

# E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai

Accredited by NAAC with 'A' Grade |

Accredited by NBA (CSE, EEE, MECH, IT, CIVIL, ECE)

NAGAPATTINAM – 611 002



## B.TECH INFORMATION TECHNOLOGY

Third Year – Sixth Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
<b>Theory Course</b>								
1702IT601	C# and .NET	2	0	4	4	50	50	100
1702IT602	Mobile Computing	3	0	0	3	40	60	100
1702IT603	Data Warehousing and Data Mining	3	0	2	4	50	50	100
1702IT604	Wireless Communication	3	0	0	3	40	60	100
	Professional Elective 3	3	0	0	3	40	60	100
	Open Elective (Elective 4)	3	0	0	3	40	60	100
<b>Laboratory Course</b>								
1704IT651	Mobile Application Development (Mini Project II)	0	0	2	1	50	50	100
1704GE651	Life Skills: Aptitude II	0	0	2	1	100	-	100
1704IT652	Industrial Visit Presentation	0	0	0	1	100	-	100
Total		<b>17</b>	<b>0</b>	<b>10</b>	<b>23</b>	<b>510</b>	<b>390</b>	<b>900</b>

L – Lecture | T – Tutorial | P – Practical | CA – Continuous Assessment | ES – End Semester

1702IT601

C# AND .NET

L	T	P	C
2	0	4	4

**PREREQUISITE:**

1. Programming in C, C++, Java Programming

**COURSE OBJECTIVES:**

1. Enable learners to write C# program using Object Oriented Programming Concepts.
2. Be familiar with .NET concepts.
3. Learn to think develop real time.NET applications.

**UNIT I INTRODUCTION TO C#**

**9Hours**

C# Programming Basics – Data types – Variables – Expressions – Operators – Conditional & Control Statements – Looping – Boxing & Unboxing.

**UNIT II OBJECT ORIENTED PROGRAMMING**

**9 Hours**

Classes – Objects – Constructors – Inheritance – Polymorphism – Event Handling – Threading – Exception Handling.

**UNIT III APPLICATION DEVELOPMENT ON .NET**

**9 Hours**

Building Windows Applications – Forms – Menu – Dialog Box – Data Set – ADO.NET – SQL Server Connectivity.

**UNIT IV WEB APPLICATION DEVELOPMENT ON .NET**

**9 Hours**

Programming using ASP.NET – XML – Virtual Applications – Session Management – Web.Config – Web Services – Versioning – Marshalling – Security.

**LIST OF EXPERIMENTS:**

**24 Hours**

**Module – 1:**

**10 Hours**

1. Study of C# and .NET frame work installation, configuration and running.
2. Wire C# program using Data types, Variables, Operators, Conditional & Control Statements, Looping, Boxing & Unboxing.
3. Develop C# program using class, object, inheritance, polymorphism, exception handling.
4. Implement Simple Web application using ASP.NET.
5. Implement Simple Database connectivity using ADO.NET.

**Module – 2:**

**14 Hours**

1. Perform console application for generating Fibonacci series, Prime number, Natural Numbers, etc.
2. Write a program to calculator using windows application.
3. Develop Online Banking and Transaction process using Event Handling and ADO.NET.
4. Create web application for shopping cart process using ASP.NET.
5. Implement Session Management process for email applications.
6. Perform String Manipulation with the String Builder and String Classes and C#.

**REQUIREMENTS:** Microsoft Visual Studio .Net framework.

**TOTAL: 60 HOURS**

**FURTHER READING:**

1. Develop real time applications using ASP.NET

**COURSE OUTCOMES**

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

- CO1: Understand the basic concepts of C# Programming
- CO2: Write C# program using classes, objects, and encapsulation
- CO3: Understand the concepts of .NET framework
- CO4: Design various applications using ADO.NET
- CO5: Implement Web and Database Applications using .NET
- CO6: Develop various real time applications using .NET concepts

**REFERENCES:**

1. Herbert Schidt, “The Complete Reference of C#”,Tata McGraw Hill, 2017.
2. Kogent Learning Solutions C# Programming and .NET 4.5 Paperback, Dreamtech Press, 2013.
3. Beginning ASP.NET 4.5 in C# (APRESS) Paperback – 2014, by Matthew MacDonald, Dreamtech Press; Apress Special Priced edition.
4. Building Micro services with .NET Core 2.0: Transitioning monolithic architectures using micro services with .NET Core 2.0 using C# 7.0, Packt Publishing Limited; 2nd Revised edition, 2017..

