**Dr. Mahalingam College of Engineering
and Technology,Pollachi - 642003
(An Autonomous Institution)**

ONE CREDIT COURSES

Curriculum & Syllabi (2015-2016)

About One Credit Course

The Value Added Education Courses aim to provide additional learner centric graded skill oriented technical training with the primary objective of improving the employability skills of engineering students of MCET.

There is a spectrum of ways in which practical technical skills can be developed through curricula. Here the plan is to bridge the perceived technical competency gaps of students by providing training in employability enhancing technical subjects through mandatory one credit courses and additional training through optional courses. The courses focus on skill development and more than 50% of the time is spent on practical training and problem solving, to provide the requisite understanding towards application of academic topics from engineering disciplines into real world engineering projects.

The main objectives of the program are:

- To provide students an understanding of the expectations of industry.
- To improve employability skills of engineering students of MCET.
- To bridge the skill gaps and make students industry ready.
- To provide an opportunity to students to develop inter-disciplinary skills.

Since the individual capabilities, aptitudes and needs of students vary widely, and since only 30 hours is available during regular contact hours for such value added courses, a two-pronged strategy is proposed to achieve the objectives outlined above.

It is proposed to conduct one credit courses of 30 hours duration each semester for four semesters, as part of the curriculum. Every student should opt for a minimum of four one credit courses. No additional fees or charges will have to be paid by the students for these mandatory courses.
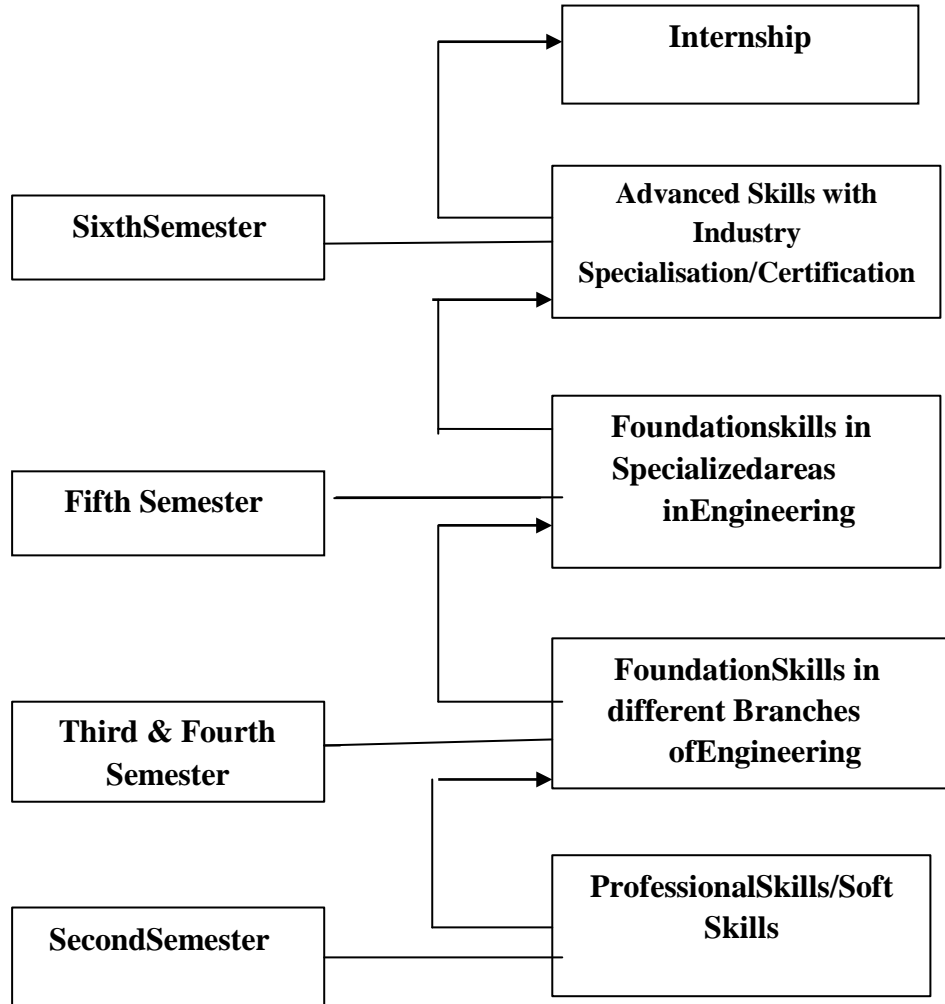
In addition to this, other **optional VAE courses** that will further improve the employability prospects of the students will be offered outside regular contact hours on optional basis, and interested students can join these courses by paying the fees fixed for it.

These courses will be offered as per clause 4.6 and 3.1.1 of UG and PG regulations respectively.

A VAE Course Management Committee shall be constituted for each stream, consisting of two HoDs from that stream as Stream Co-ordinator and Deputy Stream Co-ordinator respectively, the OCC Faculty Co-ordinator as Convener, the OCC Faculty Advisers of each Department under that stream and two student co-ordinators from each Department under that stream. This Committee shall meet atleast once every month to discuss the various issues related to Planning, Development and Conduct of OCC and VAE Courses of the concerned stream.

The scheme of assessment and distribution of marks for each course is decided by the course faculty, and the details shall be provided in the proposal for each course in the course design template. The system of evaluation shall normally be continuous internal assessment by the course faculty and there will be no end semester examination. An exam at the end of the course may be conducted by the course faculty, as proposed in the scheme of assessment for that course.

Framework for One Credit Courses (OCC)

	Internship
SixthSemester	**Advanced Skills with Industry Specialisation/Certification**
Fifth Semester	**Foundationskills in Specializedareas inEngineering**
Third & Fourth Semester	**FoundationSkills in different Branches ofEngineering**
SecondSemester	**ProfessionalSkills/Soft Skills**

Courses Offered & Syllabi - IT Stream (Odd Semesters)

Year/Semester	Course Code	Name of the Course
II/III	140IR5111	Practical approach of Problem solving Techniques
	140IR5112	Open source programming using Linux
	140ER5113	Fundamentals of MATLAB
III/V	11IR011	Programming Mobile Application for Android Handheld Systems
	11IR012	Cloud Computing
	11IR013	Java web Services
	11IR014	Perl Programming
	11IR015	Server side scripting using Python
	11IR016	Communication and Image processing using MATLAB
	11IR017	Embedded Programming using PIC Microcontrollers
	11IR018	Fundamentals of Networking

140IR5111 PRACTICAL APPROACH OF PROBLEM SOLVING TECHNIQUES

1. Title of the Course: Practical approach of Problem solving Techniques

2. Aim:

- To introduce necessary skills needed for a software Engineer.
- To introduce the importance of logical thinking for Problem solving
- To impart knowledge in problem-solving method for developing an algorithmic solution to a problem.
- To develop Flowchart using RAPTOR
- To apply the concepts to solve problem

1. **Prerequisites:**
   - Basic knowledge in Mathematics.
   - Basic knowledge in Programming.

2. **Course Outcomes:**
   At the end of the course, the students will be able to:
   - Articulate a problem including assumptions and definitions.
   - Identify and employ techniques for generating possible solutions.
   - Defend the choice of a solution against alternatives**.**

3. **Teaching Strategies:**

S.No	Description	Teaching Methods
1.	Introduction to Problem Solving	PPTs and Practices
2.	Algorithm development and Description	PPTs and Practices
3.	Flowchart – Implementation of algorithm	PPTs and Practices
4.	Programming Style and Efficiency	PPTs and Practices

4. **Syllabus:**

UNIT I   **10 hrs**

Software Engineer Skills – Problem – Solving a Problem: Understand the Problem, Formulate a Model, Develop an Algorithm, Write a Program, Test a Program, Evaluate the Solution. Problem Classification – Logic – Importance of Logic in Problem Solving- Types of Logic

UNIT II   **10 hrs**

Programming life cycle phases – problem solving – implementation – maintenance – pseudo code representation – flow charts - RAPTOR- algorithms – algorithmic efficiency – complexity of algorithms – Testing

Unit III   **10 hrs**

Arguments to main - Environment variables - Library functions getenv, putenv and the global variable environ –Recursion - Functions with a variable number of arguments - The library function system - The library macro assert -The library function perror and global variable errno - The atexit function - qsort, bsearch – Reallocation - Pointer to structures

Theory: 9 Hrs
Practical: 21 Hrs
Total: 30 Hrs

7.Course Plan:

