Course: 501-1: Advanced Web Designing

Course Code	501
Course Title	Advanced Web Designing
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2021-2022
Implementation Year:	A.Y. 2022-2023
Purpose of Course	Understand the technical foundations, as well as the non-programming / administrative skills needed to be a successful web developer. This course reveals the reasons why a truly successful website developer does more than write code. The course deals with both the Frontend (client-side) and Backend (server-side) of a tech product. This course deals with designing of websites and building the APP.
Course Objective	The students will learn the whole React WebApp building process, from pc to the server. They will work with NoSQL databases. They will learn the whole process of building your App using React.js. At the end of the course, they will develop modern, complex, responsive and scalable web applications with Angular.
Pre-requisite	305-01: Web Designing -1 course of Semester-3. 405-01: Web Designing -2 course of Semester-4.
Course outcome	• Students will be able to develop modern, complex, responsive and scalable websites. • Understand necessary functionalities and elements of clint and server-side development of website.
Course Content	**Unit-1: Concepts of NoSQL: MongoDB** 1.1 concepts of NoSQL. Advantages and features. 1.1.1 MngoDB Datatypes (String, Integer, Boolean, Double, Arrays, Objects) 1.1.2 Database creation and dropping database 1.2 create and Drop collections 1.3 CRUD operations (Insert, update, delete, find, Query and Projection operators) 1.4 Operators (Projection, update, limit (), sort ()) and Aggregation commands **Unit-2: Fundamentals of React.js** 2.1 Overview of React 2.1.1 Concepts of React. 2.1.2 Using React with HTML 2.1.3 React Interactive components: Components within components and Files 2.1.4 Passing data through Props 2.2 Class components 2.2.1 React class and class components 2.2.2 Conditional statements, Operators, Lists 2.2.3 React Events: Adding events, Passing arguments, Event objects **Unit-3: Forms and Hooks in React.JS** 3.1 Forms: (Adding forms, Handling forms, Submitting forms) 3.1.1 event.target.name and event. Target.event, React Memo 3.1.2 Components (TextArea, Drop down list (SELECT)) 3.2 Hooks: Concepts and Advantages 3.2.1 useState, useEffect, useContext 3.2.2 useRef, useReducer, useCallback, useMemo 3.2.3 Hook: Building custom hook, advantages and use **Unit-4: Angular JS** 4.1 Concepts and characteristics of Angular JS 4.1.1 Expressions in Angular JS (Numbers, Strings, Objects, Arrays)

	4.1.2 Setting up Environment, Angular JS Filters 4.1 3 Understanding MVC (Model, View, Controller) architecture 4.2 AngularJS Directive (ng-app, ng-init, ng-controller, ng-model, ng-repeat) 4.2.1 Some other directives: ng-class, ng-animate, ng-show, ng-hide 4.2.2 Expressions and Controllers 4.2.3 Filters (Uppercase, Lowercase, Currency, order by) **Unit-5: Angular JS: Single page application:** 5.1 Single page application using AngularJS 5.1.1 Create a module, Define Simple controller 5.1.2 Embedding AngularJS script in HTML 5.1.3 AngularJS's routine capability 5.1.3.1 $routeProvider service from ngRoute 5.1.3.2 Navigating different pages 5.2 HTML DOM directives 5.2.1 ng-disabled, ng-show, ng-hide, ng-click 5.2.2 Modules (Application, Controller) 5.2.3 Forms (Events, Data validation, ng-click) [All Units carry Equal Weightage]
Reference Books	1. Web Development with Node and Express, Ethan Brown, O'Reilly Media, Inc., ISBN: 978-1-491-94930-6 2. Node.js, MongoDB, React, React Native Full-Stack Fundamentals and Beyond, Eric Bush, Blue Sky Productions Inc., ISBN: 978-0-9971966-8-9 3. MongoDB Fundamentals: A hands-on guide to using MongoDB and Atlas in the real world, Amit Phaltankar, Juned Ahsan, Michael Harrison, Liviu Nedov , ISBN:978-1-83921-064-8 4. Sams Teach Yourself NoSQL with MongoDB in 24 Hours, Pearson Education ISBN-13: 9780672337130 5. MongoDB Basics, David Hows, Peter Membrey, Eelco Plugge, Apress, ISBN-13 (electronic): ISBN:978-1-4842-0895-3 6. Fullstack React: The Complete Guide to ReactJS and Friends, Anthony Accomazzo, Lean Publishing, Ari Learner, Clay Allsopp, David Guttman, Tyler McGinnis, Nate Murray, 7. The Road to React: Your journey to master React.js in JavaScript, by Robin Wieruch 8. Beginning React Native with Hooks, Greg Lim 9. Full-Stack React Projects: Learn MERN stack development by building modern web apps using MongoDB, Express, React, and Node.js, 2nd Edition 10. Angular From Theory To Practice, Asim Hussain, Version 1.2.0, 2017-11-24 11. Angular: Up and Running: Learning Angular, Step by Step, Shyam Seshadri, O'Reilly Media, Inc. 12. Mastering Web Application Development with AngularJS, Pawel Kozlowski Peter and Bacon Darwin, Packt Publishing
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 501-02 - Advanced Mobile computing

