Re-Accredited 'B++' 2.86 CGPA by NAAC
VEER NARMAD SOUTH GUJARAT UNIVERSITY
University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
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ક્રમાંક : એસ/પરિપત્ર/સિલેબસ/૫૦૩૬/૨૦૨૪
તા.૦૭/૦૩/૨૦૨૪

પ્રતિ,
વડાશ્રી,
જે.પી.દાવર ઈન્સ્ટીટયૂટ ઓફ ઈન્ફોર્મેશન
સાયન્સ એન્ડ ટેકનોલોજી,
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી,
સુરત.

<u>વિષય :–</u> એમ. .એસસી. (આઈ.ટી.) સેમે.–૭ અને ૮ ના અભ્યાસક્રમ બાબત.

મહાશય,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૪–૨૫ થી અમલમાં આવનાર M.Sc. (IT) Sem. 7 & 8નો અભ્યાસ સમિતિ દ્વારા નિયુક્ત પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ અભ્યાસક્રમ સંદર્ભે ઈન્ફોર્મેશન ટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા.૧૨/૦૨/૨૦૨૪ની સભાના ઠરાવ ક્રમાંક :૩ અન્વયે નીચે મુજબ કરેલ ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખાવતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૦૧/૦૩/૨૦૨૪ની સભાનાં ઠરાવ ક્રમાંકઃ ૦૫ થી મંજુર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

<u>ઈન્ફોર્મેશન ટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા.૧૨/૦૨/૨૦૨૪ ની સભાના ઠરાવ ક્રમાંકઃ૩</u>

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૪–૨૫ થી અમલમાં આવનાર એમ.એસસી.(આઈ.ટી) સેમેસ્ટર– ૭ અને ૮ નો પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ અભ્યાસક્રમ સર્વાનુમતે મંજૂર કરી કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૦૧/૦૩/૨૦૨૪ની સભાનાં ઠરાવ ક્રમાંકઃ ૦૫

:: આથી ઠરાવવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૪–૨૫ થી અમલમાં આવનાર M.Sc.(IT) Sem. 7 & 8 નો અભ્યાસ સમિતિ દ્વારા નિયુક્ત પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ અભ્યાસક્રમ સંદર્ભે ઈન્ફોર્મેશન ટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા.૧૨/૦૨/૨૦૨૪ની સભાના ઠરાવ ક્રમાંક :૩ અન્વયે કરેલ ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ સ્વીકારી મંજૂર કરવામાં આવે છે.

બિડાણઃ ઉપર મુજબ

કુલસચિવ

પ્રતિ,
૧) અધ્યક્ષશ્રી, કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખા.
૨) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

...તરફ જાણ તેમજ અમલ સારૂ.

કોષ્ટક: 5
ક્રમાંક: 4

અકેડમિક કાઉન્સિલ તા. 01/03/2024
બાબત.....05.....બિડાણ/પરિશિષ્ટ.....4.....

M.Sc. (I.T.) 7th Semester

Course : 701 : Application Development using Full Stack

Course Code	701
Course Title	Application Development using Full Stack
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Effective From	June 2024
Purpose of Course	This course is designed to augment students' programming skills with the latest technologies.
Course Objective	To provide understanding of the prototypal inheritance, Node.js, express, mongoDB, React.js and making students able to develop programs Full stack architecture.
Course Outcomes	CO1 : Students will be able to learn about MVC applications using NODE.JS, Express. CO2 : Students will be able to develop backend REST API using Express and learn API Security. CO3 : Students will be able to develop front end apps using React.js and to manage application version controlling using git.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Pre-requisite	Basic Javascript
Course Content	**Unit 1 : Introduction of Full Stack Architecture and Node.js Ecosystem** 1.1. Introduction to Full Stack Architecture 1.2. Components of Full Stack Architecture 1.3. Frontend, Backend 1.4. Architecture of Node.js Ecosystem 1.5. Familiarity with JavaScript 1.6. Installing Node.js 1.7. REPL **Unit 2 : Node.js** 2.1 Module and npm 2.1.1 npm 2.1.2 package.json 2.1.3 The node_modules 2.1.4 require() 2.2 Node concepts 2.1.1 The Event Loop 2.1.2 Asynchronous Coding 2.1.3 Callback Functions 2.1.4 Calling Conventions 2.1.5 Exception Handling 2.1.6 Callback Hell 2.1.7 Event Emitters 2.1.8 Extending EventEmitter 2.1.9 Listening for Events 2.1.10 Promise 2.1.11 async .. await 2.3 Core Modules 2.3.1 Command Line Arguments 2.3.2 Working with the File System 2.3.3 Global objects 2.3.4 File Systems and Streams 2.3.5 Utility Modules 2.3.6 http Module 2.3.7 Routes 2.3.8 Accessing Request Headers 2.3.9 Using TypeScript for Node.js programming

