



B.Sc. (I.T.) SEM 6			
SR. NO	SUBJECT	NO. OF THEORY LECT. PER WEEK	NO. OF PRACTICAL PER WEEK
1	CS – 31: Mobile Application Development in Android using Kotlin	5	6
2	CS – 32: Programming with ASP.NET	5	6
3	CS – 33: Machine Learning with Python	5	6
4	CS – 34: Practical – 1 (Based on CS-31)	-	6
5	CS – 35: Practical – 2 (Based on CS-32 and CS-33)	-	6
6	CS – 36: PROJECT VIVA	-	6



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Saurashtra University
To be effective from June – 2024

CS-31: Mobile Application Development in Android using Kotlin		
Objectives: <ul style="list-style-type: none"> • Understanding Android Development. • Familiarize students with the Kotlin Programming Language • Gain necessary knowledge and skills to develop high-quality Android applications using Kotlin. Prerequisites: <ul style="list-style-type: none"> • Basic Programming Knowledge • Basic Understanding of Java and XML • Knowledge of OOP Concepts 		
Unit No.	Topic	Detail
1	Introduction to Kotlin Programming	<ul style="list-style-type: none"> • Basics of Kotlin, Operations and Priorities, • Decision Making • Loop Control, Data Structures(Collections), • Functions • Object Oriented Programming: Inheritance abstract, interface, super and this, visibility modifiers.
2	Introduction to Android & Android Application Design	<ul style="list-style-type: none"> • The Open Handset Alliance, The Android Platform, Android SDK • Building a sample Android application • Anatomy of an Android applications, Android terminologies • Application Context, Activities, Services, Intents • Receiving and Broadcasting Intents • Android Manifest File and its common settings • Using Intent Filter, Permissions • Managing Application resources in a hierarchy • Working with different types of resources
3	Android User Interface Design	<ul style="list-style-type: none"> ▪ User Interface Screen elements <ul style="list-style-type: none"> • Button, EditText, TextView, DatePicker, TimePicker, ProgressBar, ListView, GridView, RadioGroup, ImageButton, Fragment ▪ Designing User Interfaces with Layouts <ul style="list-style-type: none"> • Relative Layout, Linear Layout, Table Layout etc ▪ Dialogs ▪ Drawing and Working with Animation <ul style="list-style-type: none"> • Frame By Frame Animation ▪ Twined Animation
4	Database Connectivity Using SQLite and Content Provider	<ul style="list-style-type: none"> • Using Android Data and Storage APIs • Managing data using SQLite • Sharing Data Between Applications with Content Providers



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5	Location Based Services (LBS), Common Android API, Notifications, Services, Deployment of applications	<ul style="list-style-type: none">• Using Global Positioning Services (GPS)• Geocoding Locations• Mapping Locations• Many more with location based services• Android networking API• Android web API• Android telephony API• Notifying the user, Notifying with the status bar• Vibrating the phone• Blinking the lights• Customizing the notifications Services• Application development using JSON in MySQL• Publish android application
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Notes: Android application must be developed using ANDROID STUDIO 4.0

Reference Books:

- (1) Learn Android Studio 3 with Kotlin – Teg Hagos – Apress – 2019
- (2) Headfirst Kotlin, A Brain Friendly Guide – Dawn Griffiths, David Griffiths – Orilly – 2019
- (3) Professional Android 2 Application Development Reto Meier, Wiley India Pvt Ltd (2011)
- (4) Beginning Android Mark L Murphy, Wiley India Pvt Ltd
- (5) Android Developer Fundamental Course – Practical Book – 2018

Course Outcomes:

- Understand the basic of KOTLIN programming.
- Understand the basic of Android and Android Application Design.
- Understand the different user interface elements and develop application with those widgets.
- Understand, apply and develop application with SQLite and Content Providers.
- Understand, apply and develop application with Location based services, notification services.



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CS-32: Programming with ASP.NET		
<p>Objectives:</p> <ul style="list-style-type: none"> • Familiarize students with the basic concepts of ASP.NET • Explore the different approaches to building web applications in ASP.NET • Learn to integrate databases with ASP.NET applications using technologies like ADO.NET <p>Prerequisites:</p> <ul style="list-style-type: none"> • Basic Programming Knowledge • Basic Understanding of HTML, CSS, OOP Concepts and C#.NET • Having a general understanding of web development concepts such as client-server architecture, web servers etc. 		
Unit No.	Topic	Detail
1	Framework and Web Contents Validation Controls	<ul style="list-style-type: none"> • Overview of Asp.NET Framework • Client Server Architecture • Application Web Servers • Types of Files in Asp.NET • Types of controls in Asp.NET • Page Architecture • Web form • Introduction to standard Controls (Buttons, Textbox, Checkbox, Lable, Panel, Listbox, Dropdownlist etc.) • Running an Asp.Net Application, File Upload Control • What is Validation? <ul style="list-style-type: none"> • Client Side Validation • Server Side Validation • Types (RequiredField Validator, Range Validator, CompareField Validator, RegularExpression Validator, Custom Validator, ValidationSummary Control)
2	State Management	<ul style="list-style-type: none"> • What is State? • Why is it required in Asp.Net? • Client Side State Management • Server Side State Management • Various State Management Techniques (View State, Query String, Cookie, Session State, Application State)