Course Code	501-02
Course Title	Advanced Mobile computing
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	February, 2022
Implementation	A.Y.2022-2023
Purpose of Course	Mobile application development with Kotlin is a modern programming language that brings together the best of object-oriented and functional programming. Kotlin remains one of the most widely used and fastest-growing programming languages in recent years. The demand for Kotlin is on the rise and it will continue to grow in the years to come. Exchanging data between application is also most popular. It is essential to perform database operation on Android application such as storing, manipulating or retrieving data from database. Knowledge about all this concept in Android platform is enhance the skills.
Course Objective	1) To understand the concept of Kotlin 2) Developing basic application 3) To understand various concepts of JSON, building multiple screen application and use of Intent in application. 4) Concepts of storing Android application data into database
Pre-requisite	Paper-305-02 (Mobile Application Development -1) in Semester-3. Paper-405-02 (Mobile Application Development -2) in Semester-4.
Course outcome	- Students will be able to understand the concepts Kotlin - Students will have knowledge of object-oriented concept and development of basic apps using Kotlin - Working with JSON - Knowledge of storing data into database
Course Content	**Unit-1: Introduction to Kotlin** 1.1 Concepts of Kotlin and its introduction. 1.2 Downloading IntelliJ and its settings. 1.3 Variables: 1.3.1 val vs. var, Byte, Short, Int, Long, Float, Double, Boolean, and Char. 1.3.2 String, Nullable variables. 1.4 Conditional statements: if and when. Difference between if and when. 1.4.1 ranges, types, values of function calls 1.5 Arrays and Lists: 1.5.1 create, modify, and access arrays 1.5.2 creating, modifying, and accessing lists 1.6 Loops (Iterative statements) 1.6.1 for and while loop. 1.6.2 break, continue and return **Unit-2: OOPS Concepts with Kotlin** 2.1 Object oriented concepts: 2.1.1 Properties, methods and basics of objects and classes in Kotlin 2.1.2 Named parameters, constructors. 2.2 open classes and inheritance. 2.2.1 Named parameters and Default values 2.2.2 Open and Abstract 2.2.3 Interface 2.2.4 Getters and Setters 2.2.5 visibility of properties, methods and class **Unit-3: Kotlin Apps**