No of Day	No. of Lecture Hrs	Content to Deliver	Remarks
1	2	Software Engineer Skills –Problem – Solving a Problem - Problem Classification – Logic – Importance of Logic in Problem Solving- Types of Logic	PPT
2	3	**Case Study: Different types of Computational Problem:** ATM System, Bill Processing System	PPT & Lab
3	2	**Case study:** **Solve the Problem**: Grading System **Logic:** Determine whether a given number is prime or not	PPT & Lab
4	2	Pseudo code - Properties of Algorithm- Patterns in Algorithm- Problem solving through Algorithms	PPT
5,6	5	**Case Study:** **Algorithm writing for different pattern of algorithms-** Grading System	PPT & Lab
7	2	Implementation of Algorithm using Flow Chart- RAPTOR - Problem solving through Flow chart	PPT
8	5	**Case Study:** **Raptor:** Grading System	PPT & Lab

9	3	Problem solving using a functional style - correctness issues in programming – Iterative Versus Recursive style- efficiency issues in programming - time and space measures - Testing	PPT
10	6	**Case Study:** Grading System	PPT & Lab

8. Course Assessment :

S. No	Description	Max. Marks
1.	Solving a Problem - Assignment	5
2.	Logic for a Problem - Preparation and Presentation	5
3.	Algorithm Development (Step wise Execution) - Description - Assignment	30
4.	Practical Test – Raptor	30
5.	Practical Test -Implementation and Testing	30
	Total (A)	100/2 = 50
	Problem solving Skill - Interview(B)	20
	Online Test	30
	Total Marks (A+B+C)	100

9. References:

1. Dormey R G. How to Solve it by Computers, PH 2005

2. Infosys Campus Connect Foundation Programme - Problem Solving Techniques

3. http://mitpress.mit.edu/sicp/full-text/book/book-Z-H-4.html

4. Byron S. Gottfried: Theory and Problems of Programming with C Language, Schaum Series, Tata Mcgraw Hill

10. Resources:
TURBO C, RAPTOR

140IR5112   OPEN SOURCE PROGRAMMING USING LINUX

1. Title of the Course: Open source programming using Linux

2. Aim:

To give introduction about basic file system and process commands in Linux operating systems.

3. Prerequisites:

- Basic knowledge in DOS and C programming

4. Course Outcomes:

At the end of the course, the students will be able to:
- Install Linux OS by partitioning the hard disk
- Manage files through file operation commands
- Control process through process commands

5. Teaching Strategies:

S.No	Description	Teaching Methods
1.	Linux introduction and file system	PPTs and Practices
2.	Commands for files and directories	PPTs and Practices
3.	Processes in linux	PPTs and Practices
4.	Shell programming	PPTs and Practices

6. Syllabus:

Unit I Introduction   **7 hours**

Linux introduction and file system–Basic features, advantages, installing requirement, basic architecture of UNIX/Linux system, Kernel, Shell.

Unit II Commands for Files and Directories   **8 hours**

Commands for files and directories cd, cp, mv, rm, mkdir,more, less, creating and viewing files, using cat, file comparisons, View files, disk related commands, checking disk free spaces, Essential linux commands.

Unit III   Processes in Linux   8 hours

Processes in linux –process fundamentals,connecting processes with pipes,Redirecting input output,manual help, Background processing, managing multiple processes, changing process priority, scheduling of processes , batch commands, kill, ps, who,sleep, Printing commands, grep, fgrep , find, sort, cal,banner, touch, file, file related commands–ws, sat, cut,grep, dd, etc.

Unit IV   Shell Programming   7 hours

Shell programming: Shell programming basic, various types of shell, shell programming in bash, conditional and looping statements, case statements, parameter passing and arguments, shell variables, shell keywords, creating simple shell programs .

Theory: 10 Hrs
Practical: 20 Hrs
Total: 30 Hrs

7. Course Plan:

No. of Hrs	Topic	Remarks
2	Basic features, advantages, installing requirement	PPT
3	basic architecture of UNIX/Linux system	PPT & Lab
2	Kernel, Shell.	PPT & Lab
2	cd, cp, mv, rm, mkdir ,, Essential linux commands.	PPT & Lab
2	creating and viewing files, using cat, file comparisons, View files,	PPT & Lab
3	disk related commands, checking disk free spaces	Lab
3	process fundamentals,connecting processes with pipes	PPT
3	Redirecting input output,manual help, Background processing	PPT
3	managing multiple processes, changing process priority,	PPT
1	Shell programming basic, various types of shell	PPT & Lab
2	shell programming in bash, conditional and looping statements, case statements	PPT & Lab

3	creating shell programs for automate system tasks and report printing	PPT & Lab
1	use of grep in shell, awk programming	PPT & Lab

8. Course Assessment

S. No	Description	Max. Marks
1.	Installing Linux – Lab Exercise	20
2.	Linux commands Presentation	20
3.	Test on Linux Commands	30
5.	Practical Test –Shell Programming	30
	Total (A)	100/2 = 50
	Problem solving Skill - Interview(B)	20
	Online Test	30
	Total Marks (A+B+C)	100

9. References :

1. Linux: The Complete Reference, Sixth Edition ,Richard Petersen , 2008
2. http://www.linux.org/lessons/beginner/

10. Resource Requirements:

- Linux OS

140IR5113   FUNDAMENTALS OF MATLAB

1.Title of the Course: Fundamentals of MATLAB

2.Aim :
        The aim of this course is to introduce the elements and practicalities of computer programming through the MATLAB mathematical computing environment.

1. **Prerequisites:**
   - Familiarity with Windows applications.
   - Basic Signals and their classifications.
   - Linear Algebra.

2. **Course Outcomes:**
After completing this course, the students will be able to use Matlab for analysis of circuits and systems.

3. **Teaching Strategies:**

S. No.	Description	Teaching Methods
1.	Overview of MATLAB	PPTs, Videos and programming Practices
2.	Programming in MATLAB	PPTs, Videos and programming Practices
4.	Functions	PPTs, Videos and programming Practices
5.	Animation and Sound in MATLAB	PPTs, Videos and programming Practices
6.	Simulink	PPTs, Videos and programming Practices

4. **Syllabus**

Unit I Overview of MATLAB   6

MATLAB Interactive Sessions - Menus and the Toolbar - Arrays, Files, and Plots - Script Files and he Editor/Debugger - The MATLAB Help System – Problem Solving Methodologies- One and Two Dimensional Numeric Arrays - Multidimensional Numeric Arrays- Element by Element perations-Matrix Operations - Polynomial Operations Using Arrays- Cell Arrays - Structure Arrays.

Unit II Programming in MATLAB   **6**

Program Design and Development - Relational Operators and Logical Variables – Logical Operators and Functions -Conditional Statements - for Loops - while Loops - The switch Structure- Debugging MATLAB Programs - Applications to Simulation.

Unit III   Functions   **6**

Elementary Mathematical Functions – User Defined Functions - Additional Function Topics -Working with Data Files- xy Plotting Functions - Additional Commands and Plot Types-Interactive Plotting in MATLAB – Three Dimensional Plots.

Unit IV   Animation and Sound in MATLAB   **6**
Creating Movies in MATLAB- Rotating 3D Surface- Animation with the Erase Mode Property- A Model of Sound-Creating Sound in MATLAB- Reading and Playing Sound Files.

Unit V Simulink   **6**
Introduction to Simulink - Linear State-Variable Models -Piecewise-Linear Models – Transfer Function Models- Nonlinear State-Variable Models – Subsystems- - Simulation of a Nonlinear system.

