RKUNIVERSITY

SYLLABUS

Course Title	**Object Oriented Programming with JAVA**
Course Code	**MCAL222**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Understand** the concepts of OOP and Java programming constructs
- **Understand** the principles of packages, interfaces and file handling
- **Design** attractive user interface using Swing
- **Apply** Multithreading and OOP concepts in real life problems solution with/without a database
- **Develop** robust application by demonstrating professionally acceptable coding

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	SECTION-I	
1.	**Introduction to JAVA** Overview of Object Oriented Programming Concepts, Features of Java Language, Architecture, Introduction to JDK, JVM, JRE, Structure of Java Program, Comments, Data types, Variables, Operators, Control Statements, Type conversion, String manipulation, Annotation, Enumeration, Command Line Arguments	**03**
2.	**Class and Object** Defining a Class, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Collections (List, Vector, Queue, HashSet, and ArrayList), Wrapper Class	**03**
3.	**Inheritance and Interfaces** Types of Inheritance, Subclass constructor, Method Overriding, Final Keyword, finalize method, visibility of field, inner class, Create Interfaces, Implement Interfaces, Access Interface Variables.	**04**
4	**Packages** Introduction, System Packages, Creating Packages, Accessing Packages	**02**

5	**Exception Handling** Types of errors, Exceptions, Structure of Exception Handling Code, Multiple Catch Statements, Using finally Statement, throw Statement, throws Statement, User Defined Exceptions, Use of Exception.	**02**
	Total	**14**
	SECTION-II	
6.	**Multithreading** Introduction, Java Thread Model, Creating Threads, Extend Thread class, Using Thread Methods, Thread Exceptions, Thread Priority.	**03**
7.	**Input/output and File handling** I/O Streams, File Class, byte stream, File Handling, Filtered byte streams, Object Streams, Character Stream, Random Access File.	**04**
8.	**GUI in Java** Introduction to AWT, Basic of Swing, Swing Components – "JButton, JLabel, JTextArea, JRadioButton, JFrame, JPanel"	**02**
9.	**Event Handling** Event Delegation Model, Event classes, The sources of events, The Event Listener Interfaces, Adapter classes	**02**
10.	**Java Database Programming** Introduction, JDBC Drivers, Steps to connect to the database, DriverManager class, Connection interface, Statement interface, ResultSet interface, PreparedStatement Interface, CallableStatement, Connectivity with MySQL using JDBC, Connectivity with Access without DSN	**03**
	Total	**14**

Instructional Method and Pedagogy:

- Lectures will be conducted in the audio-visual classroom to discuss important concepts with the help of animations/videos / PPTs/case studies to understand the concepts effectively.
- Problems based on concepts learned in each unit/topic will be given followed by a discussion to improve problem-solving skills.
- Existing Application that used OOP concepts will be demonstrated to understand the use of concepts in real life application.
- The team project will be given such that students can apply their OOP skills.

Reference Books:

- Title: “The Complete Reference of Java 2”, Fifth Edition, TMH
  Author: Herbert Schild
- Title: “JAVA Programming”, Pearson Education Publishers
  Author: Hari Mohan Pande
- Title: “Core Java Volume - I & II”, Eight Edition, Pearson Education Publishers
  Authors: Horstmann & Cornell
- Title: “Beginning Java 2”, Fifth Edition, Wrox Publication
  Author: Ivor Horton
- Title: “Programming in Java” Second Edition, TMH Publication
  Author: E. Balagurusamy
- Title: “Learning JAVA”, First Edition, BPB Publication
  Author: David Herst

Additional Resources

- www.Java2s.com
- www.roseindia.net
- www.javabeginner.com
- docs.oracle.com/javase/tutorial/
- www.javatutorialhub.com/
- Spoken-tutorials.org
- www.javatpoint.com
- http://www.ntu.edu.sg/home/ehchua/programming/java/jdbc_basic.html
- http://cs-fundamentals.com/java-programming/java-jdbc-connection-tutorial.php

RKUNIVERSITY	SYLLABUS

Course Title	**Enterprise Computing Through .NET Frameworks**
Course Code	**MCAL234**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

At end of the course, students will be able to:

- **Understand** the basic concepts of C# and Windows programming, importance CLR and .NET framework
- **Develop** clear and effective C# code for the given problem
- **Use** the trace and debug utilities that are provided with Visual Studio .NET
- **Apply** Microsoft ADO.NET and inbuilt data tools functionalities for accessing data in windows application
- **Develop**, **configure,** and **deploy** windows application

Detailed Syllabus

Sr. No.	Name of chapter and details	Hours Allotted
	SECTION-I	
1	**Introduction** The .NET Framework - an Overview, .NET Framework Architecture, Features, Overview of different types of application development using MS.NET, .NET Framework Components	2
2	**Language Basics and Console Application Development** Introduction to Project and Exploring the IDE of VS.NET, Introduction to C# .Net language, main() Method, Libraries with Namespaces - 'using' Keyword, Console Application Development, Compiling and Executing using command line and IDE,	6