	3.1 Developing basic Apps using Kotlin 3.1.1 Setup Play Project, The Constraint Layout 3.1.2 Constraints and Resizing, Positioning Widgets, Inner Lines within a Widget 3.1.3 Layouts on Different Devices, Layout Designer rendering error 3.1.4 Baseline Constraints 3.2 Constraining Widgets, Add Scrolling Capabilities 3.2.1 Events and setonclicklistener 3.2.2 Fixing Kotlin Gradle Issues 3.2.3 The Activity Lifecycle 3.2.4 The Logcat Pane 3.2.5 Logging the Activity Lifecycle 3.2.6 Saving and Restoring Instance State **Unit-4: JSON Concept** 4.1 Concept and Features of JSON, Similarities and difference among JSON and XML 4.2 JSON objects (with string and Numbers)) 4.3 JSON Arrays and their examples: 4.3.1 Array of string, Array of Numbers, Array of Booleans, Array of objects, Multi-Dimensional Arrays 4.3.2 JSON comments 4.4 Building multi-screen apps: 4.4.1 Intents and their applications, types of intents, 4.4.2 Data exchange from one activity to another using intent 4.5 Working with implicit intents: 4.5.1 Opening web URLs through app 4.5.2 Sharing media from our app to other apps **Unit-5: Storing Android application data using Database and JSON** [Any open-source database can be used. MySQL or SQLite is preferable] 5.1 Setting up virtual server on local computer 5.2 Connecting Android based App with Database 5.3 CRUD operations (Create, Read, Update, Delete) using APP: 5.3.1 Create and insert data to the database 5.3.2 Read, Update and Delete data from database. 5.4 Accessing user's current location 5.5 Capturing image using device camera (ACTION_IMAGE_CAPTURE Intent of MediaStore class.) [All Units carry Equal Weightage]
Reference Books	1. Android Studio 4.0 Development Essentials – Kotlin Edition, Author – Neil Smyth, Publisher: Payload Media, ISBN – 13: 978 – 1 – 951442 – 19 – 4 2. Android Programming with Kotlin for Beginners, Author – John Horton, Publisher: Packt Publication, ISBN – 13: 978 – 1789615401 3. Mastering Kotlin - Learn advanced Kotlin programming techniques to build apps for Android, iOS, and the web, Author – Nate Ebel, Publisher: Packt Publication, ISBN – 13: 978 – 1838555726 4. Kotlin in Action 1st Edition, Author – Dmitry Jemerov & Sevtlana Isakova, Publisher: Manning Publications Co., ISBN – 13: 978 – 1617293290 5. JSON Quick Syntax Reference, Author – Wallace Jackson, Publisher: Apress, ISBN: 9781484218631 6. Beginning Json, Author – Ben Smith, Publisher – Apress, ISBN: 9781484240427 7. Android Studio 3.0 Development Essentials: Android 8 Edition Author – Neil Smyth, Publisher: Payload Media, ISBN – 13: 978 – 1977540096
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 502 - UNIX and Shell Programming

Course Code	502
Course Title	UNIX and Shell Programming
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2021-2022
Implementation	A.Y.2022-2023
Purpose of Course	To provide basic knowledge and working of Multi-User Operating System – UNIX. The course includes CLI mode with BASH, I/O redirections, Init System, Processes, Users and Groups, File Systems, Files, Ownership, Permissions etc. It also includes VI text editor for creating shell scripts.
Course Objective	Unix provides an essential and simple set of tools in a distraction-free environment. The students will learn to write little pieces of software in a programming language called Bash, which allows to use and to connect together the UNIX tools.
Pre-requisite	Fundamental Knowledge of Operating System.
Course outcome	• Students will have practical introduction to commonly used Linux / UNIX shell commands and basics of Bash shell scripting to automate a variety of tasks. • Students will learn general purpose commands, directory management commands, file management commands, access control commands, text processing commands, etc with shell scripts. • Students will create simple to more advanced shell scripts that involve Metacharacters, Quoting, Variables, Command substitution, I/O Redirection, Pipes & Filters, and Command line arguments.
Course Content	**Unit - 1. Introduction of UNIX OS** 1.1. Features 1.2. System Structure and Architecture of UNIX OS 1.3. Shell & its Features 1.4. Kernel & its Structure **Unit 2. Overview** 2.1. Logging in & out 2.2. I-node and File System Structure 2.3. Booting Sequence & 'init' process 2.4. File Access Permissions **3. Shell Programming** 3.1. Screen Editor (vi) 3.2. Environmental & user defined variables 3.3. Conditional Execution 3.4. Arithmetic expression evaluation 3.5. Control Structure 3.6. Redirection 3.7. Background process & priorities of process, Batch Process 3.8. Argument Processing & Shells interpretation **Unit 4. Advanced Shell Programming** 4.1. Splitting, Comparing, Sorting, Merging & Ordering Files 4.2. Filtering utilities: grep, sed etc. 4.3. awk utility **Unit 5. Communication with other users** 5.1 write, wall and mesg 5.2 mail, motd and news