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Theory: 09 Hrs
Practical: 21 Hrs
Total: 30 Hrs

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5. **Course Plan**

S. No.	Content to Deliver	Hours
1	MATLAB Interactive Sessions - Menus and the Toolbar - Arrays, Files, and Plots	2
2	Script Files and the Editor/Debugger - The MATLAB Help System	1
3	Problem Solving Methodologies- One and Two Dimensional Numeric Arrays - Multidimensional Numeric Arrays	2
4	Element by Element Operations-Matrix Operations - Polynomial Operations Using Arrays- Cell Arrays - Structure Arrays.	2
5	Program Design and Development - Relational Operators and Logical Variables	2

6	Logical Operators and Functions- Conditional Statements	2
7	for loops - while loops - The switch Structure- Debugging MATLAB Programs	2
8	Applications to Simulation.	1
9	Elementary Mathematical Functions – User Defined Functions- Additional Function Topics- Working with Data Files	2
10	xy Plotting Functions - Additional Commands and Plot Types	2
11	Interactive Plotting in MATLAB – Three Dimensional Plots.	2
12	Creating Movies in MATLAB- Rotating 3D Surface	2
13	Animation with the Erase Mode Property	1
14	A Model of Sound-Creating Sound in MATLAB- Reading and Playing Sound Files.	2
15	Introduction to Simulink	1
16	Linear State-Variable Models -Piecewise- Linear Models	2
17	Transfer Function Models- Nonlinear State- Variable Models – Subsystems.	2

6. **Course Assessment:**

S.No	Assessment	Marks
1.	Assessment – 1 (Programming in MATLAB)	30
2.	Assessment – 2 (Functions and Plots)	40
3.	Assessment – 3 (Simulink)	30
	Total:	100

7. **References:**

- Essential MATLAB for scientists and engineers" by Brian D. Hahn, Arnold, 2001.
- MATLAB primer by Kermit Sigmon.
- www.mathworks.in/academia/student_center/tutorials/launchpad.html.
- Rudra Pratap "Getting Started with Matlab: A Quick Introduction for Scientists and Engineers" oxford university press 2010.
- Gilat "Matlab: An Introduction with Applications" Wiley India 2012.

10. **Resource Requirements:**

- PC with MATLAB Software Infrastructure required – Lab with projector facility.

11IR011   PROGRAMMING MOBILE APPLICATION FOR ANDROID HANDHELD SYSTEMS

1. Title of the Course: Programming Mobile Application for Android Handheld Systems

2. Aim:

- To introduce the concepts on mobile application development for the Android devices.

3. Prerequisites:

- Basic concepts of Object Oriented Programming and knowledge in XML Format

4. Course Outcomes :

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

- Develop Mobile Applications for Android Devices

5. Teaching Strategies:

S.No	Description	Teaching Methods
1.	**Android Devices**	PPTs and Practices
2.	**User Interface Design concepts**	PPTs and Practices
3.	**DB storage and Retrieval**	PPTs and Practices
4.	**APP Deployment**	PPTs and Practices

6.Syllabus:

Unit I Android Devices   **8 hours**

Introduction, Preparing IDE with Android Studio, Android System Architecture, Creating Project and Activities, Hello world Project

Unit II User Interface Design concepts   **8 hours**

User Interface Architecture, UI widgets, Notification and Toast, Menus, Dialogs, Lists, Location and Maps

Unit III DB storage and Retrieval   **8 hours**

Working with Data and Storage, SQLLite, MySql,SQL Server Connectivity, Creating Graphs and Charts

Unit IV APP Deployment   **6 hours**

Animation, Content Provider ,Network Services,Commication,Services ,Deploying App in PlayStore

Theory   : 10 Hrs
Practical : 20 Hrs
Total   : 30 Hrs

7.Course Plan:

No. of Hours	Topic	Remarks
2	Introduction to Android Development	Lab
3	Android Studio IDE deployment	Lab
3	User Interface and widgets	Lab
2	Notification and Toast	Lab
4	Menu, Dialogs, Lists	Lab
3	Location and Maps	Lab
4	Working with Data and Storage	Lab
3	Animation and Content Providers	Lab
3	Network Communication and Services	Lab
3	Publishing Your App	Lab

8.Course Assessment :

S. No	Description	Max. Marks
1.	Unit -1 Class Test	10
2.	Unit -2 Class Test	10
3.	Unit -3 Class Test	10
4.	Unit -4 Class Test	10
5.	Case Presentation and Submission	20
6.	Practical Lab Test – App Development	40
	Total (A)	100/2 = 50
	Problem solving Skill - Interview(B)	20
	Online Test(C)	30
	Total Marks (A+B+C)	100

9. References:

- Erik Hellman ,Android Programming: Pushing the Limits, Wiley Publication, 2014

- https://developer.android.com/training/index.html

10. Resource Requirements:
- SQL Server 2008 / MySQL

- Android Studio IDE and Genymotion Android Emulator or Android Mobile Phone

11IR012   CLOUD COMPUTING

1. **Title of the Course:** Cloud Computing

2. **Aim :**
    *   To introduce the fundamental concepts in the area of cloud and also impart knowledge in cloud computing applications.

3. **Prerequisites:**
    *   Basic knowledge in working principles of Distributed systems and computer networks.
    *   Basics concepts of Virtualization and cloud computing.

4. **Course Outcomes:**
    At the end of the course, the students will be able to:
    *   Understand the concept of virtualization and its types.
    *   Create and manage virtual machines.
    *   Develop cloud setup   using cloud tools.

5. **Teaching Strategies:**

S.No	Description	Teaching Methods
1.	Introduction to Virtualization	PPTs and Practice sessions
2.	Taxonomy of virtual machines	PPTs and Practice sessions
3.	Study of cloud setup tools	PPTs and Practice sessions
4.	Working with cloud tools.	PPTs and Practice sessions

6. **Syllabus**

Unit I: Introduction   **10 Hours**

Virtualization overview – Benefits – Need for virtualization – Limitations Traditional vs. Contemporary Virtualization - Pitfalls of virtualization, Hypervisors - Virtualization Considerations for Cloud Providers- Types of Virtualization

Unit II: Virtual Machine   10 Hours

Understanding virtual machines - Taxonomy of virtual machines – Life Cycle Process and System level virtual machines – Emulation –Binary Translation techniques – Managing storage for virtual machines - Virtualizing storage – Backup and recovery – Applications of virtual machines.

Unit III: Implementation   10   Hours

Building and managing Virtual machine – Xen Hypervisor and its Architecture – VMWare VSphere – Kernel Virtual Machine (KVM) Microsoft HyperV - Virtual Box - Eucalyptus - Nimbus - Open Nebula, CloudSim

Theory: 10 Hrs
Practical: 20 Hrs
Total: 30 Hrs

7.Course Plan:

No. of Hrs	Topics	Remarks
2	Introduction- Virtualization	PPT
3	Installation and accessing virtual host	PPT & Lab
3	Cloud providers and free tools	PPT & Lab
3	Types of virtualization	PPT & Lab
3	Life Cycle Process and System level virtual machines	PPT & Lab
3	Virtual sing storage – Backup and recovery virtual machine- Applications of virtual machines	Lab
3	Xen architecture	PPT
2	Assignment or quiz	PPT& Lab
3	VMware tool	PPT
2	Assignment	PPT & Lab
3	Nimbus, Open Nebula, CloudSim	PPT & Lab

8. Course Assessment

S. No	Description	Max. Marks
1.	Installation of VMware software and application access from virtual machine	5
2.	Developing applications in virtual machine	5
3.	Setting up a cloud	30
4.	Hosting applications in cloud	30
5.	Practical Test -Implementation and Testing the cloud	30
	Total (A)	100/2 = 50
	Problem solving Skill - Interview(B)	20
	Online Test	30
	Total Marks (A+B+C)	100

9. References:

1. Rajkumar Buyya, James Broberg, Andrzej Goscinski, " Cloud Computing Principles and Paradigms", John Wiley & Sons, 2011.
2. Matthew Portney, "Virtualization Essentials", John Wiley & Sons, 2012.
3. Tim Cerfing, Jeff Buller, Chuck Enstall, Richard Ruiz, "Mastering Microsoft Virtualization", Wiley Publication, 2010.
4. Venkata Josyula, Malcolm Orr, Greg Page, "Cloud Computing: Automating the Virtualized Data center", Cisco Press, 2012.
5. William Von Hagen, "Professional Xen Virtualization", Wiley Publication, 2008.
6. Cody Bunch, "Automating vSphere with VMware vCenter Orchestrator: Technology Handson", Pearson Educcation, 2012.

10.Resources Requirements:

- VM ware workstation, cloud-sim, Nimbus tools etc.

11IR013   JAVA WEB SERVICES

1.Title of the Course: Java web Services

2. Aim:
>   To introduce students to the Java programming language for the development of web pages

3. Prerequisites:
- Basic knowledge in java programming
- Knowledge of HTML is required.

4. Course Outcomes:
>   At the end of the course, the Students will be able to:
- Apply object-oriented programming concepts to develop basic web pages
- Develop a high degree of competence as a web developer by learning principles and techniques of client-side programming with HTML, CSS, and JavaScript.