	Data Types, Operators, Decisions making & Loop Control Structures, working with different types of Arrays, working with methods - pass by value and pass by reference, out parameters, Command Line Arguments Basics of Classes and Objects, Access specifiers, Inheritance, Polymorphism, get and set properties, String Operations Keywords – static, this, base, new, abstract, sealed	
3	**Advanced Concepts of C#** Interface, Delegates and Events, Indexers, Lambda Expressions, Regular Expressions, Implementing Exception Handling, Multithreading, Generics, Using Built in Generic and Non-Generic Collection classes	6
	Total	**14**
	SECTION-II	
4	**Windows Programming** Introduction, SDI and MDI Applications, Working with MDI and Child Forms, Controls - General Controls, Container Controls, Menu and ToolBars, Dialogs, Application Setup and Deployment	3
5	**Data Access using ADO.NET** Evolution of ADO.NET, ADO .NET Architecture, ADO.NET Connected and Disconnected Models, working with database using DataReader, DataSet, DataAdapter, DataTable, DataColumn, DataRow, DataRelation, and DataView	4
6	**Working with WPF** Introduction to WPF, XAML, Routed Events, Logical and Visual Tree, Development Workflow of a WPF Project, Built-in Controls of WPF, User and Custom Controls, Layouts, Implementing Styles and Templates, Data Binding with WPF Controls	5
7	**Report and Windows Services** Introduction, Types of report, Report Fields, Implementation of Reports in Application Windows Services: Purpose, Advantages, Developing, Deploying Debugging, and Sending Custom events	2
	Total	**14**

Instructional Method and Pedagogy:

- Lectures will be conducted based on Classroom Response Systems with the use of multimedia projector and black board.

- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular intervals.
- Experiments will be based on the practical curriculum and will be evaluated at regular intervals.
- Students will be guided to develop real-world applications with the advanced concepts of application development.

Reference Books:

1. E Balagurusamy, Programming in C#, Tata McGraw-Hill

2. Kogent Learning Solutions Inc., Visual Studio .Net Programming Black Book, Dreamtech press

3. Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, Professional C#, Wrox Publication

Additional Resources

- msdn.microsoft.com
- www.completecsharptutorial.com
- www.codeproject.com
- www.stackoverflow.com
- www.dotnetspider.com
- www.tutorialspoint.com
- www.w3schools.com
- www.c-sharpcorner.com
- https://www.tutorialspoint.com/wpf/index.htm
- https://www.wpftutorial.net/Home.html
- http://www.wpf-tutorial.com/

RKUNIVERSITY	SYLLABUS

Course Title	**Data Science with Python**
Course Code	**MCL3110**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :3

Course Learning Outcomes:

At end of the course, students will be able to:

- **Recognize** various data structures and apply them in solving computational problems.
- **Apply** core python and object-oriented python concepts to build real world applications.
- **Interpret** data using NumPy and Pandas library.
- **Query** and **Analyze** large data set to extract relevant information in graphical format.
- **Retrieve** data from websites and APIs using Python.
- **Demonstrate** substantial knowledge with the Python program development environment.

Detailed Syllabus

Sr. No.	Name of chapter and details	Hours Allotted
	SECTION-I	
1	**Basics of Data Science and Python** Introduction to Data Science, Data Science Life Cycle, Reasons for Data Science with Python, Current Trends for Data Science, Role of Data Scientist, History and need of Python, Applications of Python, Advantages and Disadvantages of Python, Installing Python, Program structure, User Interface or IDE	2
2	**Python Fundamentals** Working with Script mode, Python Character Set, Tokens, Keywords, Identifiers, Literals, Operators, Variables and Assignments, Input and Output in Python, Data Types – Numbers, Strings, Lists, Tuples, Dictionary, Set, Mutable and Immutable	4

3	**Program Flow Control and Iterations** Conditional Statements - The if, if-else, if-elif, Nested if, Python Indentation Looping and Iteration - The For Loop, The While Loop, Loop else Statement, Nested Loops, Break and Continue	3
4	**Python Functions, Modules and Packages** Built-In Functions, Structure of Python Functions, range function and its types, User Defined Functions, Arguments and Parameters, Default Arguments, Named Argument, Lambda function in python, Scope of Variables Modules and packages - Importing Modules in Python Programs, Working with Random Modules	3
5	**File Operations and Exception Handling** File Operations – Opening a file, Reading and Writing Text Files Exception Handling - Default Exception and Errors, Catching Exceptions, Raise an exception, Try.... except statement, Raise, Assert, Finally blocks	2
	Total	**14**
	SECTION-II	
6	**Classes and Objects** Creating Classes and Objects, Instance Variables, Access Specifiers, Importance of self, __init()__Method, Instance Method, Class Method, Static Method, Inheritance, Polymorphism	2
7	**Regular Expression and Database Integration** Regular Expressions, Match function, Search function, Matching vs Searching, Wildcard Install and configure Database Packages, Create database connection, CRUD operations, Handling Database Errors	3
8	**Data Analytics and Visualization** NumPy Library – Introduction and Installation of NumPy, NumPy Arrays, Array creation using built-in functions, Attributes and Methods, Array manipulation, Indexing and Iterating Pandas Library – Introduction to Pandas, Pandas Series, Data Frame, Importing and Exporting data with Excel files, Manipulating a Data Frame Visualization – Introduction to Matplotlib, Types of Charts, Legends, annotations and style, Plotting directly from Pandas Data Frame and NumPy Arrays	5

9	**Web Scraping** Introduction to Web Scrapping, Use of Web Scrapping, Retrieving Web Pages, Parsing Web Pages, Beautifulsoup Package, Tweet Scrub, Amazon Screen Scrapper, Mailmerge	4
	Total	**14**

Instructional Method and Pedagogy:

- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Exercise will be based on the practical curriculum and will be evaluated at regular interval.