5. Paul C. Jorgensen, "Software Testing:- A Craftsman's Approach", Third Edition, Auerbach Publications, Taylor and Francis Group, 2010.
6. <http://nptel.ac.in/>

<b>1702IT602</b>	<b>MOBILE COMPUTING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**PREREQUISITE:**

1. Computer Networks.

**COURSE OBJECTIVES:**

1. Understand the basic concepts of mobile computing.
2. Be familiar with the network protocol stack.
3. Learn the basics of mobile telecommunication system.
4. Be exposed to Ad-Hoc networks
5. Gain knowledge about different mobile platforms and application development

**UNIT I INTRODUCTION 9 Hours**

Mobile Computing – Mobile Computing Vs Wireless Networking – Mobile Computing: Applications – Characteristics– Structure. MAC Protocols: Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

**UNIT II MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER 9 Hours**

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of Mobile Transport Layer, Traditional TCP Classical TCP improvements, TCP over 2.5/3G Wireless Networks, Performance Enhancing Proxies.

**UNIT III MOBILE TELECOMMUNICATION SYSTEM 9 Hours**

Global System for Mobile Communication (GSM): Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services. – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

**UNIT IV MOBILE AD-HOC NETWORKS 9 Hours**

Overview – Characteristics of MANET – spectrum of MANET applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Security in MANETs – Vehicular Ad Hoc networks (VANET) – MANET versus VANET.

**UNIT V OPERATING SYSTEM FOR MOBILE DEVICES 9 Hours**

Commercial Mobile Operating Systems – Features of Windows CE, PalmOS, Symbian OS, and Java Card Support for Mobility: Pile systems, WWW, Wireless Application Protocol – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – MCommerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.

**TOTAL: 45 HOURS**

**FURTHER READING:**

1. On site seminar at Telecommunication networks

**COURSE OUTCOMES**

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

- CO1: Explain the basics of mobile telecommunication system
- CO2: Choose the required functionality at each layer for given application
- CO3: Identify solution for each functionality at each layer
- CO4: Explain various mobile ad hoc network protocols
- CO5: Use simulator tools and design Ad hoc networks

**REFERENCES:**

1. Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2016.
2. Jochen H. Schller, "Mobile Communications", Second Edition, Pearson Education, New Delhi, 2014.
3. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2013.
4. Uwe Hansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 2012.
5. William.C.Y.Lee, "Mobile Cellular Telecommunications-Analog and Digital Systems", Second Edition, Tata Mc Graw Hill Edition ,2012.
6. C.K.Toth, "AdHoc Mobile Wireless Networks", First Edition, Pearson Education, 2012.
7. <http://nptel.ac.in/>

<b>1702IT603</b>	<b>DATA WAREHOUSING AND DATA MINING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>2</b>	<b>4</b>

**PREREQUISITE:**

Database Management Systems

**COURSE OBJECTIVES:**

1. Learn about the safe storage of data and architecture of data warehouse
2. Learn about the Elimination of errors from the data
3. Understand the Deleting data that is no longer important to the organization
4. Study the extraction of implicit, previously unknown, and potentially useful information from data
5. To help in the generation of reports for the management.

**UNIT I INTRODUCTION TO DATA WAREHOUSING 9 Hours**

Introduction-Data warehouse Architecture- Online Analytical Processing (OLAP) Multidimensional data model- Data warehouse schema -OLAP Guidelines - Data Extraction, Clean up, and Transformation Tools - Metadata.

**UNIT II DATA MINING PRIMITIVES AND CONCEPT DESCRIPTION 9 Hours**

Introduction to Data mining - Types of Data - Data Mining Functionalities - Interestingness of Patterns- Classification of Data Mining Systems - Data Mining Task Primitives-Pre-processing- Mining Frequent Patterns, Associations and Correlations - Mining Methods -Correlation Analysis - Constraint Based Association Mining.

**UNIT III CLASSIFICATION AND PREDICTION 9 Hours**

Introduction - Decision Tree Induction - Bayesian Classification - Back propagation -Support Vector Machines- Lazy Learners - Other classification methods - Prediction.

**UNIT IV CLUSTERING AND ASSOCIATION 9 Hours**

Cluster Analysis -Categorization of Major Clustering Methods - K-means- Partitioning Methods - Hierarchical Methods - Outlier Analysis -Density-Based Methods - Grid Based Methods - Model-Based Clustering Methods- Data Mining Applications.

**UNIT V ADVANCED TOPICS 9 Hours**

Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining - Graph Mining.

**LIST OF EXPERIMENTS: 15 Hours**

1. Exercise on Data warehouse design for an enterprise
  - a. Loading the dataset.
  - b. Data pre-processing.
- 2.Exercise on Discovering Association Rules
  - c. A-priori algorithm.
  - d. FP growth algorithm.
3. Exercise on Classification Algorithms
  - e. Bayesian classification.
  - f. Decision tree.
  - g. Support vector machine
4. Exercise on Clustering Algorithms
  - h. K-means clustering.
  - i. One Hierarchical clustering.
- 5.Exercises on Data mining tools
  - j. Applications of classification for web mining.
  - k. Case Study on Text Mining or any commercial application.

**SOFTWARE:** WEKA, Rapid Miner, DB Miner, Python or Equivalent.

**TOTAL: 60 HOURS**

**FURTHER READING:**

Data Science &Data Classifications

**COURSE OUTCOMES:**

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

CO1: Explain the concepts of Data Warehousing architecture and implementation.

