College of Computer, Science & Information Technology - Junagadh

AFFILIATED TO BHAKTA KAVI NARSINH MEHTA UNIVERSITY

न हि ज्ञानेन सदृशं पवित्रमिह विद्यते

C C S I T

✦ **Syllabus** ✦

B.Sc.(IT)

[Bachelor of Science in Information Technology]

[Semester – V & VI]

Academic Year : 2020 – 21

(Effective from June – 2020)

(SEMESTER-V)

Subject Code	Subject	Credit	Int. Marks	Ext. Marks	Total Marks
CS-25	Advance JAVA Programming (J2EE)	5	30	70 (14x5)	100
CS-26	Programming with ASP.NET	5	30	70 (14x5)	100
CS-27	Search Engine Techniques & Digital Technology Trends	5	30	70 (14x5)	100
CS-28	Practical – 1 (based on CS-25)	5	-	-	100
CS-29	Practical – 2 (based on CS-26 & CS-27)	5	-	-	100
CS-30	Project Viva	5	-	-	100
Total Credits		30	Total Marks		600

(SEMESTER-VI)

Subject Code	Subject	Credit	Int. Marks	Ext. Marks	Total Marks
CS-31	Mobile Computing using Android and iPhone	5	30	70 (14x5)	100
CS-32	Data Warehousing with SQL Server 2012	5	30	70 (14x5)	100
CS-33	Internet of Things (IOT)	5	30	70 (14x5)	100
CS-34	Practical – 1 (based on CS-31)	5	-	-	100
CS-35	Practical – 2 (based on CS-32 & CS-33)	5	-	-	100
CS-36	Project Viva	5	-	-	100
Total Credits		30	Total Marks		600

General Instructions:
1. Time duration of each theory paper will be of Two and Half hours.
2. Total marks of each theory paper will be 70 marks.
3. There will be five questions.
4. All questions are compulsory.

Instructions to the candidates for Practical Examination:-
1. Practical Exam. would be conducted for 1 ½ days, All the students have to remain present at the examination center 15 minutes before the scheduled time for examination.
2. Students have to carry with them certified Journal, I – card, Examination Receipt, and other necessary requirements for examination.
3. Student should not leave the laboratory without the permission of examiner.
4. Use of calculator is allowed but the use of mobile phones is strictly prohibited.
5. The candidate has to leave the laboratory only after the submission of all the answer sheets of the exercises performed.

B.Sc.(IT) SEMESTER – V
CS-25 : Advance JAVA Programming(J2EE)

1. **The J2EE Platform, JDBC (Java Database Connectivity):**   **[20]**
   - ♣ Introduction to J2EE
   - ♣ Enterprise Architecture Styles:
     - o   Two-Tier Architecture
     - o   Three-Tier Architecture
     - o   N-Tier Architecture
   - ♣ Enterprise Architecture
   - ♣ The J2EE Platform
   - ♣ Introduction to J2EE APIs (Servlet, JSP, EJB, JMS, JavaMail, JSF, JNDI)
   - ♣ Introduction to Containers
   - ♣ Tomcat as a Web Container
   - ♣ Introduction of JDBC
   - ♣ JDBC Architecture
   - ♣ Data types in JDBC
   - ♣ Processing Queries
   - ♣ Database Exception Handling
   - ♣ Discuss types of drivers
   - ♣ JDBC Introduction and Need for JDBC
   - ♣ JDBC Architecture
   - ♣ Types of JDBC Drivers
   - ♣ JDBC API for Database Connectivity (java.sql package)
   - ♣ Statement, Prepared Statement
   - ♣ Callable Statement
   - ♣ Result Set Meta Data
   - ♣ Database Meta Data
   - ♣ Other JDBC APIs
   - ♣ Connecting with Databases (MySQL, Access, Oracle)

2. **RMI, Servlet :**   **[20]**
   - ♣ RMI overview
   - ♣ RMI architecture
   - ♣ Stub and Skeleton
   - ♣ Developing and Executing RMI application
   - ♣ Servlet Introduction
   - ♣ Architecture of a Servlet
   - ♣ Servlet API (Javax.servlet and avax.servlet.http)
   - ♣ Servlet Life Cycle
   - ♣ Developing and Deploying Servlets
   - ♣ Handling Servlet Requests and Responses
   - ♣ Reading Initialization Parameters
   - ♣ Session Tracking Approaches (URL Rewriting, HiddenForm Fields, Cookies, Session API)
   - ♣ Servlet Collaboration
   - ♣ Servlet with JDBC