5.Teaching Strategies:

S.No	Description	Teaching Methods
1.	Introduction to JFC and Swing	PPTs, Brainstorming and Practices
2.	JavaServer Pages Overview	PPTs, Questioning & Listening , Demos and Practices
3.	JDBC Fundamentals	PPTs, Demos and Practices

6.Syllabus:

UNIT-I   10 hrs
Introduction to JFC and Swing, Features of the Java Foundation Classes, Swing API Components, JComponent Class, Windows, Dialog Boxes, and Panels, Labels, Buttons, Check Boxes, Menus, Toolbars, Implementing Action interface, Pane, JScrollPane, Desktop pane, Scrollbars, Lists and Combo Boxes, Text-Entry Components, Colors and File Choosers, Tables and Trees, Printing with 2D API and Java Print Service API.

UNIT-II   10 hrs
Introduction, JavaServer Pages Overview, A First JavaServer Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries.

UNIT-III   10 hrs

Overview-Database and SQL Fundamentals - JDBC Fundamentals -Advanced JDBC - Introduction to Row Sets - JDBC Classes and the Java.SQL - Connecting To Databases - JDBC Design Patterns

Theory   : 8 Hours
Practical : 22 Hours
Total   : 30 Hours

7. Course Content:

No. of Lecture Hrs	Content to Deliver	Remarks
2	Introduction to JFC and Swing, Labels, Buttons, Check Boxes, Menus, Toolbars	PPT
3	Features of the Java Foundation Classes, Swing API Components	PPT & Lab
2	JComponent Class, Windows, Dialog Boxes, and Panels	PPT & Lab
3	Implementing Action interface	PPT & Lab
2	Introduction, JavaServer Pages Overview	PPT & Lab
3	A First JavaServer Page Example, Implicit Objects	Lab
2	Scripting, Standard Actions, Directives	PPT
3	Custom Tag Libraries	PPT
2	Overview-Database and SQL Fundamentals	PPT
3	JDBC Fundamentals -Advanced JDBC	PPT & Lab
2	Introduction to Row Sets - JDBC Classes and the Java.SQL	PPT & Lab
3	Connecting To Databases - JDBC Design Patterns	PPT & Lab

8. Course Assessment :

S. No	Description	Max. Marks
1.	Practical Test – Swing	20
2.	Practical Test – Java Server Pages	15
3.	Practical Test – JDBC	15
Total (A)		50
Aptitude Test(B)		10
Mini Project (C)		40
Total Marks (A+B+C)		100

9. References:

1. Ed Roman, "Mastering Enterprise Java Beans", Third Edition,John Wiley & Sons Inc., 2005

2. Hortsmann & Cornell, "CORE JAVA 2 ADVANCED FEATURES, VOL II", Pearson Education, 2008

10. Resource Requirements:

- JDK 1.7,Net beans 7.1,Eclipse

11IR014   PERL PROGRAMMING

1.Title of the Course: Perl Programming

2. Aim:

To introduce Perl programming language for building the data driven reporting and systems administration applications.

3. Prerequisites:

- Basic knowledge in java programming
- Knowledge of HTML is required.

4. Course Outcomes:

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

- Learn the fundamentals of the Perl programming language and how it can be used to write data reporting and systems administration applications.
- Discover how to use the DBI.pm module and related DBD (driver) files with Perl to build database-driven applications.

5.Teaching Strategies:

S.No	Description	Teaching Methods
1.	Introduction to Perl	PPTs, Brainstorming and Practices
2.	Subroutines and Object Oriented Perl	PPTs, Questioning & Listening, Demos and Practices
3.	CGI and CPAN	PPTs, Demos and Practices

6.Syllabus:

UNIT – I   **10 hrs**

Perl Basics: Main Perl Features – Similar Programming Languages – Working with simple values – Lists and Hashes - Loops and Decisions – Regular Expressions: Substitution – Delimiters – Modifiers – Split – Join – Transliteration.

UNIT – II   **10 hrs**

Files and Data: Writing to Files - Directories – References – Subroutines: Subroutines for Calculation – Recursion – Running and Debugging Perl – Modules – Object Oriented Perl: Writing with Objects – Constructors – Inheritance.

UNIT – III   **10 hrs**

Introduction to CGI: Writing CGI Scripts – CGI Environment – CPAN – Perl and Databases: Accessing Databases – Interacting with Databases – Sending E-mail Using Perl – Web Applications with Perl.

Theory   : 8 Hours
Practical : 22 Hours
Total   : 30 Hours

7.Course Plan:

No. of Hrs	Content to Deliver	Remarks
2	Perl Basics: Main Perl Features – Similar Programming Languages –- Loops and Decisions	PPT
3	Similar Programming Languages – Working with simple values	PPT & Lab
2	Working with simple values – Lists and Hashes	PPT & Lab
3	Regular Expressions: Substitution – Delimiters – Modifiers – Split – Join – Transliteration.	PPT & Lab
2	Files and Data: Writing to Files - Directories	PPT & Lab
3	Recursion – Running and Debugging Perl – Modules	Lab
2	Object Oriented Perl: Writing with Objects	PPT
3	Constructors – Inheritance	PPT
2	Introduction to CGI: Writing CGI Scripts – CGI Environment Interacting with Databases –	PPT
4	CPAN – Perl and Databases: Accessing Databases –	PPT & Lab
4	Sending E-mail Using Perl – Web Applications with Perl.	PPT & Lab

8.Course Assessment :

S. No	Description	Max. Marks
1.	Practical Test – Swing	20
2.	Practical Test – Java Server Pages	15
3.	Practical Test – JDBC	15
Total (A)		50
Aptitude Test(B)		10
Mini Project (C)		40
Total Marks (A+B+C)		100

9. References:

1. "Learning Perl" by Randal L. Schwartz, Sixth Edition, O'Reilly, 2011.
2. "Perl: Complete Reference" by Brown C Martin, Second Edition, Tata Mcgraw Hill, 2009.
3. "Beginning Perl" by Simon Cozens, First Edition, Wrox Press, 2000.
4. http://www.perl.org/books/beginning-perl

10.Resource Requirements:

- Padre, the Perl IDE

11IR015 SERVER SIDE SCRIPTING USING PYTHON

1. **Title of the Course:** Server side scripting using Python

2. **Aim :**
   - To Introduce python and its variables, expressions and programming constructs
   - To introduce various data structures in python
   - To introduce various input and output methods in python
   - To introduce exception handling techniques in python
   - To introduce python standard library

3. **Prerequisites:**
   - Object oriented programming.
   - Web programming.

4. **Course Outcomes:**

   At the end of the course, the students will be able to:
   - Apply object-oriented programming concepts to develop dynamic interactive Python applications.
   - Employ control structures, functions, and arrays to create Python programs.
   - Create an advanced project using MySQL, Python and a Model-View-Controller framework.
   - Use SQL commands and the MySQL database together with Python.

5. Teaching Strategies:

S.No	Description	Teaching Methods
1.	Introduction to Python	PPTs and Practices
2.	Data Structures	PPTs and Practices
3.	Modules, I/O	PPTs and Practices
4.	Exception Handling	PPTs and Practices

6. Syllabus:

UNIT – IIntroduction to Python   10 hrs
Introduction to Python – Installation – Python Interpreter – usage and customization – Editor
setup – Variables, Expressions and Statements – Conditionals – Functions.

UNIT – II   Data Structures   10 hrs
Strings – Lists – List Comprehensions – Stacks – Queues – Tuples – Sequences – Sets –
Dictionaries – Sets.

UNIT – III   Modules, I/O and Exception Handling   10 hrs
Modules – Search path – Compiled modules – Standard modules – Packages – Input and
Output functions – Files – read and write – Exception – Handling and Raising – User defined
Exceptions - Oops In Python- Python Standard Library

Theory: 10 Hrs
Practical: 20 Hrs
Total: 30 Hrs

7.Course Plan:

No of Day	No. of Lecture Hrs	Content to Deliver	Remarks
1	3	Introduction to Python – Installation – Python Interpreter	PPT & Lab
2	3	usage and customization – Editor setup – Variables, Expressions and Statements	PPT & Lab
3	3	Conditionals – Functions	PPT & Lab
4	3	Strings – Lists – List Comprehensions	Video,PPT & Lab
5	4	Stacks – Queues – Tuples	Video,PPT & Lab
6	3	Sequences – Sets – Dictionaries – Sets.	Video,PPT & Lab
7	3	Modules – Search path – Compiled modules- Standard modules	PPT
8	3	Packages – Input and Output functions	PPT & Lab
9	2	Files – read and write – Exception – Handling and Raising	PPT & Lab
10	3	User defined Exceptions - Oops In Python- Python Standard Library	PPT & Lab

8. Course Assessment :

S. No	Description	Max. Marks
1.	Programming constructs- Assignment	10
2.	Data Structures - Preparation and Presentation	20
3.	I/O &Exception handling - Preparation and Presentation	20
4.	Mini Project	50
	Total (A)	100/2 = 50
	Interview(B)	20
	Online Test	30
	Total Marks (A+B+C)	100

9. **References:**
   1. The Python Tutorial available at http://docs.python.org/3.3/tutorial/
   2. How to Think Like a Computer Scientist: Learning with Python (3nd edition) by: Peter Wentworth Jeffrey Elkner, Allen B. Downey, and Chris Meyers. Free Online Version: http://openbookproject.net/thinkcs/python/english3e/

10. **Resources Requirements:**
   Python IDE

11IR017   COMMUNICATION AND IMAGE PROCESSING USING MATLAB

1. Title of the Course: Communication and Image Processing using MATLAB

2.Aim:

The course will impart knowledge on performing various image processing tasks using the Image Processing Toolbox and implementing various analog and digital modulation schemes using the Communication System Toolbox.