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3	ADO .NET and Database	<ul style="list-style-type: none"> • Architecture of ADO.NET • ADO.NET Classes for Connected and Disconnected Architecture (Connection, Command, DataReader, DataAdapter, DataSet, DataColumn, DataRow, DataConstraints, DataView etc.) • The Gridview Control, The Repeater Control • Binding Data to DataBound Controls, • Displaying Data in a webpage using SQLDataSource Control • DataBinding Expressions
4	Master Pages and Theme Caching, Application Pages and Data	<ul style="list-style-type: none"> • What is Master Page? • Requirement Of a Master Page in an Asp.NET application • Designing Website with Master Page, Theme and CSS • Overview of Caching <ul style="list-style-type: none"> • Page Output Caching • Partial Page Caching, Absolute Cache Expiration • Sliding Cache Expiration • Data Caching
5	Working with XML ASP.NET Application Configuration and Deployment of Application	<ul style="list-style-type: none"> • Reading Datasets From XML • Writing DataSets With XML • WebServices (Introduction, HTTP, SOAP, UDDI, XML, Creating a Web Service, Consuming a Web Service) • Introduction To Web.Config • Common Configuration Sections • AppSettings • Tracing • Custom Errors • Authentication And Authorization • Deployment of Application in web server

Reference Books:

- ASP.NET - Unleashed
- ASP.NET – Wrox Publication
- Pro ASP.NET Core MVC 2 Book by Adam Freeman
- Introduction to ASP.NET Web Programming using the Razor Syntax (C#) by Tom FitzMacken

Course Outcomes:

- Understand the ASP.NET framework and different controls.
- Understand form validation, apply form validation control also understand state management.
- Understand ADO .NET architecture and developing application with LINQ.
- Understand and apply concept of Master Page, CSS & Theme.
- Understand configuration of application with XML.



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CS-33: Machine Learning with Python		
Objectives: <ul style="list-style-type: none"> To Understand and develop model of ML with Python. Apply ML techniques to real-world data sets and problems. Learn how to deploy machine learning models into production environments. Prerequisites: <ul style="list-style-type: none"> Basic Understanding of Python Programming. 		
Unit No.	Topic	Detail
1	Introduction to Machine Learning	<ul style="list-style-type: none"> Introduction to ML, Relation of ML with AI and DL, Defining Machine Learning, How machines learn, types of machine learning: supervised learning, unsupervised learning, reinforcement learning, applications of machine learning.
2	Supervised Learning	<ul style="list-style-type: none"> Regression: Pre-processing data using different techniques – mean removal, scaling, normalization, binarization, label encoding, linear regression, case study implementation using Python Classification: Building simple classifier, logistic regression classifier, Naïve bayes classifier, training and testing dataset, accuracy using cross-validation, visualizing confusion matrix, extracting the performance report. Predictive Modeling: Building linear and non-linear classifier using Support Vector Machine (SVM), extracting confidence measurements, Case study implementation using Python.
3	Unsupervised Learning	<ul style="list-style-type: none"> Clustering: Data using k-means clustering, compressing image using vector quantization, mean shift clustering model, agglomerative clustering, case study implementation using Python.
4	Natural Language Processing	<ul style="list-style-type: none"> Natural Language Processing: <ul style="list-style-type: none"> pre-processing data, stemming data, using lemmatization, diving chunks, text classifier, case study implementation using Python.
5	Computer Vision with OpenCV	<ul style="list-style-type: none"> Object Detection: <ul style="list-style-type: none"> Detecting and tracking objects using Haar cascades from images and videos Detecting face, eyes, mouth, nose, pupils



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Reference Books:

- “Machine Learning” by Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das - Pearson
- “Python Machine Learning Cookbook” by Prateek Joshi – PACKT Publishing – 2016 Edition.
- “OpenCV: Computer Vision Projects with Python – Learning Path” by Joseph howse, Prateek Joshi, Michael Beyeler – PACKT Publishing – 2016 Edition.

Course Outcomes:

- To define and explain machine learning and its relation with AI and DL along with types of ML.
- To determine regression or classification supervised learning method of ML to any real-life application and estimate accuracy of the model.
- To be able to contrast various unsupervised learning methods and solve any real0life situation using ML and estimate accuracy of the model.
- To solve any fundamental text-processing.
- To construct a model to detect object from it.



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CS-34 : Practical And Viva Based On CS – 31	
Topics	Marks
CS – 31	100

CS-35 : Practical And Viva Based On CS – 32 and CS - 33	
Topics	Marks
CS – 32 and CS – 33	100

Note:

- Practical examination may be arranged before or after theory exam.

CS-36 : Project Viva	Total Marks: 100
Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of semester - V or semester - VI. <u>(At the time of Project-Viva Examinations student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)</u>	

Note:

- Project must be submitted before two weeks of commencement of theory exam.
- Project viva examination may be arranged before or after theory exam.
- During the project viva examination project must be run.