3. **JSP, Java Beans**   **[20]**
   - ♣ Introduction to JSP and JSP Basics
   - ♣ JSP vs. Servlet
   - ♣ JSP Architecture
   - ♣ Life cycle of JSP
   - ♣ JSP Elements: Directive Elements, Scripting Elements, Action Elements
     - • Directives Elements (page, include, taglib)
     - • Scripting Elements (Declaration, scriptlet, expression)
     - • Action Elements (JSP:param, JSP:include,JSP:Forward, JSP:plugin)

- ♣ JSP Implicit Objects
- ♣ JSP Scope
- ♣ Including and Forwarding from JSP Pages
- ♣ Include Action
- ♣ Forward Action
- ♣ Working with Session & Cookie in JSP
- ♣ Error Handling and Exception Handling with JSP
- ♣ JDBC with JSP
- ♣ JavaBean Properties
- ♣ JavaBean Methods
- ♣ Common JavaBean packaging

4. MVC Architecture, EJB, Hibernate [20]
- ♣ Introduction to MVC
- ♣ Implementation of MVC Architecture
- ♣ Introduction
- ♣ Types of EJB, Benefits of EJB, Restriction on EJB
- ♣ Session Beans
- ♣ Entity Beans
- ♣ Message-driven beans
- ♣ Timer service
- ♣ Introduction to Hibernate
- ♣ Need for hibernate
- ♣ Features of hibernate
- ♣ Disadvantages of Hibernate
- ♣ Exploring Hibernate Architecture
- ♣ Downloading and Configuring and necessary files to Hibernate in Eclipse
- ♣ Jars files of hibernate.
- ♣ Hibernate Configuration file
- ♣ Hibernate Mapping file
- ♣ Basic Example of Hibernate
- ♣ Annotation
- ♣ Hibernate Inheritance
- ♣ Inheritance Annotations
- ♣ Hibernate Sessions

5. Spring, Struts [20]
- ♣ Introduction of Spring Framework
- ♣ Spring Architecture
- ♣ Spring Framework definition
- ♣ Spring & MVC
- ♣ Spring Context definition
- ♣ Inversion of Control (IoC) in Spring
- ♣ Aspect Oriented programming in Spring (AOP)
- ♣ Understanding Struts Framework
- ♣ Comparision with MVC using Request Dispatcher and the EL
- ♣ Struts Flow of Control
- ♣ Processing Requests with Action Objects
- ♣ Handling Request Parameters with Form Beans
- ♣ Prepopulating and Redisplaying Input Forms
- ♣ Using Properties Files

Reference Books:
1. The Complete Reference Java 2 - Herbert Schildt and Patrick Naughton.
2. Java Server Programming For Professionals, Ivan Bayross, Sharanam Shah – Shroff publication.
3. Advanced Java Programming [ISBN: 978 - 93 - 81786 - 91 – 8] by Bharat & Company.
4. Developing Java Servlets – Techmedia.
5. JSP Beginner's Guide – Tata McGraw Hill by Gary Bolling, Bharathi Nataragan.
6. Spring and Hibernate, K. Santosh Kumar, - Tata McGraw-Hill.

7. Hibernate Made Easy : Simplified Data Persistence with Hibernate and JPA (Java Persistence API) Annotations by Cameron Wallace McKenzie, Kerri Sheehan
8. Sprint Framework : A Step by Step Approach for Learning Spring Framework – CreateSpace Independent Publishing Platform
9. Beginning Hibernate Second Edition By Jeff Linwood, Dave Minte - APress

Reference Website
1. https://www.w3schools.com/java
2. https://www.javatpoint.com/java-tutorial
3. https://www.tutorialspoint.com/java
4. https://www.guru99.com/java-tutorial.html
5. https://beginnersbook.com/java-tutorial-for-beginners-with-examples