3. Prerequisites:

- Familiarity with using Windows applications
- Fundamentals of MATLAB

4.Course Outcomes:

At the end of this course, the students will be able to:
- Work comfortably with various image processing tasks
- Implement various analog and digital modulation schemes
- Create simple GUIs

5.Teaching Strategies:

- Power point presentations
- Demonstrations
- Programming practices

6.Syllabus:

MODULE I: IMAGE PROCESSING
Introduction to Image Processing Toolbox, Image Import and Export, Image Types in the Toolbox - Converting Between Image Types, Process Multi-Frame Image Arrays, Reading Image Data, Writing Image Data to Files, Displaying and Exploring Images, Geometric Transformations.

MODULE II: COMMUNICATION SYSTEM
Introduction to Communication System Toolbox, Analog modulation – Amplitude and frequency modulation, Digital modulation – Amplitude, phase and frequency modulation, AM and FM using Simulink.

MODULE III: GUI
Creating a GUI – GUI for performing simple operations on an image –GUI for amplitude and frequency modulation.

7.Course Plan:

S. No	Content to Deliver	No. of Lecture Hrs
Module - I		
1.	Introduction to Image Processing Toolbox, Image Import and Export, Image Types in the Toolbox	1
2.	Converting Between Image Types, Process Multi-Frame Image Arrays	3
3.	Reading Image Data, Writing Image Data to Files, Displaying and Exploring Images	2
4.	Geometric Transformations	4
Module- II		
5.	Introduction to Communication System Toolbox, Analog modulation – Amplitude and frequency modulation	3
6.	Digital modulation – Amplitude, phase and frequency modulation	4
7.	AM and FM using Simulink	3
Module- III		
9.	Creating a GUI	4
10.	GUI for performing simple operations on an image	3
11.	GUI for amplitude and frequency modulation.	3

8.Course Assessment:

S. No	Description	Max. Marks
1.	**Assessment-I** Project Report and Presentation	20
2.	**Assessment-II** Design Test using different toolbox	30
	Total	50

9.References:

- MATLAB primer by Kermit Sigmon
- Digital Image Processing using MATLAB by Rafael Gonzalez, Richard Woods, Steven Eddins
- Digital Signal Processing Using MATLAB, Third Edition by Vinay K. Ingle, John G. Proakis
- www.mathworks.in/academia/student_center/tutorials/launchpad.html
- RudraPratap "Getting Started with Matlab: A Quick Introduction for Scientists and Engineers" oxford university press 2010

8. Resource Requirements:

- PC with MATLAB Software

11IR017   EMBEDDED PROGRAMMING USING PIC MICROCONTROLLERS

1. **Title of the Course:** Embedded Programming using PIC Microcontrollers.

2. **Aim:**

    To impart the basic knowledge in embedded programming principles, methodologies of embedded software development and its applications.

3. **Prerequisites :**

    Basics of Electronics Circuits, Microprocessor, Microcontroller and C-Programming.

4. **Course Outcomes:**

    At the end of the course, the students will be able to:
    - Understand the constraints in embedded software development and multitasking programming.
    - Gain experience with real time embedded system projects and working in a small team,cooperatingon various aspects of software development.
    - Understand the interfacing of digital and analog I/O devices.

5. **Teaching Strategies:**
    - Lecture
    - Lab work
    - Simulation
    - Project

6. **Syllabus:**

    UNIT-I   **10 Hrs**

    Microcontroller Hardware: Microcontroller architecture-signals-Operation features-Interrupts-Serial Communications-Memory Organization.

    UNIT-II   **10 Hrs**

    Embedded compiler: Introduction to embedded compilers- Introduction to Proteus.

    UNIT-III   **10 Hrs**

    Introduction To I/O Ports-Programming Using I/O Ports-Timers/Counters-Programming Using Timers/Counters-Serial Communication Interface-Analog to Digital I/O-Interfacing Simple Sensors-Keyboard Interfacing-Seven Segment Display-LCD Interfacing-Stepper Motor Interfacing-Dc Motor Interfacing- I^2C Bus Interfacing-RTC Interfacing-External EPROM Interfacing.

    Theory: 10 Hrs

    Practical : 20 Hrs

    Total : 30 Hrs

7. Course Plan:

Hrs	Lecture/Lab	Topic
1	Lecture	Microcontroller architecture
1	Lecture	Signals
1	Lecture	Operation features
1	Lecture	Interrupts
1	Lecture	Serial communication
1	Lecture	Memory organization
1	Lecture/Lab	Introduction to embedded compilers
1	Lecture/lab	Introduction to embedded compilers
1	Lecture/lab	Introduction to proteus
1	Lecture/lab	Introduction to I/O ports
1	Lecture	Programming using I/O ports
1	Lecture /lab	Timers/Counters
1	Lecture /lab	Programming using Timers /Counters
1	Lecture	Programming using Timers/Counters
1	Lecture/lab	Serial Communication Interface
1	Lecture/Lab	Serial Communication Interfacing
1	Lecture	Analog to Digital I/O
1	Lecture /lab	Interfacing simple sensors
1	Lecture /Lab	Interfacing simple sensors
1	Lecture	Key board interfacing
1	Lecture/Lab	7 Segment Display
1	Lecture/Lab	LCD interfacing
1	Lecture/Lab	Stepper Motor interfacing
1	Lecture/Lab	DC motor interfacing
1	Lecture /lab	DC motor interfacing

1	Lecture /lab	I2C bus interfacing
1	Lecture /Lab	RTC Interfacing
1	Lecture/lab	RTC Interfacing
1	Lecture	External EPROM interfacing
1	Lecture	External EPROM interfacing

8. **Course Assessment:**

- The following grading scheme will be used (* denotes group work):
- Homework: 20 Marks
- Regular Laboratory Exercises: 30 Marks
- Laboratory Project*: 50 Marks

9. **References:**

- Reference book is Embedded C Programming and the Microchip PIC by BARNETT.
- Design with PIC microcontrollers by John B.Peatman
- The 8051 Microcontroller and Embedded Systems Using Assembly and C by Mazidi. Pearson Education
- Web Resources/links www.microchip.com/pic
- Web Resources/links www.keil.com/uvision

10. **Resource Requirements:**

- Systems –PC's required as per the number of students
- Software Tools – Proteus, IAR Workbench and CCS Compiler

11IR018   FUNDAMENTALS OF NETWORKING

1. Title of the Course: Fundamentals of Networking

2.Aim:

- To impart knowledge in the basics of computer networking.

3.Prerequisites :

- Computer Networks, Basics of computer Hardware

4. Course Outcomes:

At the end of the course ,the students will
- Become familiar with layered communication architectures (OSI and TCP/IP).
- Develop practical Networking Knowledge and skills in professional environment.

5. Teaching Strategies:
- Lecture
- Lab work
- Simulation using Network Simulators
- Project Presentations

6. Syllabus:

Unit 1:   **6 Hrs**

Basic Networking Knowledge and Practice- Introduction to Networking Software-OPNET, Creating Hub, Switches and comparing the performance, Implementation of different Topologies-bus,star,ring.

Unit 2:   **6 Hrs**

LAN and Internet- Wired and Wireless, Design and Implementation of Switched LAN Networks, performance of different implementations of local area networks –small scale, medium scale applications.

Unit 3:   **6 Hrs**

Network Routing -IP addressing and sub netting, queuing discipline,Connection oriented and Connectionless services, Congestion Control Algorithms.