CO2: Apply the association rules for mining applications.

CO3: Discuss on appropriate Classification/ Clustering techniques for various problems with high dimensional data.

CO4: Apply data mining techniques and methods to large data sets.

CO5: Use various data mining tools to solve different data sets

- CO6: Compare and contrast the various classifiers and clusters  
CO7: Illustrate various data mining techniques on complex data objects and advanced concepts

**REFERENCES:**

1. Jiawei. Han, MichelineKamber, “Data Mining: Concepts and Techniques”, Second Edition, Elsevier, New Delhi, 2017.
2. Vipin Kumar, Michael Steinbach,” Introduction to Data Mining”, Second Edition, Addison Wesley, 2015.
3. Dunham M, —Data Mining: Introductory and Advanced Topics, Prentice Hall, New Delhi, 2013.
4. <http://nptel.ac.in/>

**1702IT604**

**WIRELESS COMMUNICATION**

L	T	P	C
3	0	0	3

**PREREQUISITE:**

1. Principles of Communications
2. Computer Networks.

**COURSE OBJECTIVES:**

1. Know the characteristic of wireless channel
2. Learn the various cellular architectures
3. Understand the concepts behind various digital signaling schemes for fading channels
4. Be familiar the various multipath mitigation techniques
5. Understand the various multiple antenna systems.

**UNIT I WIRELESS CHANNELS**

**9 Hours**

Large scale path loss – Path loss models: Free Space and Two-Ray models -Link Budget design – Small scale fading- Parameters of mobile multipath channels – Time dispersion parameters- Coherence bandwidth – Doppler spread & Coherence time, Fading due to Multipath time delay spread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading – slow fading

**UNIT II CELLULAR ARCHITECTURE**

**9 Hours**

Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept- Frequency reuse - channel assignment- hand off- interference & system capacity- trunking& grade of service – Coverage and capacity improvement – case study: Cellular Networks.

**UNIT III MULTIPLE ANTENNA TECHNIQUES**

**9 Hours**

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift Keying, Gaussian Minimum Shift Keying, Error performance in fading channels – Case Study: OFDM principle – Cyclic prefix, Windowing, PAPR.

**UNIT IV MULTIPATH MITIGATION TECHNIQUES**

**9 Hours**

Equalization – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity – Micro and Macro diversity, Diversity combining techniques, Error probability in fading channels with diversity reception –Case Study: Rake receiver.

**UNIT V MIMO SYSTEMS AND TRANSMISSIONS**

**9 Hours**

MIMO systems – spatial multiplexing -System model -Pre-coding - Beam forming – transmitter diversity, receiver diversity- Channel state information-capacity in fading and non-fading channels.

**TOTAL: 45 HOURS**

**FURTHER READING:**

1. Wireless Sensor Networks.
2. Drone Assisted Networks

**COURSE OUTCOMES:**

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

- CO1: Characterize wireless channels
- CO2: Design and implement various signaling schemes for fading channels
- CO3: Design a cellular system
- CO4: Compare multipath mitigation techniques and analyze their performance
- CO5: Design and implement systems with transmit/receive diversity and MIMO systems and analyze their performance

**REFERENCES:**

1. Rappaport,T.S., “Wireless communications”, Second Edition, Pearson Education, 2016.
2. Andreas.F. Molisch, “Wireless Communications”, John Wiley – India, 2015.
3. David Tse and Pramod Viswanath, “Fundamentals of Wireless Communication”, Cambridge University Press, 2012.
4. UpenaDalal, “Wireless Communication”, Oxford University Press, 2014.
5. Van Nee, R. and Ramji Prasad, “OFDM for wireless multimedia communications”, Artech House, 2010.

6. <http://nptel.ac.in/>

<b>1704IT651</b>	<b>MOBILE APPLICATION DEVELOPMENT (MINI PROJECT II)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**PREREQUISITE :**

1. Java Programming.
2. Web Programming.

**COURSE OBJECTIVES:**

1. Introduce mobile application development tools
  2. Design and develop useful mobile applications with compelling user interfaces
  3. Create their own layouts and Views using Menus
  4. Transfer apps to mobile.
- a. Study of basics of mobile application development
- a. Introduction to Mobile Computing
  - b. Introduction to
  - c. Android Development Environment
- b. Study of Factors in Developing Mobile Applications
- a. Mobile Software Engineering
  - b. Frameworks and Tools
  - c. Generic UI Development
  - d. Android User

**TO DEVELOP A MINI-PROJECT USING FOLLOWING PROBLEM STATEMENTS AND PROJECT SELECTION BASED ON REAL TIME AND SOCIAL ISSUES**