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	3. Express 3.1 Routing 3.2 HTTP Methods 3.3 URL Building 3.4 Middleware 3.5 Templating 3.6 Static Files 3.7 Form Data 3.8 Database 3.9 Cookies 3.10 Sessions 3.11 Authentication 3.12 Working withDatabase Engine like Mongo and Mongoose to insert, update and delete data 3.13 RESTful API 3.14 API Security **4. React.js** 4.1 React.js Introduction 4.1.1 React.js application architecture 4.1.2 Component 4.1.3 JSX Overview 4.2 Virtual DOM and Single Page Application 4.3 Components 4.3.1 Class Components 4.3.2 Functional Components 4.3.3 Nested Components 4.4.4 Conditional and Looping constructs 4.4.5 State 4.4.6 Props 4.5 Event Handling 4.5.1 Event Handling in Class Components 4.5.2 Event Handling in Functional Components 4.6 Component Life Cycle Methods 4.7 React Hooks 4.8 Forms 4.9 Router 4.10 State Management 4.11 Redux 4.12 Calling Backend API **5. Developer Tools** 5.1. Browser Tools 5.2. Version Control using Git and others Tools 5.3. Client side and server side Websocket Programming
Reference Book	1. Node.js 8 the Right Way: Practical, Server-Side JavaScript That Scales--Jim Wilson --Andy Hunt 2. Mastering Node.js - Second Edition: Build robust and scalable real-time server-side web application -- Sandro Pasquali --1st edition – Paperback 3. React Explained: Your Step-by-Step Guide to React, OS Training, LLC 4. Beginning React, Greg Lim 5. Learning React: Functional Web Development with React and Redux, Shroff/O'Reilly 6. Learn React Hooks: Build and refactor modern React.js applications using Hooks, Packt Publishing Limited
Teaching Methodology	Class Room Teaching, Discussion and Assignment

M.Sc.(I.T) 7th Semester

Course : 702 : Advanced .NET

Course Code	702
Course Title	Advanced .NET
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2024
Purpose of Course	This course helps students to understand and use .NET advanced concepts with real world .NET applications.
Course Objective	To impart knowledge of Enterprise application development using .NET Framework.
Course Outcomes	CO1 : Students will be able to learn MVC Core. CO2 : Students will be able to learn about Web API in .NET Core and use it in other apps. CO3 : Students will be able to learn C# language features like tuples, expression bodied members, local/nested functions, delegates & events and LINQ.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Pre-requisite	Object Oriented Fundamental, Basic knowledge of C#, Basic knowledge of web development.
Course Content	**Unit : 1: Introduction to ASP.NET Core MVC and C#.Net Core** 1.1 Introduction to C#.NET Core 1.1.1 Overview of Object Oriented Programming 1.1.2 Classes and Interfaces 1.1.3 Pattern Matching 1.1.4 Tuples 1.1.5 Local / Nested Functions 1.1.6 Expression Bodied Members 1.1.7 Asynchronous Programming 1.2 Overview of ASP.NET Core MVC 1.2.1 MVC Architectural Pattern 1.2.2 Application Architecture 1.2.3 Application Configuration 1.2.4 URL Routing and Routing Configuration 1.2.5 Multiple Environments and Development Mode 1.2.6 NuGet Package and Package Manager 1.2.7 Dependency Injection 1.2.8 Unit Testing and ASP.NET MVC 1.2.9 Working with MVVM Architectural Pattern **Unit : 2 : Data Access and Modeling** 2.1 Generics 2.1.1. Generic Class