Unit 4:   **6 Hrs**

Introduction to Qualnet -Network Routing, Energy modeling, Security-Network Attacks, Encryption and Decryption.

Unit 5:   **6 Hrs**

Introduction to NS2 - Sample programs, wired and wireless network, post processing filters, analysis of network parameters-throughput, packet delivery ratio, end to end delay, jitter.

Theory   : 10 Hrs
Practical : 20 Hrs
Total   : 30 Hrs

7. Course Plan:

Hours	Lecture/Lab	Topic
1.	Lecture	Introduction-Basics of Computer Network
2.		Basic Hardware Components , network topology, Introduction to Networking Software- Riverbed Modeler Academic Edition Software Installation Procedure and obtaining License.
3.		
4.	Lecture /lab	Simulating Bus, Ring Topologies. Creating Hub ,Switches and comparing the performance of pure hub LAN with switched LAN in a network.
5.		
6.		
7.	Lecture/Lab	Design and Implementation of Switched LAN Networks, small scale, medium scale applications.
8.		
9.		
10.	Lecture/lab	RIP, Network Routing -IP addressing and subnetting,queuingdiscipline, Demonstration of the congestion control algorithms implemented by theTransmission Control Protocol (TCP)
11.		
12.		
13.	Lecture/lab	Wireless Networks-MANET,Wireless Sensor Networks
14.		
15.		
16.	Lecture/Lab	Introduction to Networking Software-Qualnet, Network Routing, Energymodeling.
17.		
18.		
19.	Lecture /Lab	Security-Network Attacks, Encryption and Decryption.Creating Scenario and introducing attack. Analyzing the performance of the network with and without attack
20.		
21.		
22.	Lecture/Lab	Introduction to NS2- Sample programs, wired network, analysis of network parameters
23.		
24.		
25.	Lecture /Lab	Wireless networks, post processing, parameter analysis.
26.		
27.		
28.	Lecture/Lab	Project development - Interaction within the group ,Write/compile document for presentation
29.		
30.		

8. Course Assessment:

- Project presentation.

Criteria	Marks
Presentation	20
Project Complexity	20
Originality	10
Total	**50**

9. References :

- Andrew S. Tanenbaum, "Computer Networks", 4th ed., Prentice Hall, 2003.
- William Stallings, "Data and Computer Communications," 5th edition, PHI, 2005
- OPNET Technologies, "IT Guru Quick Start" (PowerPoint Presentation), from OPNET Training Manual, (OPNET Technologies,Inc, 2004).
- http://www.cs.binghamton.edu/~vinkolar/qualnet/QualNetTutorial.pdf
- http://www.isi.edu/nsnam/ns/doc/ns_doc.pdf

10. Resource Requirements:

- Systems –PC's required as per the number of students.
- Software Tools – Qualnet,Riverbed Modeler Academic Edition,NS2.

Courses Offered & Syllabi - IT Stream (Even Semesters)

Year/Semester	Course Code	Name of the Course
II/IV	140IR5114	PHP and MySQL
	140IR5115	C & C++ Coding standards
	140IR5116	Basics of LabVIEW
III/VI	11IR019	Business Intelligence and Data Analytics (BIDA)
	11IR020	Mobile Application Development
	11IR021	Programming Refinement Logic
	11ER022	Speech and Audio Signal Processing using MATLAB

140IR5114   PHP AND MYSQL

1.Title of the Course: PHP and MySQL

2. Aim:

To create database-driven websites using PHP and MySQL.

3. Prerequisites:

- Basic knowledge in HTML.
- Moderate knowledge in C programming.
- Basic knowledge in Database concepts.

4. Course Outcomes:

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

- To create dynamic interactive pages with PHP.
- To manipulate and manage database data with PHP
- To manipulate files and validate forms with PHP.

5. Teaching Strategies:

S.No	Description	Teaching Methods
1.	Introduction to Basic PHP Syntax	PPTs
2.	PHP Variables	PPTs and Practices
3.	PHP Operators	PPTs and Practices
4.	Array Manipulation Functions	PPTs and Practices
5.	Reusing Code and Writing Functions	PPTs and Practices

6.Syllabus:

Unit I: Introduction   **8 Hrs**

Open source-PHP – history- features-variables- statements- operators-conditional statements-if-switch-nesting conditions-merging forms with conditional statements-loops-while-do-for – loop iteration with break and continue.

Unit II: Arrays and Functions: **7Hrs**

Arrays: Creating an array- modifying array-processing array-grouping form with arrays- using array functions- creating user defined functions- using files- sessions-cookies- executing external programs- Creating sample applications using PHP.

Unit III: Effectiveness of MySQL   **8 Hrs**

MySQL Tools-Prerequisites for MySQL connection- Databases and tables- MySQL data types-Creating and manipulating tables- Insertion, updation and deletion of rows in tables -Retrieving data- Sorting and filtering retrieved data.

Unit IV: PHP with MySQL: **7Hrs**

Working MySQL with PHP-database connectivity- usage of MYSQL commands in PHP, processing result sets of queries- handling errors-debugging and diagnostic functions.

Theory: 10 Hrs
Practical: 20 Hrs
Total: 30 Hrs

7.Course plan:

No. of Hours	Content to Deliver	Remarks
2	Open source-PHP Fundamentals – Applications.	PPT (Class Room)
1	statements- operators	PPT (Class Room)
2	conditional statements-if-switch-nesting conditions	PPT (Class Room)
1	merging forms with conditional statements-loops	PPT (Class Room)
2	while-do-for – loop iteration with break and continue	Lab
1	Arrays: Creating an array- modifying array	Lab
2	processing array-grouping form with arrays	Lab
1	creating user defined functions- using files-sessions- cookies	Lab
1	cookies- executing external programs	Lab
1	Creating sample applications using PHP	PPT (Class Room)

2	MySQL Tools-Prerequisites for MySQL connection	PPT (Class Room)
2	MySQL data types-Creating and manipulating tables	Lab
2	Insertion, updating and deletion of rows in tables	Lab
3	Retrieving data- Sorting and filtering retrieved data.	Lab
2	Working MySQL with PHP-database connectivity	Lab
1	Aptitude Test	Class Room
4	Mini Project	Lab

8.Course Assessment :

S. No	Description	Max. Marks
1.	Practical Test – arrays in PHP	20
2.	Practical Test – functions in PHP	20
3.	Practical Test – authenticate users with PHP	20
4.	Practical Test – use SQL to output reports with MySQL	20
5.	Practical Test – dynamic interactive pages with PHP	20
	Total (A)	100/2 = 50
	Aptitude Test(B)	20
	Mini Project (C)	30
	Total Marks (A+B+C)	100

9. References:

1. http://www.headfirstlabs.com/books/hfphp/
2. W. Jason Gilmore, "Beginning PHP and MySQL", 4th Edition, Apress, 2010.

10.Resource Requirements:

- Netbeans IDE 7.4
- Wamp server

140IR5115   C & C++ CODING STANDARDS

1. **Title of the Course :** C & C++ Coding standards

2. Aim:

To learn the advanced concepts of C, C++ and data structures

3. Prerequisites:

*   Basic knowledge in programming

4. Course Outcomes:

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

*   Design any application based file concept
*   Develop the real life applications

5. **Teaching Strategies:**

S.No	Description	Teaching Methods
1.	Program files	PPTs, Brainstorming and Practices
2.	Expression and statements	PPTs, Questioning & Listening , Demos and Practices
3.	Standard Template Library	PPTs, Demos and Practices

6. **Syllabus:**

UNITI :   10 hrs
File Naming conventions, Program files, header files, comments, declarations, function declarations, prototypes, simple statements, compound statements, operators, macros, conditional compilation, debugging

UNIT II: 10 hrs
Sequence Control: Implicit and Explicit sequence control, sequence control with within expression and statements, recursive sub programs, exception handling, co routines, Scheduled sub programs, concurrent execution. Data control referencing environments, static and dynamic scope, local data referencing environment.

UNIT III: 10 hrs

Linked Lists – Single and Doubly linked list – Dynamic Memory allocation – Stack- Queue –Standard Template Library – Components – Vector- List- Set- Map- Accumulate –Function Objects – Adaptors.Streams - Streams classes - Stream Errors, Disk File I/O with streams, - file pointers - Error handling in file I/O with member function - Overloading the extraction and insertion operators - Memory as a stream object - Command line arguments, and printer output.