1. Designing of UIs - VUIs and Mobile Apps, Text-to-Speech Techniques, Designing the Right UI
2. Multichannel and Multimodal UIs
3. Study of Intents and Services - Android Intents and Services, Characteristics of Mobile Applications, Successful Mobile Development
4. Storing and Retrieving Data - Synchronization and Replication of Mobile Data, Getting the Model Right, Android Storing and Retrieving Data, Working with a Content Provider
5. Communications Via Network and the Web - State Machine, Correct Communications Model, Android Networking and Web
6. Telephony - Deciding Scope of an App, Wireless Connectivity and Mobile Apps, Android Telephony
7. Notifications and Alarms – Performance, Performance and Memory Management, Android Notifications and Alarms
8. Graphics - Performance and Multithreading, Graphics and UI Performance, Android Graphics
9. Multimedia - Mobile Agents and Peer-to-Peer Architecture, Android Multimedia
10. Location - Mobility and Location Based Services, Android
11. Putting It All Together - Packaging and Deploying, Performance Best Practices, Android Field Service App
12. Security and Hacking- Active Transactions, More on Security, Hacking Android
13. Platforms and Additional Issues - Development Process, Architecture, Design, Technology Selection, Mobile App Development Hurdles, Testing

**TOTAL:45 HOURS**

**REQUIREMENTS:**

Android Studio or Eclipse or Equivalent

**ADDITIONAL EXPERIMENTS/ INNOVATIVE EXPERIMENTS:**

1. Mobile App for Educational Institution
2. Mobile App for Industries

**COURSE OUTCOMES**

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

CO1: Understand the technology and business trends impacting mobile applications

CO2: Understand the characterization and architecture of mobile applications

CO3: Understand enterprise scale requirements of mobile applications

CO5: Design and develop mobile applications using one application development framework

CO6: Covert developed application to mobile

**REFERENCES:**

1. Jonathan McCallister, Mobile Apps Made Simple: The Ultimate Guide to Quickly Creating, Designing and Utilizing Mobile Apps for Your Business - 2nd Edition, March“2015
2. Dan Hermes, Xamarin Mobile Application Development: Cross-Platform C# and Xamarin.Forms

Fundamentals, 2017

3. Ryan Cohen, Android Application Development for the Intel Platform, 2011

4. Valentino Lee, Mobile Applications: Architecture, Design, and Development: Architecture, Design, and Development, 2017

**1704GE651**

**LIFE SKILLS: APTITUDE – II**

L	T	P	C
0	0	2	1

**PREREQUISITE :**

Life Skills: Aptitude - I

**COURSE OBJECTIVES:**

1. To brush up problem solving skill and to improve intellectual skill of the students
2. To be able to critically evaluate various real life situations by resorting to Analysis Of key issues and factors
3. To be able to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
4. To enhance analytical ability of students
5. To augment logical and critical thinking of Student

**UNIT I PARTNERSHIP, MIXTURES AND ALLEGATIONS, PROBLEM ON AGES, SIMPLE INTEREST, COMPOUND INTEREST 6 Hours**

Introduction Partnership - Relation between capitals, Period of investments and Shares- Problems on mixtures - Allegation rule - Problems on Allegation – Problems on ages - Definitions Simple Interest - Problems on interest and amount - Problems when rate of interest and time period are numerically equal - Definition and formula for amount in compound interest - Difference between simple interest and compound interest for 2 years on the same principle and time period.

**UNIT II BLOOD RELATIONS, CLOCKS, CALENDARS 6 Hours**

Defining the various relations among the members of a family - Solving Blood Relation puzzles - Solving the problems on Blood Relations using symbols and notations - Finding the angle when the time is given - Finding the time when the angle is known - Relation between Angle, Minutes and Hours - Exceptional cases in clocks - Definition of a Leap Year - Finding the number of Odd days - Framing the year code for centuries - Finding the day of any random calendar date.

**UNIT III TIME AND DISTANCE, TIME AND WORK 6 Hours**

Relation between speed, distance and time - Converting kmph into m/s and vice versa - Problems on average speed - Problems on relative speed - Problems on trains - Problems on boats and streams - Problems on circular tracks - Problems on races - Problems on Unitary method - Relation between Men, Days, Hours and Work - Problems on Man-Day-Hours method - Problems on alternate days - Problems on Pipes and Cisterns.

**UNIT IV DATA INTERPRETATION AND DATA SUFFICIENCY 6 Hours**

Problems on tabular form - Problems on Line Graphs - Problems on Bar Graphs - Problems on Pie Charts - Different models in Data Sufficiency - Problems on data redundancy

**UNIT V ANALYTICAL AND CRITICAL REASONING 6 Hours**

Problems on Linear arrangement - Problems on Circular arrangement - Problems on Double line-up - Problems on Selections - Problems on Comparisons - Finding the Implications for compound statements - Finding the Negations for compound statements- Problems on assumption - Problems on conclusions - Problems on inferences - Problems on strengthening and weakening of arguments.