Reference Books:

- Title: “Introduction to Computing and Problem Solving with Python”
  Author(s): Jeeva Jose and P. Sojan Lal
- Title: “Python: The Complete Reference”
  Author(s): Martin C. Brown
- Title: “Learning Python
  Author(s): Mark Lutz
- Title: “Python for Data Analysis”
- Author(s): Wes McKinney

Additional Resources

- https://docs.python.org
- https://www.w3schools.com/python/
- https://www.programiz.com/python-programming/tutorial
- http://www.numpy.org/
- http://pandas.pydata.org/

RKUNIVERSITY

SYLLABUS

Course Title	**Internet Programming**
Course Code	**MCAL132**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Acquire** knowledge about functionalities of World Wide Web
- **Explore** markup languages features and create interactive web pages using them
- **Learn** and **design** client-side validation using scripting languages
- **Implement** AJAX to enhance web applications experience
- **Implement** object-oriented Server-side code
- **Configure** and deploy Web Application

Detailed Syllabus

Sr. No.	Name of chapter and details	Hours Allotted
	SECTION-I	
1.	**Introduction** Introduction to WWW, WWW Architecture, URL, SMTP, POP3, FTP, Overview of HTTP, HTTP Request and Response, Static and Dynamic Web Pages	**02**
2.	**UI Design** HTML5: Introduction, Features of HTML5 – Semantic Tags – New Input Elements and Tags - Media tags (Audio and Video tags) – Designing Graphics using Canvas API - Drag and Drop Features – Geolocation API. CSS/CSS3: Introduction to Style Sheet, Types, Concept of Class and ID, Different CSS Properties, Features of CSS3 – Implementation of Border Radius, Box Shadow, Image Border, Custom Web Font, Backgrounds, 2D and 3D Transformations - Transitions to elements - Animations to Text and Elements	**05**

3.	**Responsive Web Design (RWD)** Responsive Design: What is RWD – Introduction to RWD Techniques – Fluid Layout, Fluid Images and Media queries - Introduction to RWD Framework Twitter Bootstrap – Bootstrap Background and Features - Getting Started with Bootstrap - Demystifying Grids – Bootstrap Components - JS Plugins - Customization	**03**
4	**Client-Side Scripting Language** Introduction - Core Features - Data Types and Variables - Operators, Expressions and Statements - Functions and Scope - Objects - Array, Date and Math related Objects - Document Object Model - Event Handling –Form Handling and Validations. jQuery: Introduction – jQuery Selectors – jQuery HTML - Animations – Effects – Event Handling – DOM – jQuery DOM Traversing, DOM Manipulation – jQuery AJAX	**04**
	Total	**14**
	SECTION-II	
5.	**Server-Side Scripting Language** PHP - Introduction, Syntax, Whitespace, Comments, Operators, Conditional and Looping Statements, User Define Function, Arrays. GET and POST Methods Built-In Functions: String, Math, Date, Array, File Handling, Miscellaneous Function, Sending Email using PHP, Uploading a File	**07**
6.	**PHP Components** GD Library, Cookies, Session, Server Variable, Database connectivity with MySQL, Regular Expression	**04**
7.	**Advance Concept** Object Oriented Techniques in PHP: Class, Object, Constructor, Inheritance, Interface. AJAX: Introduction, Implementation, Working of AJAX with MySQL Database	**03**
	Total	**14**

Instructional Method and Pedagogy:

- Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Experiments will be based on the practical curriculum and will be evaluated at regular interval.
- End Semester exam (TSEE) will be conducted of 50 Marks.

Reference Books:

- Title: “Developing Web Application”, Wiley India Publication
  Author(s): Ralph Moseley, Wiley India
- Title: “Beginning PHP5, Apache, Mysql Web Development”, Wrox
  Author(s): Elizabeth Naramore, Michael K. Glass
- Title: “PHP Bible”, Wiley Publication
  Author(s): Tim Converse, Joyce Park
- Title: “Web Enabled Commercial Application Development Using HTML, DHTML, PERL, Java Script”, BPB Publications
  Author(s): Ivan Bayross
- Title: “Beginning AJAX”, Wrox
  Author(s): Chris Ullman, Lucinda Dykes
- Title: “Beginning JavaScript” 2nd Edition, Wrox
  Author(s): Nicholas C. Zakas

Additional Resources

- http://w3schools.com
- http://tutorialspoint.com
- Web link for Responsive Web Design - https://bradfrost.github.io/this-is-responsive
- Ebook link for JavaScript
  https://github.com/jasonzhuang/tech_books/tree/master/js
- https://www.codeofaninja.com
- http://php.net/manual/en/resource.php
- http://www.phpjunkyard.com/resources/index.php
- http://www.script-tutorials.com/category/php
- http://php.resourceindex.com