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	2.1.2. Generic Members 2.1.3. Generic Interface 2.1.4. Generic Collections 2.2 Entity Framework 2.2.1. Code First Approach 2.2.2. Data First Approach 2.3 LINQ 2.3.1. Writing LINQ Queries 2.3.2. Writing LINQ expressions 2.3.3. LINQ with Objects 2.3.4. LINQ with EF Core 2.4 Anonymous Types 2.5 Working with SQL and No-SQL Data Storage Types **Unit : 3 : Controllers and User Interface** 3.1 ASP.NET Core MVC Controller 3.1.1. Creating a Controller 3.1.2. Role of Controller 3.1.3. Action Methods 3.1.4. Action Result 3.1.5. Action Filters 3.1.6. Data Passing using TempData, ViewBag and ViewData 3.2 Configuring Middleware 3.3 Configuring Services 3.4 Synchronous and Asynchronous Programming 3.5 Consuming Web API and Minimal API 3.6 Working with Razor View 3.6.1. Razor View Engine 3.6.2. Creating Razor View 3.6.3. Binding with Models 3.6.4. Data Manipulation using Razor Pages 3.6.5. Partial View 3.6.6. Shared Layout 3.6.7. Application Navigation and Configuration 3.7 Introduction to Blazor 3.7.1. Project Template and Architecture 3.7.2. Application Configuration 3.7.3. Difference between Blazor and Razor 3.7.4. Creating User Interface using Blazor 3.7.5. Data Manipulation using Razor Pages 3.8 Introduction to MAUI **Unit : 4 : Web Service and Web API** 4.1 Introduction to Web Service 4.2 Working with Web API 4.2.1. Creating ASP.NET Core Web API 4.2.2. Difference between Web Service and Web API 4.2.3. Testing Web API 4.3 Working with Minimal API **Unit : 5 : Hosting, Security and Connection Management** 5.1 Hosting Web Applications 5.2 Dependency Injection 5.3 Security and Identity 5.4 Working with OpenID and OAuth Login

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	5.5 Working with WebSockets and SignalR
Reference Book	1. C# 11 and .NET 7 by Mark J. Price, Packt Publishing Ltd., 2022 2. Learning Blazor by David Pine, O'Reilly, 2022 3. Microsoft Blazor by Peter Himschoot, Apress, 2022 4. .NET Core Microservices - The Complete Guide (.NET 6 MVC) by Bhrugen Patel, Packt Publishing Ltd., 2022
Teaching Methodology	Lectures, Discussion, Independent Study, Seminars and Assignment

M.Sc. (I.T.) 7th Semester

Course : 703 : Software Engineering

Course Code	703
Course Title	Software Engineering
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2024
Purpose of Course	To develop skills of software engineering in students
Course Objective	To provide insights about software engineering project planning, scheduling, SCM fundamentals and pattern based design. Students would be able to do plan, design, analyze risk and manage a software development process efficiently after learning this course.
Course Outcomes	CO1 : Students will be able to understand Software project management and scheduling of software tasks among software development team. CO2 : Students will be able to learn principles of Web development and Agile Software development Methodology. CO3 : Students will be able to learn principles of Software design pattern and Software Quality Assurance activities.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Pre-requisite	Basic concepts of software analysis and design
Course Content	**Unit 1 : Project Management** 1.1 Software Matrices 1.1.1 Project Management 1.1.2 Software Measurements 1.1.3 Metrics for Software Quality 1.1.4 Cost and Efforts Estimation Model 1.2. Project Scheduling 1.2.1 Relationship between People & Effort 1.2.2 Defining a Task set for the Software Project 1.2.3 Selecting & Refining Software Engineering Tasks 1.2.4 Scheduling and tracking techniques 1.2.5 Earned Value Analysis **Unit 2 : Software Risk and Change Management** 2.1. Risk Management 2.1.1 Software Risk 2.1.2 Risk Identification and Categories of Risk 2.1.3 Projection 2.1.4 Refinement 2.1.5 RMMM Plan 2.2. Change Management