**Total: 30 Hours**

**COURSE OUTCOMES:**

At the end of the course, the student will be able to

CO1: Solve problems on Partnership, Mixture & Allegation and ages least time using shortcuts and apply real life situations.

CO2: Workout family relationships concepts, ability to visualize clocks & calendar and understand the logic behind a Sequence.

CO3: Calculate concepts of speed, time and distance, understand timely completion using time and work.

CO4: Learners should be able to understand various charts and interpreted data least time.

CO5: Workout puzzles, ability to arrange things in an orderly fashion

**REFERENCES:**

1. Arun Sharma, „How to Prepare for Quantitative Aptitude for the CAT“, 7<sup>th</sup> edition, McGraw Hills publication, 2016.
2. Arun Sharma, „How to Prepare for Logical Reasoning for CAT“, 4<sup>th</sup> edition, McGraw Hills publication, 2017.
3. R S Agarwal, „A modern approach to Logical reasoning“, revised edition, S.Chand publication, 2017.
4. R S Agarwal, „Quantitative Aptitude for Competitive Examinations“ revised edition, S.Chand publication, 2017.
5. Rajesh Verma, “Fast Track Objective Arithmetic”, 3<sup>rd</sup> edition, Arihant publication, 2018.
6. B.S. Sijwalii and InduSijwali, “A New Approach to REASONING Verbal & Non-Verbal”, 2<sup>nd</sup> edition, Arihant publication, 2014.

**1704IT652**

**INDUSTRIAL VISIT PRESENTATION**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

In order to provide the experiential learning to the students, shall take efforts to arrange at least two industrial visit / field visits in a year. A presentation based on Industrial visits shall be made in this semester and suitable credit may be awarded.

**ASSESSMENT PATTERN :**

**Continuous Assessment (100 Marks)**

<b>Distribution of marks for Continuous Assessment</b>	<b>Marks</b>
Test	40
Presentation / Quiz / Group Discussion	40
Report	20
<b>Total</b>	<b>100</b>

Grades (Excellent / Good / Satisfactory / Not Satisfactory)



1703MG002	PRINCIPLES OF MANAGEMENT			L	T	P	C	
				3	0	0	3	
<b>AIM:</b> The aim of this course is to address broad and general guideline that regulates decision making and behavior within a group or organization								
<b>COURSE OBJECTIVES:</b>								
<ol style="list-style-type: none"> <li>To enable the students to study the evolution of Management</li> <li>To relate, discuss, understand and present management principles, process and procedures.</li> <li>To knowledge and understanding of the principles of management will enable the student manager or employee</li> </ol>								
<b>UNIT I</b>	<b>INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS</b>						<b>9 Hours</b>	
Definition of Management – Science or Art – Manager Vs Entrepreneur - Types of managers - managerial roles and skills – Evolution of Management – Scientific, Human relations , System and contingency approaches.								
<b>UNIT II</b>	<b>PLANNING</b>						<b>9 Hours</b>	
Nature and purpose of planning – Planning Process – Types of planning – Objectives – Setting objectives – policies – Planning premises – Planning Tools and Techniques – Decision making steps and process.								
<b>UNIT III</b>	<b>ORGANISING</b>						<b>9 Hours</b>	
Nature and purpose – Formal and informal organization – Organization chart – Organization structure – Types – Line and staff authority – Departmentalization – Delegation of authority – Centralization and Decentralization – Job Design.								
<b>UNIT IV</b>	<b>DIRECTING</b>						<b>9 Hours</b>	
Foundations of Individual and Group behaviour – Motivation – Motivation theories – Motivational techniques – Job satisfaction – Job enrichment – Leadership – Types and theories of leadership – Communication – Process of communication – Barrier in communication – Effective communication –Communication and IT								
<b>UNIT V</b>	<b>CONTROLLING</b>						<b>9 Hours</b>	
System and process of controlling – Budgetary and non-budgetary control techniques – Use of computers and IT in Management control – Productivity problems and management – Control and performance – Direct and preventive control – Reporting								
						<b>TOTAL:</b>	<b>45 Hours</b>	
<b>FURTHER READING:</b> Decision roles of manager, Motivational thoughts.								
<b>COURSE OUTCOMES</b>								
At the end of this course, students will be able to, CO1: Explain the elements of Management and Organization. CO2: Summarize the types, policies, tools and techniques in Planning in Management CO3: Relate the job design and human resource management in Organizing CO4: Illustrate the skills of leadership and communication CO5: Interpret the controlling techniques in Management								
<b>REFERENCES:</b>								
<ol style="list-style-type: none"> <li>Stephen A. Robbins &amp; David A. Decenzo &amp; Mary Coulter, “Fundamentals of Management” 7 th Edition, Pearson Education, 2011.</li> <li>Harold Koontz &amp; Heinz Weihrich “Essentials of management” Tata McGraw Hill,1998.</li> <li>Robert Kreitner &amp; Mamata Mohapatra, “ Management”, Biztantra, 2008.</li> <li>JAF Stoner, Freeman R.E and Daniel R Gilbert “Management”, 6 th Edition,Pearson Education, 2004.</li> <li>Tripathy PC &amp; Reddy PN, “Principles of Management”, Tata McGraw Hill, 1999</li> </ol>								