CS – 26 : Programming with ASP.NET

Unit-1 : Framework & Web Contents Validation Controls
♣ Overview of Asp.NET Framework
♣ Client Server Architecture
♣ ASP.NET Life Cycle
♣ Application Web Servers
♣ Installation of IIS server
♣ Types of Files in Asp.NET
♣ Types of controls in Asp.NET
♣ Page Architecture
♣ Introduction to standard Controls (Buttons, Textbox, Checkbox, Lable, Panel, Listbox, Dropdownlist, FileUpload, AdRotator, CheckBoxList, RadioButtonList, ImageMap, Wizard, Calendar)
♣ Running an Asp.Net Application, File Upload Control
♣ What is Validation?
♣ Client Side Validation
♣ Server Side Validation
  • Types (Requiered Field Validator, Range Validator, CompareField Validator, RegularExpression Validator, Custom Validator, ValidationSummery Control)

Unit-2 : Ajax and State Management
♣ Setting up Ajax
♣ ASP.NET Ajax Control Toolkit With Basic Control
♣ 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

Unit-3 : ADO.NET & Database
♣ Architecture of ADO.NET
♣ Connected Architecture
♣ DisConnected Architecture
♣ ADO.NET Classes (Connection, Command,
♣ DataReader, DataAdapter, DataSet, DataColumn, DataRow, DataConstraints, DataView etc.)
♣ The Gridview Control, The Repeater Control
♣ Binding Data to DataBound Controls,
♣ Diplaying Data in a webpage using SQLDataSource Control
♣ DataBinding Expressions

Unit-4 : Master Pages, Theme Caching, Application Pages & Data
- ♣ What is Master Page?
- ♣ Requirement Of a Master Page in an Asp.NET application
- ♣ Overview of CSS3
- ♣ Designing Website with Master Page, Theme and CSS
- ♣ Overview
- ♣ Page Output Caching
- ♣ Partial Page Caching, Absolute Cache Expiration
- ♣ Sliding Cache Expiration
- ♣ Data Caching.

Unit-5 : Working with XML ASP.NET Application Configuration & Deployment of Application
- ♣ Reading Datasets From XML
- ♣ Writing DataSets With XML
- ♣ WebServices (Introduction, HTTP, SOAP, UDDI,XML, Creating 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 :
1. Asp.Net – Unleashed
2. Asp.Net – Wrox Publication
3. Programming With ASP.NET [ISBN: 978 - 81 - 909634 - 7 – 3] by Bharat & Company
4. Beginning.ASP.NET.3.5.in.C.Sharp.2008.From.Novice.to.Professional – Apress

Reference Website
1. https://www.tutorialspoint.com/asp.net/
2. https://www.guru99.com/asp-net-tutorial.html
3. https://www.javatpoint.com/asp-net-tutorial
4. https://www.w3schools.com/asp/
5. https://docs.microsoft.com/en-us/aspnet/tutorials
6. https://www.tutorialsteacher.com/core
7. https://www.tutorialsteacher.com/mvc/asp.net-mvc-tutorials
8. http://www.pragimtech.com/free-aspnet-video-tutorial.aspx
9. www.ajaxcontroltoolkit.net/
10. https://www.aspsnippets.com/Categories/AJAX-Control-Toolkit.aspx

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CS – 27 : Search Engine Techniques & Digital Technology Trends

Unit-1 : The Search Engines Reflecting Consciousness & Connecting Commerce Search Engine Basics
- ♣ Introduction of SE or What is Search Engine?
- ♣ Search Engine Components
  - Web Crawler
  - Database
  - Search Interface
- ♣ Search Engine Working
- ♣ Search Engine Architecture
- ♣ How Search Engines Drive Commerce on the Web?
- ♣ Determining Searcher Intent and Delivering Relevant & Fresh Content
- ♣ Country-Specific Search Engine
- ♣ Analysing Ranking Factors
- ♣ Types of Queries
- ♣ Determining Searcher Intent: A Challenge for Both Marketers and Search Engines.

Unit-2 : Determining SEO Objectives & Defining Site's Audience First Stages of SEO

* ♣ What is SEO ?
* ♣ Types of SEO
* ♣ Key Elements to Ethical SEO
* ♣ Developing an SEO Plan Prior to Site Development
* ♣ Understanding Audience and Finding Niche
* ♣ SEO for Raw Traffic
* ♣ SEO for E-Commerce Sales
* ♣ SEO for Mindshare/Branding
* ♣ SEO for Lead Generation and Direct Marketing
* ♣ SEO for Reputation Management
* ♣ SEO for Ideological Influence
* ♣ Auditing an Existing Site to Identify SEO Problems
* ♣ Identifying Current Server Statistics Software and Gaining Access
* ♣ Determining Top Competitors
* ♣ Assessing Historical Progress
* ♣ Benchmarking Current Indexing Status, Current Rankings, Current Traffic Sources and Volume
* ♣ Leveraging Business Assets for SEO