7. Course Content:

No of Day	No. of Lecture Hrs	Content to Deliver	Remarks
1	2	File Naming conventions, Program files, prototypes, ,	PPT
2	3	Header files, comments, declarations, function declarations	PPT & Lab
3	2	simple statements, compound statements	PPT & Lab
4	3	operators, macros, conditional compilation, debugging	PPT & Lab
5	3	Sequence Control: Implicit and Explicit sequence control, sequence control with within expression and statements	PPT & Lab
6	2	recursive sub programs, exception handling, co routines	Lab
7	3	Scheduled sub programs, concurrent execution	PPT
8	2	Data control referencing environments, static and dynamic scope	PPT
9	2	Error handling in file I/O with member function	PPT
10	3	Overloading the extraction and insertion operators	PPT & Lab
11	2	Memory as a stream object	PPT & Lab
12	3	Command line arguments, and printer output	PPT & Lab

8. Course Assessment :

S. No	Description	Max. Marks
1.	Practical Test – File Naming conventions	20
2.	Practical Test – Sequence Control	15
3.	Practical Test – Memory allocation	15
Total (A)		50
Mini Project (B)		50
Total Marks (A+B)		100

9.

References:

1. Herb Sutter,"C++ Coding Standards: 101 Rules, Guidelines, and Best Practices",
Addison-Wesley,2004.

2. Herb Sutter, "Exceptional C++: 47 Engineering Puzzles, Programming Problems,
and Solutions", Addison-Wesley,1999.

10. Resource Requirements:

- Turbo C

140IR5116   BASICS OF LABVIEW

1. **Title of the Course :** Basics of Lab VIEW

2. **Aim:**

    This course prepares the students to develop test and measurement, data acquisition, instrument control, data logging, and measurement analysis applications using LabVIEW.

3. **Prerequisites:**

    Basic Programming Skills in C

4. **Course Outcomes:**

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

    - Understand front panels, block diagrams, icons, and connector panes
    - Create user interfaces with charts, graphs and buttons
    - Use the programming structures and data types that exist in LabVIEW
    - Use various editing and debugging techniques
    - Create and save VIs for use as subVIs
    - Display and log data
    - Create applications that use data acquisition (DAQ) devices
    - Create applications that use GPIB and serial port instruments
    - Use the state machine design pattern in various applications
    - Use local variables to modify front panel controls or stop parallel loops

5. **Teaching Strategies:**

S.No	Description	Teaching Methods
1.	LabVIEW programming Concepts	PPTs and Videos
2.	LabVIEW programming Examples and Exercises	Practicals

6. **Syllabus:**

UNIT I: 10 hrs

Data and Data Types in general programming- LabVIEW Basics: Front Panel, Block Diagram, Icon and Connector, control, function and Tools Palette- Front Panel controls-subVI

UNIT II: 10 hrs

Data Flow programming, Parallelism- Block Diagram functions: Numeric, String, Boolean, Comparison- Structure: For, While, Event Structure, Flat and Sequence Structure, Timing functions.

UNIT III: 10 hrs

Array and Cluster- Charts and Graphs- Property Node and Invoke Node-File IO-Synchronization-Introduction to DAQ.

Theory : **4 Hrs**
Practical : **26 Hrs**
Total : **30 Hrs**

7. **Course Plan:**

Hours	Topic	Remarks
1hr	Data and Data Types in general programming	PPT & Lab
2 hrs	LabVIEW Basics: Front Panel, Block Diagram, Icon and Connector, control, function and Tools Palette.	PPT & Lab
1 hr	FP controls.	PPT & Lab
1 hr	Data Flow programming, Parallelism.	PPT & Lab
1 hr	BD functions: Numeric, String, Boolean, Comparison	PPT & Lab
6 hrs	Structure: For, While, Event Structure, Flat and Sequence Structure, Timing functions.	PPT & Lab
3 hrs	Array and Cluster	PPT & Lab
3 hrs	Charts and Graphs	PPT & Lab
3 hrs	Property Node and Invoke Node.	PPT & Lab
3 hrs	File IO	PPT & Lab
3 hrs	Synchronization	PPT & Lab
3 hrs	DAQ	PPT & Lab

8. Course Assessment:

S. No	Description	Max. Marks
1.	Programming Assignments	25
2.	Practical Test at the end of the Course	25
	Total Marks	50

9. References:

a. Gary W Johnson, Richard Jennings, 'LabVIEW Graphical Programming' Fourth Edition, McGraw Hill, 2006.
b. Robert H Bishop. 'Learning with LabVIEW 2009' Pearson Education, 2010.
c. http://www.forums.ni.com

10. Resource Requirements:

- Lab VIEW Software

11IR019   BUSINESS INTELLIGENCE AND DATA ANALYTICS (BIDA)

1.Title of the Course: Business Intelligence and Data Analytics (BIDA)

2. Aim:

- To introduce the concepts of Business Intelligence including the processes, methodologies, infrastructure, and current practices used to transform business data into useful information and support business decision-making.

3. Prerequisites:

- Basic knowledge in Database Management System ,SQL and Excel Charts and Reports.

4. Course Outcomes:
   At the end of the course, the students will be able to
- apply concepts like OLTP,OLAP, SQLand Data Warehousing in various business contexts using leading BI Tools such as Tableau or Panorama Necto

5.Teaching Strategies:

S.No	Description	Teaching Methods
1.	**Management Information System**	PPTs and Practices
2.	**Advanced DBMS concepts**	PPTs and Practices
3.	**ERP**	PPTs and Practices
4.	**Data Visualization**	PPTs and Practices

6.Syllabus:

Unit I Management Information System   6 hours

       Introduction– Components, Levels of information requirements, Transaction Processing, Enterprise Resource Planning System, Decision Support System

Unit II Advanced DBMS   concepts   6 hours

    Database Management System, Database Design for OLTP, Data Warehousing, Data Marts, Dimension Modeling, Database Design for OLAP, Data Security and User Access

Unit III   ERP   8 hours

    Enterprise Resource Planning, Business Scorecard, Key Performance Indicators

Unit IV   Data Visualization   10 hours

    Data Visualization using Tableau BI, Predictive Analytics, Emerging Trend in BI

Theory   : 10 Hrs
Practical : 20 Hrs
Total   : 30 Hrs

7.Course plan:

No. of Hours	Topic	Remarks
3	Management Information System-ERP system	Lab
3	Decision Support System	Lab
2	Online Transaction Processing (OLTP)	
2	Online Analytical Processing (OLAP)	Lab
3	Relational databases and models and SQL	Lab
3	Data warehouses and data marts	Lab
2	Dimensional modeling	Lab
2	Data security and privacy	Lab
2	Business performance management, including	Lab
2	Key performance indicators and operational metrics	Lab
2	Balanced scorecard	Lab
2	Dashboards, Data visualization,	Lab
2	Emerging trends in BI	Lab

8.Course Assessment :

S. No	Description	Max. Marks
1.	Unit -1 Class Test	10
2.	Unit -2 Class Test	10
3.	Unit -3 Class Test	10
4.	Case Presentation and Submission	20
5.	Practical Lab Test – Data Visualization	50
	Total (A)	100/2 = 50
	Problem solving Skill - Interview(B)	20
	Online Test(C)	30
	Total Marks (A+B+C)	100

9. References:

1. Business Intelligence: A Managerial Approach (2011) Turban, Sharda,Delen, King, Publisher: Prentice Hall, Edition: 2nd, ISBN: 13-978-0-136-10066-9.
2. Management Information Systems: Managing the Digital Firm(2009) Laudon Kennath C, Jane P, Prentice Hall, Eleventh Edition

3. http://www.tableau.com/learn/training
4. http://www.panorama.com/resources/resource-library/
5. https://en.wikipedia.org/wiki/Business_intelligence

10. Resource Requirements:

- SQL Server 2008
- SQL Analysis and Integration Services with Tableau 9.0 / Panorama Necto 15.0
- Desktop BI Tool

1. **Title of the Course:** MOBILE APPLICATION DEVELOPMENT

2. **Aim :**

    To impart knowledge about developing the interactive apps for windows mobile environment.