1703IT011	SOCIAL NETWORK ANALYSIS			L	T	P	C	
				3	0	0	3	
<b>COURSE OBJECTIVES:</b>								
<ol style="list-style-type: none"> <li>Understand the concept of semantic web and related applications.</li> <li>Learn knowledge representation using ontology.</li> <li>Understand human behavior in social web and related communities.</li> <li>Learn visualization of social networks.</li> </ol>								
<b>UNIT I</b>	<b>INTRODUCTION</b>						<b>9 Hours</b>	
Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks - Applications of Social Network Analysis.								
<b>UNIT II</b>	<b>MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION</b>						<b>9 Hours</b>	
Ontology and their role in the Semantic Web: Ontology-based knowledge Representation – Ontology languages for								

the Semantic Web: Resource Description Framework - Web Ontology Language - Modeling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.	
<b>UNIT III</b>	<b>EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS</b> <span style="float: right;"><b>9 Hours</b></span>
Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks - Multi- Relational characterization of dynamic social network communities.	
<b>UNIT IV</b>	<b>PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES</b> <span style="float: right;"><b>9 Hours</b></span>
Understanding and predicting human behavior for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context – Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis - Trust transitivity analysis - Combining trust and reputation – Trust derivation based on trust comparisons - Attack spectrum and countermeasures.	
<b>UNIT V</b>	<b>VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS</b> <span style="float: right;"><b>9 Hours</b></span>
Graph theory - Centrality - Clustering - Node-Edge Diagrams - Matrix representation – Visualizing online social networks, Visualizing social networks with matrix-based representations - Matrix and Node-Link Diagrams - Hybrid representations - Applications - Cover networks - Community welfare - Collaboration networks - Co-Citation networks.	
<b>TOTAL: 45 Hours</b>	
<b>FURTHER READING:</b> Case Study of Social Media	
<b>COURSE OUTCOMES</b>	
At the end of this course, students will be able to, CO1: Develop semantic web related applications. CO2: Represent knowledge using ontology. CO3: Predict human behavior in social web and related communities. CO4: Visualize social networks.	
<b>REFERENCES:</b>	
1. Peter Mika, “Social Networks and the Semantic Web”, First Edition, Springer 2017. 2. Borko Furht, “Handbook of Social Network Technologies and Applications”, 1st Edition, Springer, 2015. 3. Guandong Xu ,Yanchun Zhang and Lin Li, “Web Mining and Social Networking – Techniques and applications”, First Edition Springer, 2013. 4. Dion Goh and Schubert Foo, “Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively”, IGI Global Snippet, 2011. 5. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, “Collaborative and Social Information, 2012 6. Retrieval and Access: Techniques for Improved user Modelling”, IGI Global Snippet, 2013. 7. John G. Breslin, Alexander Passant and Stefan Decker, “The Social Semantic Web”, Springer, 2010	

<b>1703IT012</b>	<b>OPEN SOURCE PROGRAMMING</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>AIM:</b> Introduces concepts, principles and applications of open source software. Discuss about open source software development process. Cover economy, business, societal and intellectual property aspects of open source software. Obtain hands-on experiences on open source software and related tools through developing various open source software applications such as mobile applications and Web applications.					
<b>COURSE OBJECTIVES:</b>					
1. Learn the concepts, strategies, and methodologies related to open source software development. 2. Learn the business, economy, societal and intellectual property issues of open source software. 3. Be familiar with open source software products and development tools currently available on the market. 4. Be able to utilize open source software for developing a variety of software applications, particularly Web applications					
<b>UNIT I</b>	<b>HISTORY AND EMERGENCE OF OPEN SOURCE SOFTWARE</b>	<b>9 Hours</b>			
The philosophy of OSS, Richard Stallman, The Cathedral and the Bazaar (CatB), Commercial software vs OSS, free software vs freeware. Open source development models. Application Programming Interface (API). GNU Project, Free Software Foundation - Community Building					
<b>UNIT II</b>	<b>OPEN STANDARD</b>	<b>9 Hours</b>			
National Information Standards Organization (NISO), The Digital Library Federation (DLF). The Dublin Core Metadata Initiative. MARC standards, Resource Description and Access (RDA). Open Archives Initiative. OAI-					