RKUNIVERSITY	SYLLABUS

Course Title	**Relational Database Management System**
Course Code	**MCAL113**
Course Credits	Theory :3
	Practical :1
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Design** a relational database schema based on an organization's requirement
- **Design** entity-relationship diagrams to represent database application scenarios
- **Decompose** relation with anomalies to design smaller and well-structured relation
- **Describe** the knowledge of transaction processing and deadlock resolution
- **Apply** knowledge of SQL queries to perform various database related operations
- **Develop**, **execute** and **manage** PL\SQL program blocks

Detailed Syllabus

Sr. No.	Name of chapter and details	Hours Allotted
	SECTION-I	
1.	**Database Concepts** Basic Concepts: Data, Database, Database Systems, Database Management System, Instance, Schema,Purpose of Database System, Database Applications, Advantages and Disadvantages of DBMS Over File Systems,Data Storage and Querying: Components, Storage Manager, Query Processor,Three Level Architecture, Database User and Administrators,Data Models: Introduction, Types of Data Models (ER, Relational, Hierarchical, Network and Object Oriented)	**05**
2.	**Relational Model** Structure of Relational Database: Basic Structure, Database Schema, Keys: Super key, Candidate key, Primary key, Foreign key, E-R Model: Entities, Types of Entities, Relationship and Types of Relationships, Attributes, Types of Attributes,Constraints: Mapping Cardinalities, Keys, Participation Constraints,E-R Notations, E-R Diagram,Extended E-R Features: Generalization, Specialization and Aggregation Fundamental Relational Algebra Operations: Selection,	**06**

	Projection, Union, Set - Difference, Intersection, Cartesian Product, Natural Join and Rename	
3.	**Database Design and Data Dictionary** Database Design: Features of Good Relational Design, Anomalies in a Database, Functional Dependencies: Closure set of FD, Closure of Attribute Set, Canonical Cover, Lossless decomposition, Dependency preservance, Stages of Normalization: Introduction, Normal Forms, 1NF, 2NF, 3NF, BCNF, Multivalued Dependency: 4NF and 5NF, Translation of E-R schemes (logical design) to Relational Schemes (Physical design): A case study, Data Dictionary: Introduction to Data Dictionary, Data Dictionary Storage	**06**
4.	**Transaction Processing and Concurrency Control** Introduction to Transaction Concepts, Transaction Execution and Problems, Transaction States, ACID Properties, Transaction Logs, Locking Methods for Concurrency Control, Timestamp Methods for Concurrency Control, Optimistic Methods for Concurrency Control: Read Phase, Validation Phase, Write Phase, Deadlock handling: Detection and Resolution	**04**
	Total	**21**
	SECTION-II	
5.	**Structured Query Language** SQL Statements-DDL, DML and DCL, Fundamentals of Tables: Data Types, Constraints, Creating Database, Table, Inserting Data, Alter Command, Select Command, Sorting Data, Creating a Table From a Table, Inserting Data into a Table From Another Table, Update Command, Delete Command, Drop Command, Truncate Command, Rename Command, Computations on Data: Types of Operators, Aggregate Functions, Single Row Functions, Group By Clause, Having Clause, Sub Queries, Joins, Set Operators	**10**
6.	**Advance SQL** Multitable Insert, Using WITH Clause and its Advantages, MERGE Statement, Index, Views and Sequences, Controlling User Access Transaction Commands: Commit, Rollback, Savepoint	**04**
7.	**PL/SQL** Introduction, Advantages of PL/SQL, PL/SQL Block Structure, Data Types, Control Structure, Cursor, Types of Cursor, Error Handling, Procedure and Functions, Package, Trigger, Types of Triggers	**07**
	Total	**21**

Instructional Method and Pedagogy:

- Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Experiments will be based on the practical curriculum and will be evaluated at regular interval.

Reference Books:

- Title: Database System Concepts, 5th Edition, Tata McGraw-Hill
  Author(s): Silberschatz, Korth, Sudarshan
- Title: Database Systems, Concepts, Design and Applications, Pearson Education
  Author(s): S.K. Singh
- Title: SQL, PL/SQL – The programming Language Oracle, BPB Publication
  Author(s): Ivan Bayross
- Title: Database Management Systems, Third Edition, Tata McGraw Hill
  Author(s): Ramakrishnan, Gehrke
- Title: Fundamentals of Database Systems, Fifth Edition, Pearson Education
  Author(s): Navathe
- Title: An Introduction to Database Systems, Eighth Edition, Pearson Education
  Author(s): C.J.Date, a Kannan, S Swaminathan

Additional Resources

- http://www.w3schools.com/sql
- http://www.roseindia.net
- http://docs.oracle.com/dbms/tutorial
- http://Spoken-tutorials.org
- http://tutorialspoint.com/sql

RKUNIVERSITY	SYLLABUS

Course Title	**Project - I**
Course Code	**MCAL227**
Course Credits	Theory : 0
	Practical : 2
	Tutorial : 0
	Credits : 5

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Explore** depth knowledge of Technologies and Project Development Process
- **Solve** enterprise problem with their knowledge
- **Understand** the importance of project development deadlines and how to meet them
- **Work** in team collaboratively
- **Deploy** application for real use

Detailed Syllabus

The students will select a project definition. They will work in a group with maximum of two members. The project should involve use of knowledge of development tools. At the end of semester, they will submit completely running project.