	2.2.1 Software Configuration Management 2.2.2 SCM Repository 2.2.3 SCM Process 2.2.4 Version Control and Change Control **Unit 3 : Web Engineering and Agile Software Development** 3.1 Web Development Process 3.1.1 Attributes of web based application 3.1.2 Framework of Web engineering 3.1.3 Analyzing Web-Based system 3.1.4 Design of Web-Based Application 3.1.5 Testing of Web Application 3.1.6 Management Issues 3.2 Agile Methodology 3.2.1 Extreme Programming Adaptive Software Development 3.2.2 Dynamic systems Development Method 3.2.3 Scrum Method 3.2.4 Feature Driven Development 3.2.5 Agile Tools and Testing **Unit 4 : Software Design patterns** 4.1 Design Pattern Principles and Techniques 4.2 Software Architecture 4.3 Types of Design patterns 4.3.1 Creational pattern 4.3.2 Structural pattern 4.3.3 Behavioral pattern **Unit 5 : Advanced Software Engineering** 5.1 Software Quality Assurance 5.2 Quality Standards: ISO 2000, CMM, Six- Sigma 5.3 Service Oriented software engineering 5.4 Software engineering for Cloud Computing and AI 5.5 CASE tools and its effect 5.6 Component based Software systems 5.7 Mobile Development Process 5.8 Software Engineering issues in Embedded Systems 5.9 Emerging trends in Software Engineering
Reference Book	1. Software Engineering A practitioner's approach – Roger S Pressman - Seventh Edition- McGraw Hill 2. An Integrated Approach to Software Engineering – Pankaj Jalote – Narosa 3. Software quality assurance – from theory to implementation- Daniel Galin- Pearson education 4. Software Engineering- A programming approach- D. Bell, I. Morrey-PHI 5. Design Patterns: Elements of Reusable Object-Oriented Software, John Vlissides, Ralph Johnson, Richard Helm, Erich Gamma, , Addison-Wesley
Teaching Methodology	Class Room Teaching, Discussion and Assignment

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M.Sc. (I.T.) 7th Semester

Course: 704 Data Analysis using Python

Course Code	704
Course Title	Data Analysis using Python
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2024
Purpose of Course	The Purpose of course is to help understanding the concepts of Python Programming and it's applications. The course also provides students with the skills necessary to develop Python programs and evaluate them.
Course Objective	The objective of the course is to impart knowledge of Python Programming, Python Libraries and Exploratory Data Analysis (EDA).
Course Outcomes	CO1 : Students will be able to understand the concepts of Python programming and it's applications. CO2 : Students will be able to demonstrate in-depth knowledge of Python Construct, Python libraries and Data Vizualization. CO3 : Students will be able to learn the use of Python libraries for Exploratory Data Analysis (EDA).
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Pre-requisite	Basic knowledge problem solving.
Course Content	**Unit 1 : Introduction to Python** 1.1. Features of Python 1.2. Python Environment Set-up 1.3. Working with Script files in Python 1.4. Python variables and Data Types 1.5. Python Operators - Comparison, Logical and Identity 1.6. Working with Python Strings and it's inbuilt functions 1.7. Python Conditional statements 1.8. Python User Define Functions and Lambda Expressions 1.9. Python Iterations 1.10. Matrix, Scalars and Vectors 1.11. Arrays in Python 1.12. Addition and Subtraction of matrices 1.13. Dot Product of matrices **Unit 2 : Python Sequences** 2.1 Working with Lists 2.1.1 Indexing and Slicing 2.1.2 Iterating and Merging 2.1.3 Built-in Functions 2.1.4 List Comprehension and Multidimensional Lists 2.2 Working with Tuples 2.2.1 Indexing and Slicing 2.2.2 Iterating and Merging 2.2.3 Operations on Tuples 2.2.4 Built-in Functions 2.3 Working with Dictionaries 2.3.1 Indexing and Slicing 2.3.2 Iterating and Merging

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	2.3.3 Built-in Functions 2.3.4 Operations on Dictionaries and Nested Dictionaries **Unit 3 : Working with Python Libraries** 3.1 Working with Numpy 3.1.1 Numpy Arrays - ndarrays 3.1.2 Indexing, Slicing and Merging 3.1.3 Numpy Arithmetic Operations 3.1.4 Array shape manipulation and sorting 3.1.5 Saving and Loading Array 3.2 Working with Pandas 3.2.1 Pandas data structures - Series and Data Frames 3.2.2 Reading data from CSV and TXT file and databases 3.2.3 Indexing, Slicing and Merging 3.2.4 Data Frame Row/Column manipulation 3.2.5 Filtering(Query) operations 3.3 Introduction to Pytorch, Tensor Flow, Keras and Scipy **Unit 4 : Data Visualization and Exploratory Data Analysis** 4.1 Introduction to Plot 4.1.1 Line Appearance and Multiple Lines 4.1.2 Axis, Tricks and Grid 4.1.3 Labels, Annotation and Legends 4.2 Data Visualization with Matplotlib 4.2.1 Scatter plot 4.2.2 Line plot 4.2.3 Bar plot 4.2.4 Histogram 4.2.5 Box plot 4.2.6 Pie plot 4.3 Getting insights into Dataset 4.4 Handling Missing Values 4.5 Data Encoding and Data Normalization 4.6 Handling Correlation 4.7 Handling Outliers 4.8 Covariance and Correlation **Unit 5 : Files, OOps and Modules** 5.1 I/O operations on File 5.1.1 Create and read file 5.1.2 Modify and delete file 5.2 Object Oriented Programming in Python 5.2.1 Class and Object Creation 5.2.2 Python initializers 5.2.3 Inheritance and Polymorphism 5.3 Working with Modules 5.3.1 Creating a Module 5.3.2 Importing a Module 5.3.3 Python in-built Modules
Reference Books:	1. Python : The Complete Reference by Martin C. Brown, McGrawHill publication. 2. Python Programming by Ch Satyanarayana, M Radhika Mani and B N Jagadesh, Universities Press Publication 3. Python Programming by S. Sridhar, J.Indumathi and V. M. Hariharan, Pearson Publication. 4. Python Distilled by David M. Beazely, Pearson Publication. 5. Introduction to Python for Engineers and Scientists by Sandeep Nagar,Apress Publication. 6. Python : Visual Quick Start Guide by Toby Donaldson, Pearson Publication.
Teaching Methodology:	Lectures, Discussion, Independent Study, Hands-on-Session, Seminars and Assignment