PMH. Search / Retrieval via URL (SRU), SRW/CQL. Java Platform, Enterprise Edition (Java EE).		
<b>UNIT III</b>	<b>OPEN SOURCE LICENSES</b>	<b>9 Hours</b>
GNU General Public License (GPL) version 2,3, GNU Lesser General Public License (LGPL) version 2.1,3, GNU Affero General Public License (AGPL) version 3, Apache License, Version 2.0, Artistic License 2.0, etc.		
<b>UNIT IV</b>	<b>CASE STUDY 1</b>	<b>9 Hours</b>
<b>Operating System:</b> The Linux operating system and its use both for desktops and as server software. <b>Web server:</b> Apache HTTP Server and its flavors. WAMP server (Windows, Apache, MySQL, PHP). Open Source MySQL. Apache, MySQL, PHP, Java as development platform.		
<b>UNIT V</b>	<b>CASE STUDY 2</b>	<b>9 Hours</b>
<b>Open Source Software:</b> Category of Open Source Software. OSS for podcasts, RDBMS, online social networks, etc. open source bibliometric software like pajek, ucinet, etc <a href="http://directory.fsf.org/GNU/">http://directory.fsf.org/GNU/</a>		
<b>TOTAL:</b>		<b>45 Hours</b>
<b>FURTHER READING:</b> Working with Open Source Platforms		
<b>COURSE OUTCOMES</b>		
At the end of this course, students will be able to, CO1: Understand the concept of open source software CO2: Explain various open standard CO3: Illustrate open source licenses CO4: Use various open source operating systems and web servers CO5: Understand various open source software		
<b>REFERENCES:</b>		
<ol style="list-style-type: none"> <li>1. <u>Andrew St. Laurent</u> Understanding Open Source &amp; Free Software Licensing: Guide to Navigating Licensing Issues in Existing &amp; New Software , Shroff/O'Reilly; First edition (2016), ISBN-10: 9352132807</li> <li>2. <u>Dennis Matotek</u> (Author), <u>James Turnbull</u> (Author), <u>Peter Lieverdink</u> Pro Linux System Administration: Learn to Build Systems for Your Business Using Free and Open Source Software Apress; 2nd ed. Edition, 2017, ISBN-10: 1484220072</li> <li>3. <u>Kailash Vadera</u> (Author), <u>Bhavyesh Gandhi</u> Open Source Technology Laxmi Publications; First edition 2012</li> <li>4. <a href="http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&amp;tid=11216&amp;mode=toc">http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&amp;tid=11216&amp;mode=toc</a> <a href="http://www.catb.org/~esr/writings/cathedral-bazaar/">http://www.catb.org/~esr/writings/cathedral-bazaar/</a> <a href="http://oreilly.com/catalog/osfreesoft/book/http://www.diglib.org">http://oreilly.com/catalog/osfreesoft/book/http://www.diglib.org</a></li> <li>5. The Dublin Core Metadata Initiative &lt;<a href="http://dublincore.org/">http://dublincore.org/</a>&gt;</li> <li>6. MARC standards &lt;<a href="http://www.loc.gov/marc/">http://www.loc.gov/marc/</a>&gt;</li> <li>7. Resource Description and Access (RDA) <a href="http://www.rdaonline.org/">http://www.rdaonline.org/</a></li> <li>8. WAMP server (Windows, Apache, MySQL, PHP) &lt;<a href="http://www.wampserver.com/en">http://www.wampserver.com/en</a>&gt;</li> </ol>		

<b>1703IT013</b>	<b>SOFTWARE ARCHITECTURES</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>AIM:</b> The main objective of this course to understand Concepts and methodologies for the systematic analysis, development, evolution, and reuse of software architectural design, styles, elements and connectors.					
<b>PREREQUISITE:</b> Software Engineering					
<b>COURSE OBJECTIVES:</b>					
<ol style="list-style-type: none"> <li>1. Understand architectural requirements</li> <li>2. Identify architectural structure</li> <li>3. Develop architectural documentation</li> <li>4. Generate architectural alternatives</li> <li>5. Evaluate the architecture against the drivers</li> </ol>					
<b>UNIT I</b>	<b>ARCHITECTURAL DRIVERS</b>	<b>9 Hours</b>			
Introduction – Standard Definitions of Software Architecture– Architectural structures – Architecture Business Cycle – Quality Attribute Workshop (QAW) – Documenting Quality Attributes – Six part scenarios					
<b>UNIT II</b>	<b>ARCHITECTURAL VIEWS AND DOCUMENTATION</b>	<b>9 Hours</b>			
Introduction – Standard Definitions for views – Structures and views– Representing views-available notations – Good practices in documentation– Documenting the Views using UML – Need for formal languages - Architectural Description Languages – ACME					
<b>UNIT III</b>	<b>ARCHITECTURAL STYLES</b>	<b>9 Hours</b>			
Introduction – Data flow styles – Call-return styles – Shared Information styles – Event styles – Case studies for each style					
<b>UNIT IV</b>	<b>ARCHITECTURAL DESIGN</b>	<b>9 Hours</b>			
Approaches for architectural design – System decomposition – Attributes driven design – Architecting for specific quality attributes – Performance, Availability – Security – Architectural conformance.					
<b>UNIT V</b>	<b>ARCHITECTURE EVALUATION AND SOME SPECIAL TOPICS</b>	<b>9 Hours</b>			