Unit-3 : Developing in SEO – Friendly Website

* ♣ Characteristics of User Friendly Website
* ♣ Website Development
  * Web Site Overview
  * Web Site Types
  * Web Site Designing
  * Web Developer Process
  * Web Developer Tools
  * Web Site Monetization (Method)
  * Introduction of Web Page, Web Browser & Web Server
* ♣ Optimization of Domain Names/URLs
* ♣ Redirects, Content Management System (CMS) Issues
* ♣ Optimizing Flash
* ♣ Best Practices for Multilanguage/Country Targeting
* ♣ Search Engine Processing (3 – Task)
  * Text Acquisition
  * Text Transformation
  * Index Creation
* ♣ Query Process
  * User Interaction
  * Ranking
  * Evaluation

Unit-4 : Keyword Research, Optimizing for Vertical Search

* ♣ Introduction of Key Word Research
* ♣ Determining Keyword Research
  * Value/Potential ROI,
  * Leveraging the Long Tail of Keyword Demand,
  * Trending, Seasonality,
  * Seasonal Fluctuations in Keyword Demand
  * Difference Long Tail & Short Tail
* ♣ Key World of Research Tools
* ♣ Traditional Approaches : Domain Expertise
* ♣ Introduction to Vertical Search
* ♣ Optimizing for Image Search
* ♣ Optimizing for Product Search
* ♣ Optimizing for News, Blog, and Feed Search
* ♣ Others: Mobile, Video/Multimedia Search

Unit-5 : Digital Technology Trends

♣ Digital Business
- Introduction to digital business,
- difference between digital business and ecommerce,
- digital business opportunities,
- Risk and barriers to digital business adoption

♣ Block Chain Technology
- Tracing blockchain origin,
- Blockchain feature,
- How Blockchain Work?

♣ Virtual Reality, Augmented Reality (AR):
- Introduction to Virtual Reality (VR),
- Needs of VR
- Introduction and brief history of AR
- Difference between AR and VR
- opportunities for augmented reality

CS – 28 : PRACTICAL – 1 (Based on CS – 25)

CS – 25 – Advance Java Programming (J2EE) [100 Marks]
- ♣ Each session is of 3 hours for the purpose of practical Examination.
- ♣ Practical examination may be arranged before or after theory exam

CS – 29 : PRACTICAL – 2 (Based on CS – 26 & CS – 27)

CS – 26 – Programming with ASP.NET [50 Marks] CS – 27 – Basic Python [50 Marks]
- ♣ Each session is of 3 hours for the purpose of practical Examination.
- ♣ Practical examination may be arranged before or after theory exam

CS – 30 : PROJECT – VIVA

♣ Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester. (At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)

Note :
- ♣ Project must be submitted before two week 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.

Bachelor of Science in Information Technology

Paper Style

Unit : 01

Question : 1 (A)	Answer The Following Question	(Only Three)	03
Question : 1 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 1 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 02

Question : 2 (A)	Answer The Following Question	(Only Three)	03
Question : 2 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 2 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 03

Question : 3 (A)	Answer The Following Question	(Only Three)	03
Question : 3 (B)	Answer The Following Questio	(Any Two out of Four)	06
Question : 3 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 04

Question : 4 (A)	Answer The Following Question	(Only Three)	03
Question : 4 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 4 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 05

Question : 5 (A)	Answer The Following Question	(Only Three)	03
Question : 5 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 5 (C)	Answer The Following Question	(Any One out of Two)	05

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B.Sc.(IT) SEMESTER – VI
CS-31 : Mobile Computing using Android and iPhone

Unit-1 : Introduction to Android & Android Application Design
- 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

Unit-2 : Android User Interface Design
- User Interface Screen elements
  - Button
  - EditText
  - TextView
  - DatePicker
  - TimePicker
  - ProgressBar
  - ListView
  - GridView
  - RadioGroup
  - ImageButton
  - Fragement
- Designing User Interfaces with Layouts
  - Relative Layout
  - Linear Layout
  - Table Layout
  - GridLayout etc
- Dialogs
- Drawing and Working with Animation
  - Frame By Frame Animation
  - Twined Animation
    - Fade In
    - Fade Out
    - Cross Fading
    - Blink
    - Zoom In
    - Zoom Out
    - Rotate
    - Move
    - Slide Up
    - Slide Down
    - Bounce
    - Sequential
    - Together