	[All Units carry Equal Weightage]
Reference Books	1. Unix Shell Programming, 3rd Edition Stephen G Kochan, Patrick Wood Sams Publishing 2. sed & awk, 2nd Edition Dale Dougherty, Arnold Robbins O'Reilly Media 3. The UNIX Programming Environment Kernighan & Pike PHI 4. The design of the UNIX OS M. J. Bach - Prentice Hall 5. Operating Systems A. S. Godbole Tata McGrew Hill 6. Working with UNIX Vijay Mukhi BPB Publications 7. UNIX Shells Vijay Mukhi BPB Publications. 8. UNIX System Concepts & Applications Das Tata McGraw Hill. 9. UNIX & Shell Programming Yashwant Kanetkar BPB Publications. 10. UNIX: The Complete Reference, Second Edition - Kenneth H.Rosen, Douglas A. Host,Rachel Klee, James Farber, Richard Rosinski - 2007 by The McGraw-Hill Companies
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 503 - Network Technologies

Course Code	503
Course Title	Network Technologies
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2021-2022
Implementation	A.Y.2022-2023
Purpose of Course	With extensive use of Internet and Network at offices, it has now become quite essential for students of IT and Computer Science to acquire basic knowledge of Computer Networks. The purpose of this course is to provide basic knowledge of Computer Networks.
Course Objective	The objective is to provide basic knowledge of network components, network operating system, working of networking and security on networks.
Pre-requisite	Fundamental Knowledge of Operating System.
Course outcome	Students will get knowledge of networking, OSI model, configuration & troubleshooting of different network topologies using various network devices.
Course Content	**Unit-1: Introduction to Network** 1.1 Basics of network 1.1.1 Types of networks 1.1.2 Different topologies (Bus, ring, star, mesh, tree) 1.2 Types of networks (LAN, MAN, WAN) 1.3 Terminologies (Intranet, Internet, Unicast, Broadcast, Multicast) **Unit-2: Internet and Intranet** 2.1 Concepts of Internet and Intranet 2.1.1 Working of Internet and its architecture 2.1.2 Working of Intranet and its architecture 2.1.3 Network Devices terminologies: Hub, modem, switch, Routers, Gateways, Access point 2.2 Types of Cables: co-axial, UTP, Fiber Optic cable **Unit-3: Mobile Ad hoc network** 3.1 Concepts and types of MANET (Mobile Ad hoc network) 3.1.1 VANET (Vehicular Ad hoc Network) 3.1.2 Smart phone Ad hoc Network (SPANC) 3.1.3 Flying Ad hoc network (FANET) 3.2 concepts of OSI(Open Source Interconnection) layers 3.2.1 types of layers 3.2.2 Introduction of OSI Layers and their purpose: Physical layer, Data link layer and Network Layer Transport layer and Session Layer. **Unit-4: Important protocols of Network layers** 4.1 Concepts of Data packets and Datagram 4.2 Concepts and purpose of various protocols: 4.2.1 Purpose of Presentation layer 4.2.2 Presentation layer protocols and their purpose: 4.2.2.1 SSL, HTTP, FTP, Telnet 4.2.3 Concepts of Application Layer protocols and terminologies: 4.2.3.1 SMTP, DNS (Domain Name Server), POP (Post office Protocol) 4.3 Concepts of IP address