Need for evaluation – Scenario based evaluation against the drivers – ATAM and its variations – Case studies in architectural evaluations – SOA and Web services – Cloud Computing – Adaptive structures	
<b>TOTAL:</b>	<b>45 Hours</b>
<b>FURTHER READING:</b> Working with Open Source Platforms	
<b>COURSE OUTCOMES</b>	
At the end of this course, students will be able to, CO1: Explain key architectural drivers CO2: Explain the influence of architecture on business and technical activities CO3: Identify key architectural structures CO4: Adopt good practices for documenting the architecture CO5: Explain how to use formal languages to specify architecture CO6: Describe the recent trends in software architecture	
<b>REFERENCES:</b>	
1. Len Bass, Paul Clements, and Rick Kazman, “Software Architectures Principles and Practices”, 2n Edition, Addison-Wesley, 2016. 2. Anthony J Lattanze, “Architecting Software Intensive System. A Practitioner's Guide”, Auerbach Publications, 2013. 3. Paul Clements, Felix Bachmann, Len Bass, David Garlan, James Ivers, Reed Little, Paulo Merson, Robert Nord, and Judith Stafford, “Documenting Software Architectures. Views and Beyond”, 2 <sup>nd</sup> Edition, Addison-Wesley, 2012. 4. David Garlan and Mary Shaw, “Software architecture: Perspectives on an emerging discipline”, Prentice Hall, 2011. 5. Mark Hansen, “SOA Using Java Web Services”, Prentice Hall, 2013 6. David Garlan, Bradley Schmerl, and Shang-Wen Cheng, “Software Architecture-Based Self-Adaptation,” 31-56. Mieso K Denko, Laurence Tianruo Yang, and Yan Zang (eds.), “Autonomic Computing and Networking”. Springer Verlag, 2014. 7. <a href="http://nptel.ac.in/">http://nptel.ac.in/</a>	

<b>1703IT014</b>	<b>COMPUTER VISION</b>				<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>				
<b>AIM:</b> The main objective of this course is to understand the concepts of computer vision using image processing and machine learning systems									
<b>PREREQUISITE:</b> Computer Graphics and Multimedia, Artificial Intelligence									
<b>COURSE OBJECTIVES:</b>									
1. Review image processing techniques for computer vision 2. Learn the methods of sharpening, shaping and modeling 3. Introduce the concepts of 3D modeling and motion analysis 4. Study of various computer vision applications									
<b>UNIT I</b>	<b>IMAGE PROCESSING</b>							<b>9 Hours</b>	
Computer Vision - Image Processing: Architecture and Applications – Visible Surface Identification Methods – Filters – Sharpening and Smoothing Filters – Morphology									
<b>UNIT II</b>	<b>SHAPES AND REGION</b>							<b>9 Hours</b>	
Shape Analysis – Object Labeling – Skeleton Models – Boundary Tracking – Chain Codes – Examples of Descriptor									
<b>UNIT III</b>	<b>ARCHITECTURAL DESIGN</b>							<b>9 Hours</b>	
Support Vector Machine – Hough Transform – RANSAC Model – Line, Circle, Ellipse and Polygon Detection – Case Study: Human Iris Identification, Facial Expression									
<b>UNIT IV</b>	<b>3D MODELING AND TOOLS</b>							<b>9 Hours</b>	
3D representation and transformation – 3D viewing – 3D object recognition – Motion Representations – Multimedia – Animation – Virtual Reality – Case study: Animation tools									
<b>UNIT V</b>	<b>APPLICATIONS</b>							<b>9 Hours</b>	
Face Recognition – Photo Album – Motion Tracking – Surveillance – Number Plate Recognition – In vehicle Vision System									
<b>TOTAL:</b>							<b>45 Hours</b>		
<b>COURSE OUTCOMES</b>									
At the end of this course, students will be able to, CO1: Understand the fundamental concepts of Computer vision techniques CO2: Apply various shaping and sharpening fillers to images CO3: Analysis different transform techniques CO4: Understand the concepts of 3D vision and motions CO5: Explain different applications of computer vision									

**REFERENCES:**

1. E. R. Davies, "Computer & Machine Vision", Fourth Edition, Academic Press, 2016.
2. R. Szeliski, "Computer Vision: Algorithms and Applications", Springer 2012.
3. Simon J. D. Prince, "Computer Vision: Models, Learning, and Inference", Cambridge University Press, 2012.
4. Mark Nixon and Alberto S. Aquado, "Feature Extraction & Image Processing for Computer Vision", Third Edition, Academic Press, 2012.
5. D. L. Baggio et al., "Mastering OpenCV with Practical Computer Vision Projects", Packt Publishing, 2014.
6. Jan Erik Solem, "Programming Computer Vision with Python: Tools and algorithms for analyzing images", O'Reilly Media, 2013.
7. <http://nptel.ac.in/>