Software Requirements, The Application Development Approach, Creating Database and Tables in Mysql, creating a Web Application, Adding the Required Library Files, creating a Javabeen Class, Creating Hibernate Configuration File, Adding a Mapping Class, Creating JSPS, Running The Hibernate Application.
10	<p>Reference Books:</p> <ol style="list-style-type: none"> 1) Author/s:Elder MoraesTitle :Java EE 8 Cookbook:Build reliable applicationswith the most robust andmature technology forenterprise development, Publisher :Packt , Edition :First, Year:2018. 2) Author/s:Sharanam Shah, Vaishali ShahTitleJava EE 7 For Beginners, Publisher : SPD , Edition :First, Year:2017.

11	Internal Continuous Assessment: 40%	Semester End Examination: 60%
12	practical Evaluation :	50%

13	<p>Format of Question Paper:</p> <p style="text-align: center;">Scheme of Evaluation Pattern Table 1A: Scheme of Continuous Evaluation (CE/Practical) Scheme of Evaluation Pattern</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Sub-components</th> <th>Maximum Marks</th> <th>Conditions for passing</th> </tr> </thead> <tbody> <tr> <td>9) Assignment/Project Work/Presentation/Case Study</td> <td style="text-align: center;">30</td> <td rowspan="3" style="vertical-align: top;">A learner must be present for each of the sub-components.</td> </tr> <tr> <td>10) Online MCQ Objective Test</td> <td style="text-align: center;">10</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;">40</td> </tr> </tbody> </table> <p style="text-align: center;">Table 1B: Scheme of Semester End Examination (SEE) Evaluation Question Paper Pattern for Semester End Examination (SEE) Maximum Marks: 30 Duration: 1 Hrs.</p> <p>Note: All questions are compulsory. Each question has an internal choice.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Question Number</th> <th>Nature of Questions</th> <th>Maximum Marks</th> </tr> </thead> <tbody> <tr> <td>7)</td> <td>Attempt any TWO</td> <td rowspan="6" style="text-align: center;">10</td> </tr> <tr> <td></td> <td>a)</td> </tr> <tr> <td></td> <td>b)</td> </tr> <tr> <td></td> <td>c)</td> </tr> <tr> <td></td> <td>d)</td> </tr> <tr> <td></td> <td>e)</td> </tr> <tr> <td>8)</td> <td>Attempt any TWO</td> <td rowspan="6" style="text-align: center;">10</td> </tr> <tr> <td></td> <td>a)</td> </tr> <tr> <td></td> <td>b)</td> </tr> <tr> <td></td> <td>c)</td> </tr> <tr> <td></td> <td>d)</td> </tr> <tr> <td></td> <td>e)</td> </tr> <tr> <td>3)</td> <td>Attempt any TWO</td> <td rowspan="6" style="text-align: center;">10</td> </tr> <tr> <td></td> <td>u)</td> </tr> <tr> <td></td> <td>v)</td> </tr> <tr> <td></td> <td>w)</td> </tr> <tr> <td></td> <td>x)</td> </tr> <tr> <td></td> <td>y)</td> </tr> <tr> <td>4)</td> <td>Attempt any TWO</td> <td rowspan="4" style="text-align: center;">10</td> </tr> <tr> <td></td> <td>a)</td> </tr> <tr> <td></td> <td>b)</td> </tr> <tr> <td></td> <td>c)</td> </tr> </tbody> </table>		Sub-components	Maximum Marks	Conditions for passing	9) Assignment/Project Work/Presentation/Case Study	30	A learner must be present for each of the sub-components.	10) Online MCQ Objective Test	10	Total	40	Question Number	Nature of Questions	Maximum Marks	7)	Attempt any TWO	10		a)		b)		c)		d)		e)	8)	Attempt any TWO	10		a)		b)		c)		d)		e)	3)	Attempt any TWO	10		u)		v)		w)		x)		y)	4)	Attempt any TWO	10		a)		b)		c)
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		b)			
		c)			
		d)			
		e)			

Course Name: Enterprise Java Practical			
Periods per week (1 Period is 50 minutes)		3	
Credits		2	
		Hours	Marks
Evaluation System	Practical Examination	2½	50
	Internal	--	--

List of Practical	
1	Implement the following Simple Servlet applications.
.	
a	Create a simple calculator application using servlet.
.	
b	Create a servlet for a login page. If the username and password are correct then it says message "Hello <username>" else a message "login failed"
.	
c	Create a registration servlet in Java using JDBC. Accept the details such as Username, Password, Email, and Country from the user using HTML Form and store the registration details in the database.
.	
2	Implement the following Servlet applications with Cookies and Sessions.
.	
a	Using Request Dispatcher Interface create a Servlet which will validate the password entered by the user, if the user has entered "Servlet" as password, then he will be forwarded to Welcome Servlet else the user will stay on the index.html page and an error message will be displayed.
.	
b	Create a servlet that uses Cookies to store the number of times a user has visited servlet.
.	
c	Create a servlet demonstrating the use of session creation and destruction. Also check whether the user has visited this page first time or has visited earlier also using sessions.
.	

3 .	Implement the Servlet IO and File applications.
a .	Create a Servlet application to upload and download a file.
b .	Develop Simple Servlet Question Answer Application using Database.
c .	Create simple Servlet application to demonstrate Non-Blocking Read Operation.
4 .	Implement the following JSP applications.
a .	Develop a simple JSP application to display values obtained from the use of intrinsic objects of various types.
b .	Develop a simple JSP application to pass values from one page to another with validations. (Name-txt, age-txt, hobbies-checkbox, email-txt, gender-radio button).
c .	Create a registration and login JSP application to register and authenticate the user based on username and password using JDBC.
5 .	Implement the following JSP JSTL and EL Applications.
a .	Create an html page with fields, eno, name, age, desg, salary. Now on submit this data to a JSP page which will update the employee table of database with matching eno.
b .	Create a JSP page to demonstrate the use of Expression language.
c .	Create a JSP application to demonstrate the use of JSTL.

6	Implement the following EJB Applications.
.	
a	Create a Currency Converter application using EJB.
.	
b	Develop a Simple Room Reservation System Application Using EJB.
.	
c	Develop simple shopping cart application using EJB [Stateful Session Bean].
.	
7	Implement the following EJB applications with different types of Beans.
.	
a	Develop simple EJB application to demonstrate Servlet Hit count using Singleton Session Beans.
.	
b	Develop simple visitor Statistics application using Message Driven Bean [Stateless Session Bean].
.	
c	Develop simple Marks Entry Application to demonstrate accessing Database using EJB.
.	
8	Implement the following JPA applications.
.	
a	Develop a simple Inventory Application Using JPA.
.	
b	Develop a Guestbook Application Using JPA.
.	
c	Create simple JPA application to store and retrieve Book details.
.	
9	Implement the following JPA applications with ORM and Hibernate.
.	
a	Develop a JPA Application to demonstrate use of ORM associations.
.	
b	Develop a Hibernate application to store Feedback of Website Visitor in MySQL Database.
.	
c	Develop a Hibernate application to store and retrieve employee details in MySQL Database.
.	
10	Implement the following Hibernate applications.
.	
a	Develop an application to demonstrate Hibernate One- To -One Mapping Using Annotation.
.	
b	Develop Hibernate application to enter and retrieve course details with ORM Mapping.
.	
c	Develop a five page web application site using any two or three Java EE Technologies.
.	

1	Q.1	20
2	Q.2	20
3	Viva	5
4	Journal	5
5	Total	50