	4.4 Difference between http and https **Unit-5: Mail Services** 5.1 Application Layer services: 5.1.1 concepts of email 5.1.2 working of email account and services 5.1.3 URL and URL types (Absolute, Relative) 5.2 Case study of email: 5.2.1 From sender to receiver (Mailer, Mail Server, Mailbox) 5.2.2 Functionality and use of protocols at different layers 5.3 Case study of locating Website: 5.3.1 URL and locating URL 5.3.2 Steps and protocols involved in accessing URL 5.3.3 Concepts of search engine and purpose. [All Units carry Equal Weightage]
Reference Books	1. Networking Complete – 3 rd Edition – BPB Publications 2. Networking Essentials Study Guide – MCSE – Tata McGraw Hill Publication 3. Computer Networks – A S Tanenbaum - PHI 4. Data Communication & Networking – B A Forouzan – Tata McGraw Hill Publication 5. Computer Networks – Bhushan Trivedi – Oxford University Press
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 504: Web Framework and Services

Course Code	504
Course Title	Web Framework and Services
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2021-2022
Implementation	A.Y. 2022-2023
Purpose of Course	To make students aware of Open Source Web Based Tools and Database
Course Objective	1. To make students understand the concepts of Open Source Web Based Dynamic Scripting Language. 2. To make students understand the concepts of Open Source Database.
Pre-requisite	Basic knowledge of Scripting Language & HTML and Python.
Course outcome	Ability to develop Web Based Applications.
Course Content	**Unit-1: PHP fundamentals** 1.1 Concepts of Php and introduction 1.2 Php syntax: variables, constants, echo and print commands 1.3 Data types 1.4 Operators, Conditional Statements (if. Else, Switch. Case), Arrays 1.5 Sorting Arrays, Php Loops **Unit-2: PHP functions** 2.1 Math functions, Date and Time functions, GET and POST methods 2.2 Files: include, file parsing, directories, file upload, file download 2.3 Cookies and Sessions, Send Email 2.4 Forms: creating, handling, validation of forms, Php filters, Json parsing 2.5 Classes and objects in Php 2.6 Regular expressions and exception handling **Unit-3: PHP interaction with Database** [MySQL / MongoDB or any other database can be used] 3.1 Create database, Create table, Table handling: insert, update, delete operations. 3.2 Querying database using Php: select, update, delete, insert, where, order by 3.3 Processing search query in backend using Ajax **Unit-4: PHP – Python integration** 4.1 Executing python script using PHP: 4.1.1 Calling Python script using echo 4.1.2 Calling Python script using escapeshellcmd() , shell_exec() method 4.2 Executing PHP script using Python: 4.2.1 subprocess module in Python: 4.2.1.1 Methods: check-call(), check-output(), declode(), Popen() , communicate(), split() 4.2.2 os module in Python: 4.2.2.1 write(), read(), close(), mkdir(), makedirs(), path, exists(), isfile(), join() 4.2.2.2 isdir(), listdir(), walk(), chdir()

	Unit-5: Python Web Framework: Flask 5.1 Installation of Flask and Environment setup 5.1.1 Web server Gateway Interface 5.1.2 Web template engine (Jinja2) 5.1.2 creating the Flask class object 5.1.3 creating and hosting first basic Flask app. 5.1.3.1 route() , run(), add_url_rule() 5.2 URl building and its advantages 5.2.1 url_for() function 5.3 Flask HTTP methods: 5.3.1 GET, POST, HEAD, PUT, DELETE 5.3.2 Dynamic data representation using Jinja2. 5.3.2.1 Jinja2 Delimiters 5.3.2.2 Embedding Python statement in HTML 5.3.2.3 Static File reference in HTML 5.4 Flask request object: (Form, args, files, redirect) 5.4.1 Form request object, render_template() method, Form data Handling 5.4.2 Flask Session, Creating session, session variable, session.pop() 5.4.3 file uploading: request.files[] object, save() method, saving file to specific folder. 5.4.4 Redirecting : redirect() method, location, status code and response. [All Units carry Equal Weightage]
Reference Books	1. Core PHP Programming – Leon Atkinson – Pearson Publishers – ISBN 978- : 0130463463 2. The Complete Reference PHP – Stever Holzner – McGraw Hill – ISBN 978- : 0070223622 3. PHP 5.0 and MySql Bible – Tim Converse, Joyce Park, Clark Morgan John – Wiley & Sons – ISBN 978-0764557460 : 4. MySQL Bible – Steve Suehring John – Wiley &Sons – ISBN 978- : 0764549328 5. PHP Black Book – Peter Moulding – Paraglyph, Incorporated – ISBN 978- : 1932111095 6. PHP and MongoDB Web Development Beginner's Guide – Rubayeet Islam – Packt Publishing Limited – ISBN : 978-1849513623 7. Beginning Ajax with PHP: From Novice to Professional - Lee Babin – Apress – ISBN 978-1590596678 : 8. Developing Web Applications in PHP and AJAX – B. M Harwani – McGraw Hill Education – ISBN 978-0070144521 : 9. JSON: Main principals – David V. 10. Python 101 – Michael Driscoll – ISBN : 9780996062817 11. Flask: Building Python Web Services – Gareth Dwyer, Shalabh Aggarwal, Jack Stouffer – Packt Publishing – ISBN : 9781787288225 12. Building Web Apps with Python and Flask – Malhar Lathkar – BPB PUBN – ISBN : 9789389898835
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: 505 - ASP.Net

