

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)

NAGAPATTINAM – 611 002



B.TECH INFORMATION TECHNOLOGY

Third Year – Sixth Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
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
1703IT013	Software Architecture	3	0	0	3	40	60	100
	Open Elective	3	0	0	3	40	60	100
Laboratory Course								
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		17	0	8	23	510	390	900

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

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/>

1702IT602

MOBILE COMPUTING

L	T	P	C
3	0	0	3

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

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.ToH, “AdHoc Mobile Wireless Networks”, First Edition, Pearson Education, 2012.
7. <http://nptel.ac.in/>

1702IT603	DATA WAREHOUSING AND DATA MINING	L	T	P	C
		3	0	2	4

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

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

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/>

1703IT013

SOFTWARE ARCHITECTURES

L	T	P	C
3	0	0	3

PREREQUISITE:

Software Engineering

COURSE OBJECTIVES:

1. Understand architectural requirements
2. Identify architectural structure
3. Develop architectural documentation
4. Generate architectural alternatives
5. Evaluate the architecture against the drivers

UNIT I ARCHITECTURAL DRIVERS

9 Hours

Introduction – What is software architecture? – Standard Definitions – Architectural structures – Influence of software architecture on organization-both business and technical – Architecture Business Cycle- Introduction – Functional requirements – Technical constraints – Quality Attributes.

UNIT II QUALITY ATTRIBUTE WORKSHOP

9 Hours

Quality Attribute Workshop – Documenting Quality Attributes – Six part scenarios – Case studies.

UNIT III ARCHITECTURAL VIEWS

9 Hours

Introduction – Standard Definitions for views – Structures and views - Representing views-available notations – Standard views – 4+1 view of RUP, Siemens 4 views, SEI's perspectives and views – Case studies.

UNIT IV ARCHITECTURAL STYLES

9 Hours

Introduction – Data flow styles – Call-return styles – Shared Information styles - Event styles – Case studies for each style.

UNIT V DOCUMENTING THE ARCHITECTURE

9 Hours

Good practices – Documenting the Views using UML – Merits and Demerits of using visual languages– Need for formal languages -Architectural Description Languages – ACME – Case studies. Special topics: SOA and Web services – Cloud Computing – Adaptive structures.

TOTAL: 45 HOURS

FURTHER READING:

Working with Open Source Platforms

REFERENCES:

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”, 2nd 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. <http://nptel.ac.in/>

1704IT651

**MOBILE APPLICATION DEVELOPMENT
(MINI PROJECT II)**

L	T	P	C
0	0	2	1

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

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

1704IT652

INDUSTRIAL VISIT PRESENTATION

L	T	P	C
0	0	2	1

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)

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

Grades (Excellent / Good / Satisfactory / Not Satisfactory)

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

REFERENCES:

1. Arun Sharma, 'How to Prepare for Quantitative Aptitude for the CAT', 7th edition, McGraw Hills publication, 2016.
2. Arun Sharma, 'How to Prepare for Logical Reasoning for CAT', 4th 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", 3rd edition, Arihant publication, 2018.
6. B.S. Sijwalii and InduSijwali, "A New Approach to REASONING Verbal & Non-Verbal", 2nd edition, Arihant publication, 2014.