Instructional Method and Pedagogy:

- Instructor will help the students in selecting the project definition.
- Continuously monitoring of student's project progress during the semester.
- Students will present their work in regular time interval during the semester.
- Instructor will help the students during project development life cycle of their project..

RKUNIVERSITY

SYLLABUS

Course Title	**Web Application Development using ASP.NET**
Course Code	**MCAL332**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Understand** the Microsoft .NET Framework and ASP.NET page structure
- **Design** web application with variety of controls
- **Utilize** Microsoft ADO.NET to access data in web Application
- **Develop** an MVC based web application
- **Configure** and **deploy** secure Web Application

Detailed Syllabus

Sr. No.	Name of chapter and details	Hours Allotted
	SECTION-I	
1.	**Web Programming Concepts** Understanding of Web Server and Web Browser, Brief about HTTP Protocol, HTTP Request and Response Structure, IIS Web Server Configuration **Introduction to ASP.NET** ASP.NET and .NET Framework, Common Language Runtime, Framework Class Library	**02**
2.	**Designing Web Application** The Structure of ASP.NET Page, Creating and Running Application, AutoPostBack concept, Controls – Standard Controls, HTML Controls, Navigation Controls, Rich Controls, Login Controls, Validation Controls, Web User Control	**06**
3.	**Designing using Master Page and Themes** Introduction, Need of Master Pages, Significance of ContentPlaceHolder Tag and Content Tag, Designing and Accessing Master Pages, Introduction to Theme, Creating Theme, Applying Theme, Applying Stylesheet	**03**

4.	**State Management and Configuration** Introduction, State Management Techniques: Client Side and Server Side Configuration Overview, Importance of WEB.CONFIG, Common Configuration Settings, Connecting Strings, Authentication, Authorization, Managing Application Settings, Handling Errors / Custom Errors, ConfigSource attribute	**03**
	Total	**14**
	SECTION-II	
5.	**Performing Data Access in ASP.NET** Overview and Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object, Model, Connection Class, Command Class, DataAdapter Class, Dataset Class, DataReader Class Working with LINQ Display Data on Web page using Data Bound Controls, Data Binding with Standard Web Server Controls	**05**
6.	**Advanced Concepts** Architecture of AJAX.NET, Using AJAX.NET Controls Basics of Web services, Creating Web Service, Consume and Deployment of a Web Service	**02**
7.	**Introduction to ASP.NET Core** Introduction, ASP.NET Vs. ASP.NET Core, Project Structure, Configuration with Startup.cs file, MVC Design Pattern	**02**
8.	**Building and Deploying an ASP.NET Core Application** Introduction and Implementation of Views, Controllers, Models Applying Client and Server-side Validations, Routing Working with Data in ASP.NET Core, Deployment	**05**
	Total	**14**

Instructional Method and Pedagogy:

- Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Experiments will be based on the practical curriculum and will be evaluated at regular interval.

Reference Books:

- Title : ASP.NET Unleashed, Sams publication
  Author(s) : Stephen Walther, Kevin Hoffman, Nate Dudek
- Title : Professional ASP .NET 4.0, Wrox
  Author(s) : Alex Homer, Dave Sussman, Rob Howard
- Title : Learning ASP.NET Core MVC Programming, Packt Publishing
  Author(s) : Mugilan T. S. Ragupathi

Additional Resources

- www.dotnetspider.com
- www.stackoverflow.com
- https://docs.microsoft.com/en-us/aspnet/core/
- https://www.tutorialspoint.com/asp.net_core/index.htm
- www.tutorialspoint.com/asp.net/index.htm
- www.codeproject.com
- msdn.microsoft.com
- www.w3schools.com/aspnet/

RKUNIVERSITY	SYLLABUS

Course Title	**Android Application Development**
Course Code	**MCAL353**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Acquire** an insight into concepts of mobile application development terminologies, environment and architecture
- **Design** mobile application using various UI components and layouts.
- **Develop** robust mobile applications with database interaction and web service integration
- **Deploy** application on mobile device

Detailed Syllabus

Sr. No.	Name of chapter and details	Hours Allotted
	SECTION-I	
1.	**Android Operating System and Development Environment** Introduction, Android Architecture, Versions, Features, OHA, Dalvik VM, Android SDK, Android Development Tools, Android Virtual Devices, Development Environment, Directory Structure of Android Application, AndroidManifest file	**02**
2.	**Android Components and Resource Handling** **Components:** Context, Activity, Intent, Service, Broadcast Receiver **Resources:** String, Color, Drawable, Styles, Theme **Localization:** Prepare Application for Localization	**03**
3.	**Android User Interface Elements** Introduction of Material Design, UI and UX **Layouts:** Linear Layout, Absolute Layout, Frame Layout, Relative Layout, Constraint Layout, Dynamic Implementation of Layout UI widgets with Properties, Events and Methods, Dialog Boxes **Menus:** Option and Context	**06**

4.	**Working with Views and Fragment** **Views:** GridView, WebView, ScrollView, ListView, RecyclerView, CardView **Fragment:** Introduction, life Cycle, Implementation	**03**
	Total	**14**
	SECTION-II	
5.	**Data Storage Techniques** Shared Preferences, Files and Directories, SQLite Database Connectivity and Operations, Content Providers: Basics, Content URI, Content Resolver, Built-in content providers.	**05**
6.	**Web Application Integration Techniques** Introduction of AsyncTask, Communication with Web API, Introduction to JSON data, JSON Parsing, Implementation of Third-Party Library to Fetch Network Data, Notifications, Telephony API, Google API	**05**
8.	**Polish and Publish Application** Different Ways to Monetize, Versioning, Signing, Packaging and Beta Test of Mobile Application, Distributing Application on Mobile Market Place	**04**
	Total	**14**

Instructional Method and Pedagogy:

- Lectures will be conducted based on Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Tutorials will be based on the practical curriculum and will be evaluated at regular interval.