Unit-3 : Database Connectivity Using SQLite and Content Provider
- Using Android Data and Storage APIs
- Managing data using SQLite and Perform (insert update delete and select operation)
- Sharing Data Between Applications with Content Providers
- Introduction to rest api
- Introduction to Retrofit

Unit-4 : Location Based Services (LBS) Common Android API Notifications Services Deployment of applications
- Using Global Positioning Services (GPS)
- Geocoding Locations
- Mapping Locations
- Generate marker

- 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

Unit : 5 – Introduction To iPhone
- Introduction To X-Code (IDE)
- What is Storyboard
- Framework Design User Interface for button text view text field etc.
- Creating And Building Simple Application
- Cocoa Touch And MVC
  Notes : Android application must be developed using ANDROID STUDIO.

Reference Books :
1. Android Wireless Application Development By Lauren Darcey and Shane Conder Pearson Education 2nd ed. (2011)
2. Beginning iOS 6 Development By David Mark Jack Nutting Jeff LaMarche Fredrik Olsson Apress Publication.
3. Using SQLite By Jay A. Kreibich Publisher: O'Reilly Media
4. Mobile Computing using Android & iPhone [ISBN: 978-93-81786-93–2] by Bharat & Company
5. Professional Android 2 Application Development Reto Meier Wiley India Pvt Ltd (2011)
6. Beginning Android Mark L Murphy Wiley India Pvt Ltd

Reference Websites:
1. https://www.tutorialspoint.com/android/
2. https://www.javatpoint.com/android-tutorial
3. https://developer.android.com/guide
4. https://developer.android.com/training/basics/firstapp
5. https://www.studytonight.com/android/

CS – 32 : Data Warehousing with SQL Server 2012

Unit-1 : Introduction to Data Warehousing
- What Is a Data Warehouse?
- Data Warehousing Today
  - Business intelligence
  - Customer Relationship Management
  - Data Mining
- Future Trends in Data Warehousing.
  - Unstructured Data
  - Search
  - service oriented architecture (SOA)
  - Real-time data warehousing
- Data Warehouse Architecture
  - Data flow architecture
  - System architecture

Unit-2 : Designing and Implementation of Data Warehousing
- Logical Design for data warehouse
  - Data Warehousing Schemas
    - Star Join (Star Schema) and Snowflake structure

- Physical Design for data warehouse
  - Physical Design Structures
    - Tablespaces
    - Tables and Partitioned Tables
    - Views
    - Integrity Constraints
    - Dimensions
- Design dimension table fact table for data warehouse
- Design and implement effective physical data structure for data warehouse

Unit-3 : Creating ETL Solutions with SSIS Implementing Control Flow in SSIS
- Introduction to ETL with SSIS
- Introduction to SQL Server Data Tools
- Implementing data flow using SSIS
  - Configuring the Data Flow
    - Sources
    - Transformations
      - Derived Column
      - Conditional Split
    - Destinations
- Introduction to Control Flow
  - SSIS Tasks
- SSIS Containers
  - For Loop Container
  - Foreach Loop Container
    - Foreach File enumerator
    - Foreach Item enumerator
    - Foreach SMO enumerator
    - Foreach Nodelist enumerator
    - Foreach ADO enumerator
    - Foreach ADO.NET Schema
    - Foreach From Variable enumerator
  - Sequence Container
- Create Dynamic Packages Using Containers

Unit-4 : Enforcing Data Quality Extending SQL Server Integration Services
- Introduction to Data Quality
  - Installing and setting up the DQS
  - Creating a Knowledge Base
- Using Data Quality Service to cleanse data
- Using Data Quality Service to match data
- Using Scripts in SSIS
  - Script Task
    - The Script Task Dts Object
  - Script Component
- Using Custom components in SSIS