M.Sc. (I.T.) 7th Semester

Course : 705 : Practical 15

Course Code	705
Course Title	Practical 15
Credit	3
Teaching Per Week	3 Hrs
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Review/Revision	June 2024
Purpose of Course	The course provides practical knowledge of web application development using full stack development frameworks like Node.js, React.js, Express, etc.
Course Objective	The course prepares students to develop applications using full stack development frameworks like Node.js, React.js, Express, etc.
Course Outcomes	CO1 : Students will be able to develop MVC based programs using NODE.JS, Express. CO2 : Students will be able to develop backend REST API using Express and implement API Security. CO3 : Students will be able to develop front end apps using React.js and implement version controlling using git practically.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Prerequisite	Object Oriented Programming Concepts
Course Content	Practical based on Paper No. 701 - Application Development using Full Stack.
Reference Books	NIL
Teaching Methodology	Lab Work

M.Sc. (I.T.) 7th Semester

Course : 706 : Practical 16

Course Code	706
Course Title	Practical 16
Credit	3
Teaching Per Week	3 Hrs
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Review/Revision	June 2024
Purpose of Course	The course provides practical knowledge of C#, LINQ, .NET Core, MVC and Python Programming.
Course Objective	The course prepares students to develop .NET based web applications and Python programs.
Course Out comes	CO1 : Students will be able to develop Web API in .NET framework and .NET Core and use it in other apps. CO2 : Students will be able to implement C# language features like tuples, expression bodied members, local/nested functions, delegates & events and LINQ practically. CO3 : Students will be able to develop Python programs with inheritance, polymorphism and other features.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Prerequisite	Object Oriented Programming Concepts
Course Content	Practical based on Paper No. 702- Advanced .NET and Paper 704 - Data Analysis using Python.
Reference Books	NIL
Teaching Methodology	Lab Work

P. Y. Desai

M.Sc. (I.T.) 7th Semester

Course: 707: Part Time Project 1

Course Code	**707**
Course Title	**Part Time Project 1**
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Effective From	June 2024
Purpose of Course	The project work is introduced to make students implement their theory and practical knowledge they learned during this semester to solve real life problems for software applications.
Course Objective	To help students to develop software applications using React.js, Node.js and .NET.
Course Outcomes	CO1 : Students will be able to develop project using different technologies like React.js, Node.js and .NET. CO2 : Students will be able to apply software engineering concepts to solve real world problems. CO3 : Students will be able to apply database related concepts to design database for the project.
Mapping between COs with PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Pre-requisite	Knowledge of Object Oriented Programming, Web Technology Fundamentals, Software Engineering.
Course Content	The students must prepare documentation of the project completed as per the Software Engineering Guidelines. At the end of the semester, the students have to submit their project report in bounded form to the institution. The Project Presentation and Viva – Voce will be conducted as per the University exam schedule. The students have to submit the following reports at the institution: 1. Project Joining Report 2. Project Title Report 3. Progress Report 4. Project Completion Certificate 5. Institution Certificate 6. Non-disclosure of Source Code Certificate (In case the student is unable to demonstrate project source code) Note : If a student's performance is not satisfactory then as per the direction of the internal project guide / external examiner student may have to do coding in the lab according to the project work submitted during internal submission / external examination.
Reference Books	NIL
Teaching Methodology	Project guidance

P. M. Desai