Reference Books:

- Title: “Android Wireless Application Development”, 2nd Edition, Pearson Education
  Author(s): Lauren Darcey, Shane Conder
- Title: “Head First Android Development: A Brain Friendly Guide”, O`Reilly
  Author(s): David Griffiths and Dawn Griffiths
- Title: “Professional Android 4 Application Development”, John Wiley and Sons
  Author(s): Reto Meier
- Title: “Beginning Android”, Apress
  Author(s): Mark L Murphy

Additional Resources

- http://www.vogella.com/articles/Android/
- https://developer.android.com
- http://androinica.com/category/androidguide
- http://www.androidhive.info
- http://www.learn-android-easily.com
- http://www.javatpoint.com/android-tutorial

RKUNIVERSITY

SYLLABUS

Course Title	**Advanced Java**
Course Code	**MCAL331**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Understand** advance java concepts.
- **Develop, deploy and manage** dynamic and secure web applications using Servlet, JSP, Struts, Spring, and Hibernate.
- **Develop** distributed application using RMI.
- **Apply** appropriate design pattern for real world problems
- **Perform** unit testing to validate developed application

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	SECTION-I	
1.	**Introduction to J2EE** J2EE architecture, Enterprise application concepts, n-tier application concepts, J2EE platform, HTTP protocol, web application, Web containers and Application servers.	**02**
2.	**Introduction to RMI** RMI architecture, RMI registry, Implementation of distributed application with RMI, Naming services, Naming and Directory Services, Overview of JNDI, Object serialization and Internationalization.	**04**
3.	**Design Pattern** Introduction, Singleton, DAO - Data access object, DTO - Data transfer objects, MVC, Front Controller, Factory Method	**02**
4.	**Maven** Introduction, Requirement, Ant Vs Maven, Maven Repository, understanding pom.xml, Working with Maven.	**02**
5.	**Servlet**	**04**

	Introduction, Features, Skeleton of Servlet, Structure of Servlet, ServletConfig and ServletContext Objects, Servlet Request: HttpServletRequest, Handling Form Data, Reading Form Data, Reading Request Headers, Status Code, Servlet Response: HttpServletResponse, Response Headers, Response Redirections, Auto Refresh / Wait Pages, Servlet implementation using JDBC, Session Tracking, Security Issues, Introduction to filters with writing simple filter application. Securing Web Application, authentication, authorization, using deployment description	
	Total	**14**
SECTION-II		
6.	**JSP** Introduction, The Problem with Servlet. The Structure of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment, Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression, to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging, Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations, Tag Library – Basics, Using JSTL – c:out, c:forEach, c:forTokens, c:if, c:choose, c:set, c:remove, c:import, c:url, c:param, c:redirect and c:catch Tags	**05**
7.	**Hibernate** Introduction, Mapping Techniques, Retrieving Objects Efficiently, Transactions and Concurrency, Hibernate Caching, Designing Hibernate based Applications	**02**
8.	**Struts2 Framework** Introduction, Basics of Struts, Model 1 v/s. Model 2 Architecture, Struts-2 Features, Steps to create Struts-2 Application, Structs-2 Action, Struts-2 Validation	**02**
9.	**Spring Framework** Introduction, Basics of Springs, Spring Modules, Steps to create Spring Application, IOC Container, Dependency Injection.	**02**
10.	**Junit** Introduction, Requirement, Types of Testing, Annotations used in Junit, Assert class, Test Cases	**03**
	Total	**14**

Instructional method and Pedagogy:

- Conduction of the lecture will include effective use of multimedia projector.
- During the lecture, topic will be covered by doing the programming on the spot.
- After completion of each unit, the assignment will be provided which will be evaluated on time.
- Tutorials will be provided periodically for each modeling that must be practiced during the lab lesions under continues monitoring.
- Active learning methodologies will be introduced like problem-based, quiz etc, according to the topic requirement.

Reference Books:

- Title: Java Server Programming, Java EE6, Black Book, Dreamtech Press, Edition 2010 Author(s): Kogent Learning Solutions Inc.
- Title: The Complete Reference J2EE 5th Edition, Tata McGraw-Hill Edition Author(s): Jim Keogh
- Title: Core Servlets and Java Server Pages Volume - 1, 2nd edition, Pearson Education Author(s): Marty Hall, Larry Brown
- Title: Core Servlets and Java Server Pages Volume - 2, 2nd edition, Pearson Education Author(s): Marty Hall, Larry Brown, Yaakov Chaikin
- Title: Professional Java Server Programming, J2EE 1.3 Edition, Apress publications Authors: Subrahmanyam Allamaraju, Cedric Buest