Unit-5 : Deploying & Configuring SSIS Packages Consuming Data in Data Warehouse
- Overview of SSIS Development
  - Packages
  - Control Flow vs. Data Flow
  - Package Functionality Extension Objects
- Deploying SSIS Projects
  - Deploying Packages to SQL Server Integration Services Catalog
  - Deployment Models In SSIS
- Planning SSIS Package Execution
- Introduction to Business Intelligence
- Introduction to Reporting
  - Basic Reports in SQL Reporting Services
  - Parameters in Reporting Services
  - Charts in SSRS

- SQL Server Reporting Services Configuration Manager (For Deploy Project in Report Server)
- Introduction to Data Analysis
- Create Cube and Dimensions Using Data Analysis

Notes : For Lab Practice : Microsoft SQL Server 2012 or Higher version

Reference Books :
1. Implementing a Data Warehouse with Microsoft® SQL Server® 2012 Dejan Sarka Matija Lah Grega
2. Building a Data Warehouse: With Examples in SQL Server – Vincent Rainardi-Apress (2014)
3. Data mining Explained A manager's guide to customer centric business intelligence by
4. Data mining by Pieter Adriaans Dolf Zantinge
5. Data warehousing in the real world A practical guide for business DSS by Sam Anahory

Reference Websites :
1. https://www.tutorialgateway.org/ssis/
2. https://www.tutorialspoint.com/ms_sql_server/ms_sql_server_integration_services.htm
3. https://www.guru99.com/ssis-tutorial.html

CS – 33 : Internet of Things (IOT)

Unit-1 : IOT an Overview
- Building an architecture
- Main design principles and needed capabilities
- An IOT architecture outline, standards considerations.
- M2M and IOT Technology Fundamentals –
  o Devices and gateways
  o Local and wide area networking
  o Data management, Business processes in IOT
  o Everything as a Service (XaaS)
  o M2M and IoT Analytics
  o Knowledge Management

Unit-2 : Reference Architecture
- IOT Architecture
  o State of the Art – Introduction
  o State of the Art - Reference Model and architecture,
- IOT Reference Model
- IOT Reference Architecture Introduction
- Functional, Information, Deployment, Operational, Other Relevant architectural View
- Real - World Design Constraints – Introduction
- Technical Design constraints - hardware is popular again
- Data representation and visualization
- Interaction and remote control

Unit : 3 – IOT Data Link Layer & Network Layer Protocols
- PHY/MAC Layer (3GPP MTC, IEEE 802.11, IEEE 802.15)
- Wireless HART
- Z-Wave, Bluetooth Low Energy
- Zigbee Smart Energy
- DASH7 - Network Layer-IPv4, IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP

Unit : 4 - Transport & Session Layer Protocols
- Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP) - (TLS, DTLS)
- Session Layer – HTTP, CoAP, XMPP, AMQP, MQTT

Unit : 5 – Service Layer Protocols & Security
- Service Layer - oneM2M, ETSI M2M, OMA, BBF – Security in IOT Protocols – MAC 802.15.4, 6LoWPAN, RPL, Application Layer

CS – 34 : PRACTICAL – 1 (Based on CS – 31)

CS – 31 – Mobile Computing using Android & iPhone [100 Marks]

- ♣ Each session is of 3 hours for the purpose of practical Examination.
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CS – 35 : PRACTICAL – 2 (Based on CS – 32 & CS – 33)

CS – 32 – Data Warehousing with SQL Server 2012 [50 Marks]
CS – 33 – Internet of Things (IOT) [50 Marks]

- ♣ Each session is of 3 hours for the purpose of practical Examination.
- ♣ Practical examination may be arranged before or after theory exam

CS – 36 : PROJECT – VIVA

- ♣ Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester. (At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)

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Bachelor of Science in Information Technology
Paper Style

Unit : 01

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Question : 1 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 1 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 02

Question : 2 (A)	Answer The Following Question	(Only Three)	03
Question : 2 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 2 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 03

Question : 3 (A)	Answer The Following Question	(Only Three)	03
Question : 3 (B)	Answer The Following Questio	(Any Two out of Four)	06
Question : 3 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 04

Question : 4 (A)	Answer The Following Question	(Only Three)	03
Question : 4 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 4 (C)	Answer The Following Question	(Any One out of Two)	05

Unit : 05

Question : 5 (A)	Answer The Following Question	(Only Three)	03
Question : 5 (B)	Answer The Following Question	(Any Two out of Four)	06
Question : 5 (C)	Answer The Following Question	(Any One out of Two)	05