Course Code	505
Course Title	ASP.NET
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2021-2022
Implementation	A.Y.2022-2023
Purpose of Course	To make students aware of Web Based Tools and Database
Course Objective	To make students understand concepts of Web Technology
Pre-requisite	Basic knowledge of Scripting Language & HTML.
Course outcome	Student will get good hands on experience to develop, manage and maintain Web based application.
Course Content	**Unit-1. Introduction to ASP.NET** 1.1 What is ASP.NET 1.2 .Net framework 2.0 1.3 Compile Code 1.3.1 Code Behind and Inline Coding 1.4 The Common Language Runtime 1.5 Object Oriented Concepts 1.6 Event Driven Programming **Unit-2. Server Control** 2.1 Post back 2.2 Data Binding 2.2.1 Grid View 2.2.2 List Box 2.2.3 Data list 2.2.4 Data binding Events 2.2.5 Repeater 2.2.6 Form view 2.3 Web Server Controls, HTML Server Controls (basic HTML Server Control), Validation Controls, Navigation Controls, Login Control 2.4 Master Page, Themes & CSS **Unit-3. Database Access** 3.1 Introduction about ADO.NET 3.2 Introduction about Provider, Adapter, Reader, Command Builder 3.3 Database Access using ADO.NET **Unit-4. Client Server Communication** 4.1 Communications with Web Browser 4.2 Response Object 4.3 Cookies 4.4 Query String 4.5 Session Management and Variable Scope **Unit-5. Advance ASP.NET** 5.1 Web.config 5.2 Sitemappath Server Control 5.3 User Control 5.4 User Profile 5.5 Web Services 5.5.1 Basics of Web Services

	5.5.2 Interacting with web services 5.6 Error Handling 5.6.1 Unstructured Error 5.6.2 Structured Error 5.6.3 Error handling in Database [All Units carry Equal Weightage]
Reference Books	1. ASP.NET – A Beginner's Guide by Dave Mercer – TMH 2. ASP.NET Bible – Mridula Parihar et. Al. – Wiley India 3. Programming ASP.NET 4 – Dino Esposito 4. Professional ADO.NET – Bipin Joshi, Donny Mack, Doug Seven, Fabio Claudio Ferracchiati, Jan D Narkiewiez - Wrox 5. ASP.NET for Developers – Amundsen 6. The Complete Reference ASP.NET -Matthew MacDonald –TMH 7. ASP.NET – Black Book – dreamTech 8. Beginning ASP.NET 3.5 in C# and VB –Wrox-Imar Spaanjaars
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.