Additional Resources

- http://java.sun.com/docs/books/jls/download/langspec-3.0.pdf
- http://java.sun.com/docs/books/tutorial/index.html
- www.Java2s.com
- www.roseindia.net
- http://docs.oracle.com/javase/tutorial/
- www.javatutorialhub.com/
- http://www.tutorialspoint.com/hibernate/hibernate_architecture.htm
- http://www.tutorialspoint.com/struts_2/
- http://java2all.com
- http://www.oodesign.com/
- https://github.com/iluwatar/java-design-patterns

RKUNIVERSITY	SYLLABUS

Course Title	**iOS Application Development**
Course Code	**MCL2021**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Demonstrate** various terminologies related to Swift and iOS programming.
- **Use** basic iOS programming concepts in real life applications.
- **Design & deploy** native iOS app.
- **Examine** various functionality into properly designed components.
- **Demonstrate** iOS application deployment on apple app store.
- **Examine** and subdivide app functionality into properly designed components.

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	SECTION-I	
1.	**Introduction to iOS Application and Environment:** iOS Architecture and SDK framework, iOS and SDK Version Compatibility, iOS application life cycle (MVC), XCode: Tour of IDE, Templates, Projects and workspace, Simulators, Asset Management, Swift Playground, Connecting the UI to code, Build and Run	**03**
2.	**Basics of Swift Programming** Introduction, Swift vs. Objective C, Swift Playground, File Structure, Data types, Variables, Constants, Flow Control Statements: Loops, If and Switch statements.	**04**
3.	**Functions, Arrays, Dictionaries and Sets** Swift Functions, Swift Arrays, Swift Dictionaries, Swift Sets	**03**
4.	**Tuples, Optionals, Enumerations and Closures** Tuples, Optionals, Enumerations, Closures, Getters and Setters - A Property Observer	**02**

5.	**Classes and Structures - The Heart of Swift** Introduction to Classes in Swift, Classes - Access Levels and Computed Properties, Subclasses, Structures - Not Just a Simple Container	**02**
	Total	**14**
	SECTION-II	
6.	**User Interface and Application Development** Single View Application Development, User Interface Design Controls with Properties and Actions, Understanding Outlets And Actions, , Deployment of Application	**03**
7.	**Storyboard Based Application** Introduction to Storyboard, Adding Scenes, Segues, Transition, auto layout, intro to adaptive layout	**03**
8.	**Master-detail view application** Table Views: Static and Dynamic Table Views,Delegates and Data Sources, Table View Styles, Custom Cells Collection View: Custom Cell, Collection View Style, Delegates and Data sources AVKit : Audio Player, Video Player Map View : Designing and implementation of Map View using Apple Map Navigation Based Applications: Root View Controller, Creating the Navigation Controller, Controlling the Stack Navigation Programmatically	**06**
9.	**Working with Data** Overview of Core Data, SQLite Integration, Retrieving and Modifying Data, Sending HTTP GET and POST Requests, Parsing JSON, Parsing XML	**02**
	Total	**14**

Instructional Method and Pedagogy:

- Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Experiments will be based on the practical curriculum and will be evaluated at regular interval.
- Students will be guided to develop the real-world applications with the advanced concepts of application development.

Reference Books:

- Title: "iOS 10 Programming Fundamentals with Swift"

Author(s) : Matt Neuburg

- Title: " Swift for Beginner: Develop and Design" Author(s) :Boisy G. Pitre
- Title : Building iPhone and iPad Electronic Projects - MikeWesterfield - O'Reilly Media Pub.

Title : Head First iPhone and iPad Development, 2nd Edition - Dan Pilone, Tracey Pilone

Additional Resources

- https://developer.apple.com/
- https://swift.sandbox.bluemix.net/
- https://iswift.org/cookbook
- http://www.tutorialspoint.com/ios/
- https://www.lynda.com/Swift-tutorials/Swift-3-Essential-Training-Basics/
- https://itunes.apple.com/gb/book/swift-programming-language/id881256329?mt=11
- https://code.tutsplus.com/categories/mobile-development

RKUNIVERSITY

SYLLABUS

Course Title	**Cyber Security**
Course Code	**MCL2013**
Course Credits	Theory :3
	Practical :1
	Tutorial :0
	Credits :4

Course Learning Outcomes:

At end of the course, students will be able to:

- **Explain** the features and characteristics of the Linux Operating System and Windows Operating System.
- **Apply** network monitoring tools to identify attacks against network protocols and services.
- **Apply** various methods to prevent malicious access to computer networks, hosts, and data.
- **Explain** how to investigate endpoint vulnerabilities and attacks.
- **Analyze** network intrusion data to verify potential exploits.
- **Apply** incident response models to manage network security incidents.