3. **Prerequisites:**
    - Basic programming knowledge in C++ and C#

4. **Course Outcomes:**

    At the end of the course, the students will be able to,
    - Design a mobile application
    - Create a web application along with multimedia effects

5. **Teaching Strategies:**

S.No	Description	Teaching Methods
1.	Introduction and Programming in C#	PPTs, and simple programs
2.	Designing using XAML	PPTs, Videos and Programming
3.	Windows 8 App Development Using Templates	Videos and designing
4.	Implementing in Windows Store	Videos and demonstration

6. **Syllabus:**

Unit I Introduction and Programming in C#   **10 Hrs**

Introduction- Windows 8 Installation- Visual Studio Installation- Windows 8 App Lifecycle- Programming in C# - Classes and Methods- Constructors- Access Specifiers- Namespaces- Exception Handling

Unit II XAML   **10Hrs**

XAML Basics – Adding Controls- Properties- Events- Layouts- Message Dialogue- Designing using C# with XAML

Unit III App Development   **10 Hrs**

 Templates- Grid App- Split App- Web View- User Control- Settings Panel- Navigation- App Bar- Project Solution – Packages- Creating App Package- Publishing App.

Theory   : 10 Hrs
Practical : 20 Hrs
Total   : 30 Hrs

7. Course Plan :

No. of Hrs	Topic	Remarks
2	Introduction- Windows 8 Installation- V.S installation- Windows 8 App Lifecycle	PPT
2	Programming in C# - Classes and Methods	PPT & Lab
2	Controlling Programmatic Flow; Manipulating Types and Strings	PPT & Lab
2	Constructors- Access Specifiers	PPT & Lab
2	Namespaces- Exception Handling	PPT & Lab
2	XAML Basics	PPT & Lab
2	Adding Controls- Properties	PPT & Lab
2	Layouts	PPT & Lab
2	Events	PPT & Lab
2	Message Dialogue- Designing using C# with XAML	PPT & Lab
2	Templates- Grid App	PPT & Lab
3	Split App- Web View- User Control	PPT & Lab
2	Settings Panel- Navigation- App Bar- project	PPT & Lab
3	Project Solution – Package .appxmanifest- Creating App Package- Publishing App	PPT & Lab

8. Course Assessment :

S. No	Description	Max. Marks
1.	Sample App development	50
2.	Assignment on controls in XAML	
3.	Mini Project	50
	Total (A)	100

9. References:

1. http://www.tutorialspoint.com/csharp/csharp_quick_guide.htm
2. Adam Nathan, "Windows Presentation Foundation-Unleased", XAML Developer Reference –O'Reilly Media.
3. http://msdn.microsoft.com/en-us/library/windows/apps

10. Resource Requirements :

- Windows 8.1, Visual Studio 2013

11IR021   **PROGRAMMING REFINEMENT LOGIC**

1. **Title of the Course:** Programming Refinement Logic

2. **Aim :**
   - To introduce necessary skills needed for a software Engineer
   - To gain knowledge on imperative paradigms
   - To apply the concepts to solve problem
   - To impart knowledge on network based programs

3. **Prerequisites:**
   a. Basic knowledge in Java programming
   b. Basics of Network concepts

4. **Course Outcomes:**
   At the end of the course, the students will be able to:
   - Apply coding styles to develop an error free program
   - Develop an effective graphical user interface
   - Develop a real time project using client server architecture
   - Analyze the given problem and solve by using appropriate techniques

5. **Teaching Strategies:**

S.No	Description	Teaching Methods
1.	**INTRODUCTION**	PPTs and Practices
2.	**IMPERATIVE PARADIGMS**	PPTs and Practices
3.	**GRAPHICAL USER INTERFACES**:	Videos, PPTs and Practices

6. **Syllabus:**

Unit I INTRODUCTION   **8 Hrs**

Design Style, coding style, functions and operators.

Unit II IMPERATIVE PARADIGMS   **12 Hrs**

Lexical Tokens, Identifiers, Class Fundamentals ,Object & Object reference, Object Life time & Garbage Collection, Creating and Operating Objects, Constructor & initialization code block, Access Control, Modifiers, methods, Nested , Inner Class &Anonymous Classes, Abstract Class & Interfaces.

Unit III GRAPHICAL USER INTERFACES **10 Hrs**

Designing Graphical User Interfaces, Components and Containers, Basics of Components, Using Containers, Layout Managers, AWT Components, Event Types & Classes, Networking Programming, Client-Server Architecture, Socket Overview, Networking Classes and Interfaces, Network Protocols.

Theory : 10 Hrs
Practical : 20 Hrs
Total : 30 Hrs

7. Course Plan:

No. of Hrs	Content to Deliver	Remarks
2	Design Style	PPT & Lab
2	coding style	PPT & Lab
2	functions	PPT & Lab
2	operators	PPT & Lab
3	Lexical Tokens, Identifiers, Class Fundamentals ,Object & Object reference, Object Life time & Garbage Collection	PPT & Lab
3	Creating and Operating Objects, Constructor & initialization code block, Access Control, Modifiers	PPT & Lab
3	methods, Nested , Inner Class &Anonymous Classes,	PPT
3	Abstract Class & Interfaces.	PPT & Lab
2	Designing Graphical User Interfaces, Components and Containers, Basics of Components, Using Containers, Layout Managers	Lab
4	AWT Components, Event Types & Classes, Networking Programming	PPT & Lab
4	Client-Server Architecture, Socket Overview, Networking Classes and Interfaces, Network Protocols	PPT & Lab

8.Course Assessment :

S. No	Description	Max. Marks
1.	Solving a Problem, Logic for a Problem, Algorithm Development, Choosing appropriate concepts for solving the problem	50
2.	Practical Test - Imperative paradigms	
3.	Practical Test - graphical user interfaces	50
	Total (A)	100

9. References:

- http://www.tutorialspoint.com/java/
- http://academy.javacodegeeks.com/course/advanced-java/
- Herbert Schildt, Java The Complete Reference, Seventh Edition: The Complete Reference, Seventh Edition
- Raymond Gallardo, Scott Hommel, Sowmya Kannan, Joni Gordon, Sharon Biocca Zakhour, The Java Tutorial: A Short Course on the Basics ,sixth edition

10. Resources Requirements :

- Netbeans IDE

11ER022   SPEECH AND AUDIO SIGNAL PROCESSING USING MATLAB

1. Title of the Course: Speech and Audio Signal Processing using MATLAB

2. Aim:

- To provides an insight into the nature of speech and audio signals, exploring the different parameters associated with short-time analysis of speech signals and learning the effects of filtering audio signals.

3.Prerequisites:

The student must have knowledge on
- Basics of signals
- Basics of MATLAB
- Knowledge on filters may be preferable

4.Course Outcomes:

At the end of this course, students will be able to:
- Understand the need for all the basic preprocessing tasks associated with speech signals and perform the same efficiently.
- Extract various parameters related to speech signals
- Understand filtering concepts and companding techniques

5.Teaching Strategies:

- Power point presentations
- Practical demonstrations
- Programming and simulation

6.Syllabus:

Unit I: MATLAB   Overview   10 Hrs
        Introduction, Introduction to signals- stationary and non-stationary signals, Introduction to speech signals-speech production mechanism-import and export speech signals- sampling frequency-short-time analysis- framing and windowing.

Unit II: MATLAB Parameters   12 Hrs
        Short-time parameters- short-time energy- zero crossing rate- short-time auto correlation, silence removal using short-time parameters, noise removal.

Unit III: MATLAB Filtering   8 Hrs
        Effect of filtering audio signals, Companding techniques- A-law and µ-law
companding.

Theory   :10 Hrs
Practical : 20 Hrs
Total   : 30 Hrs

7.Course Plan:

Hours	Topic	Remarks
Module I		
3	Introduction to MATLAB, Introduction to signals	PPT & Lab
1	Stationary and non-stationary signals	PPT & Lab
2	Introduction to speech signals-speech production mechanism	PPT & Lab
1	Import and export speech signals- sampling frequency	PPT & Lab
3	Short-time analysis- framing and windowing.	PPT & Lab
Module II		
2	Short-time parameters- short-time energy	PPT & Lab
2	Zero crossing rate	PPT & Lab
2	Short-time auto correlation	PPT & Lab
3	Silence removal using short-time parameters	PPT & Lab
3	Noise removal	PPT & Lab
Module III		
3	Effect of filtering audio signals	PPT & Lab
3	Companding techniques- A-law companding	PPT & Lab
2	µ-law companding	PPT & Lab

8.Course Assessment :

S. No	Description	Max. Marks
1.	**Assessment-I** Course Report	20
2.	**Assessment-II** Design Test	30
	TOTAL	50

9.References:

- ➢ Introduction to Digital Speech Processing, Lawrence R. Rabiner, Ronald W. Schafer
- ➢ Digital Processing of Speech Signals, Lawrence R. Rabiner
- ➢ http://iitg.vlab.co.in/?sub=59&brch=164

10. Resource Requirements:

- • MATLAB, Gol