Course: Foundation Elective (FND – 05)

Course Code	FND-05
Course Title	Foundation Elective
Credit	2
Teaching / Week	-
Minimum Weeks/Semester	-
Review/Revision	2021-2022
Implementation Year	A.Y.2022-2023
Purpose of Course (POC)	To enhance the student's capabilities in terms of extra curriculum activity or by gaining additional knowledge in any field including their core subjects.
Course Objective	Make students to participate and learn new technology or any multi-disciplinary subject by joining university approved 2 credit certificate course. Students are encouraged to participate in sports/NSS/NCC and contribute at University level or state level or National level.
Pre-requisite	No specific requirement.
Course Outcome	Students will be able to obtain additional 2 credits by active participation in field of NSS/NCC/Sports/ Certificate course.
Structure of the Course:	Students are required to select any one from the following and produce the evidence. Additional 2 credits will be granted to the students on recommendation by the principal on fulfilment of any of the following criteria during the semester. 1) Active participation in NSS/ NCC at University level / State level / National level and produce the certificate. 2) Active Participation in any one Saptdhara/Sports activity and representation at University level / State level / National level and produce the certificate. 3) Successful completion of any minimum two credit course recognized by the University from any university affiliated institution. The credits will be granted on producing the completion certificate. (Certification course fees will be bared by the student only. The Institute/College is not liable to provide such certificate course. It is an optional activity in lieu of NSS/NCC/Sports.)
Evaluation Method:	On producing the supporting document as per the need described in Structure of Course.

Course: 506: Practical and Project

Course Code	506
Course Title	Practical
Credit	6
Teaching per Week	**Lab. Practical Duration:** 10 Hours per week (5 Hours under Supervised mode and 5 Hours under un-supervised mode) **Lab. Project Duration:** 2 Hours per week (1 hour under Supervised mode and 1 hour under Un-Supervised mode)
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)
Review / Revision	2021-2022
Implementation	A.Y.2022-2023
Purpose of Course	To acquire practical and applied knowledge related to subjects studied during the semester.
Course Objective	Students can learn applied subjects (P-501-1 or P-501-2, P-502, P-504, P-505) during lab hours under supervised and un-supervised mode. Students can apply their practical knowledge by developing a limited size in-house(minor) project.
Pre-requisite	Basic knowledge of Semester 3 and Semester 4 subjects including scripting languages, HTML, Object Oriented Concepts, Java and Python programming, Web Technologies, Android Technologies and Database concepts.
Course outcome	After completion of this course, the students will be able to create web based or Android based Applications. Also, they will be able to implement practical problems in UNIX Shell Programming, PHP-Python, and ASP.NET application.
Course Content	**(i) Minor Project:** During allocated project hours' students apply their knowledge by generating limited duration in-house minor project for any of the subject out of 501-01 or 501-02. **(ii) Practical:** Students gain hands-on practical knowledge for Paper code: 502, 504 and 505 during practical hours under supervised and un-supervised mode.
Reference Books	As per Courses: 501-1 or 501-2, 502, 504, 505 reference books.
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Max. Marks:	Practical Exam: 140 Marks (External Exam) + 60 marks (Internal Exam) External: 105 marks for Practical exam + 35 marks for project viva Internal: 45 marks for Practical exam + 15 marks for Project viva
Evaluation Method	(i) Students will develop an in-project based on any of the 501-01 or 501-02. One internal guide will be allocated to the student. The student can form a group or perform individually to work on the given project topic. Per week 2 hours of lab. timing is expected to allocate in un-supervised mode. At end of the semester, the students are required to submit their project report verified by their internal guide. The external exam for project performance evaluation will be conducted separately where students are expected to present their project content and face the viva-voce. Allocated marks for **External Exam:** 35 marks **Internal Exam:** 15 marks (ii) Students will work in computer lab during the allocated practical time in supervised and un-supervised mode. During lab hours, students are expected to work and implement various given problems based on subjects covered under paper-502, paper-504 and paper-505. Allocated marks for **External Exam:** 105 marks **Internal Exam:** 45 marks.
External Practical and Project Exam:	• **Duration:** 4 Hours for Practical exam and 1 Hour for Project exam (Project demo and viva). • **Passing Criteria:** The final result for 506- Practical and Project will be based on consolidated Marks combining Practical and Project out of 140 for External and 60 for Internal exams.