Detailed Syllabus

Sr. No.	Name of chapter and details	Hours Allotted
	SECTION-I	
1.	**Introduction to Cyber Security Operation** Basics of Cyber security and the Security operations center, threats, cyber crime	**03**
2.	**Operating System** Windows overview and administration, Linux overview and administration	**06**
3	**Network Protocols and Services** Network protocols, Ethernet, and Internet Protocol (IP), Connectivity verification, Address Resolution Protocol, The Transport layer, and Network services	**05**
4	**Principles of Network Security** Attackers and their tools, Attacking the foundation, TCP/IP vulnerabilities	**04**
5	**Protecting the Network** Understanding defense, Access Control, Network firewalls and Intrusion prevention, Content filtering, Threat intelligence	**03**

	Total	**21**
	SECTION-II	
6.	**Cryptography and the Public Key Infrastructure** Cryptography, Public Key Cryptography, Tools to encrypt and decrypt data	**04**
7.	**Endpoint Security and Analysis** Endpoint protection, Tool to generate a malware analysis report, Endpoint vulnerability assessment,	**05**
8.	**Security Monitoring** Security technologies, Monitoring, Types of log files used in security monitoring	**03**
9.	**Intrusion Data Analysis** Data collection, Data preparation, Data analysis	**04**
10.	**Incident Response and Handling** Incident Response Models, CSIRTs and NIST 800-61r2 standard, Case-Based Practice	**05**
	Total	**21**

Instructional Method and Pedagogy:

- Lectures will be conducted based on Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Experiments will be based on the practical curriculum and will be evaluated at regular interval.

Reference Books:

- CCNA Cyber Ops SECFND 210-250 Official Cert Guide, CISCO press
- Cybersecurity : the beginner's guide : a comprehensive guide to getting started in cybersecurity, by Erdal Ozkaya, Birmingham
- Cybersecurity for Dummies, by Joseph Steinberg

Additional Resources

- www.netacad.com (Through CISCO login ID and Password)

RKUNIVERSITY	SYLLABUS

Course Title	**Advanced User Interface Technologies**
Course Code	**MCL2012**
Course Credits	Theory :2
	Practical :2
	Tutorial :0
	Credits :4

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Implement** NoSQL Database CURD operations
- **Acquire** knowledge about Server-side JS framework to make Database Connectivity
- **Acquire** knowledge about functionalities of Client-side and Server-side JS frameworks
- **Explore** Angular features and **create** component-based web pages using them
- **Design** Front-end web pages and **connect** to the Back-end Databases.

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	SECTION-I	
1.	**Twitter Bootstrap**: Getting Started with Bootstrap, Demystifying Grids, Off Canvas, Bootstrap Components, JS Plugins - Customization	02
2.	**Introduction to NoSQL Database - MongoDB** Introduction to NoSQL Database, Importance of MongoDB, CAP/Brewer's Theorem, BASE approach, Comparison of MongoDB with RDBMS, Installations, Configuration and Structure of MongoDB, Terminologies in MongoDB, Implementation of Basic CRUD Operations, Aggregate Functions, Groups and Accumulator Operators	06
3.	**Introduction to Server-side JS Framework – Node.js** Introduction to Node JS, Architecture, Features, Installation and Setup. Creating Web Servers with HTTP (Request & Response), Event Handling,	06

	GET & POST Implementation, Modules, connect to NoSQL Database using Node JS, Implementation of CRUD Operations	
	Total	**14**

	SECTION-II	
4.	**Introduction to TypeScript** Introduction to TypeScript, Features of TypeScript, Installation setup, Variables, Datatypes, Enum, Array, Tuples, Functions, OOP concepts, Interfaces, Generics, Modules, Decorators, Compiler Options, Project Configuration	**05**
5.	**Introduction to Client-side JS Framework – Basics of Angular** Introduction to Angular, Needs & Evolution, Features, Setup and Configuration, Components and Modules, Templates, Data Binding, Directives, Pipes, Nested Components	**05**
6.	**Introduction to Client-side JS Framework – Forms and Routing in Angular** Template Driven Forms, Model Driven Forms or Reactive Forms, Custom Validators, Dependency Injection, Services, RxJS Observables, HTTP, Routing	**04**
	Total	**14**

Instructional Method and Pedagogy:

- Lectures will be conducted based on Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Experiments will be based on the practical curriculum and will be evaluated at regular interval.

Reference Books:

- Title : Mastering TypeScript
  Author(s) : Nathan Rozentals
- Title : ng-book, The Complete Book on Angular 4
  Author(s) : 2. Nate Murray, Felipe Coury, Ari Lerner and Carlos Taborda
- Title : MongoDB Cookbook Paperback

Author(s) : Amol Nayak

- Title : Node.js by Example Paperback
  Author(s) : Krasimir Tsonev

Additional Resources

- Web link for TypeScript: https://www.typescriptlang.org
- Web link for Angular4.0: https://angular.io
- Web link for Node.js: https://nodejs.org/en/
- Web link for MongoDB: https://www.mongodb.com

RKUNIVERSITY	SYLLABUS

Course Title	**Project - II**	
Course Code	**MCAL325**	
Course Credits	Theory	:0
	Practical	:2
	Tutorial	:0
	Credits	:5

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Acquire** the knowledge of SDLC
- **Understand** the database concepts, different database models, and database management system
- **Design** and **manipulate** a forms in required development tool.
- **Create and Deploy** their own system
- **Evaluate the** performance of the created or existing system

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	Content	
1	Student will select a topic for project work in consultation with the guiding teacher and/or expert from industries. The student will have to do literature survey & experimental work on that topic. At the end of the semester he/she will have to submit a report on his/her works. The student will present his/her topic in front of experts and staff. His/her performance will be assessed on the basis of his/her project report and presentation.	--
	Total	--

Additional Resources

- http://www.nptel.ac.in