

## Core Course CC-301 Open Source Operating System

### Course Introduction:

The course provides the knowledge of the Ubuntu Linux Operating System. This course intends to teach various features that will help the students to use and learn the working of Ubuntu operating system.

### Objectives:

The student would be able

- 1) To obtain knowledge of how to manage files in Linux system.
- 2) To understand Linux commands and write shell programming.
- 3) To grasp the concepts of User Management in Linux.
- 4) To control the system running Ubuntu operating system.

**No. of Credits:** 3

**Theory Sessions per week:** 4

**Teaching Hours:** 40 hours

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
<b>1</b>	<b>Introduction To Linux and Getting Started with Ubuntu</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Introduction to Linux</b> <ul style="list-style-type: none"> <li>○ What is Linux?</li> <li>○ The age of Linux</li> <li>○ The problems with Windows</li> <li>○ The benefits of Linux</li> <li>○ The realities of Running Linux                             <ul style="list-style-type: none"> <li>▪ Learning to use Linux</li> <li>▪ Who uses Linux?</li> <li>▪ Getting hold of Linux</li> <li>▪ Using Ubuntu</li> </ul> </li> <li>○ Booting Ubuntu for the first time                             <ul style="list-style-type: none"> <li>▪ Starting up</li> <li>▪ Logging in</li> </ul> </li> <li>○ Exploring the desktop                             <ul style="list-style-type: none"> <li>▪ First impressions</li> <li>▪ Desktop elements</li> <li>▪ Quick desktop guides</li> </ul> </li> <li>○ Working with virtual desktops</li> </ul> </li> </ul>	5 hrs
	<ul style="list-style-type: none"> <li>• <b>Getting Everything up and running</b> <ul style="list-style-type: none"> <li>○ Viewing your hardware</li> <li>○ Getting online                             <ul style="list-style-type: none"> <li>▪ Using an Ethernet Card</li> <li>▪ Joining wireless network</li> </ul> </li> <li>○ Configuring Email and instant messaging</li> </ul> </li> </ul>	5 hrs

	<ul style="list-style-type: none"> <li>○ Adding a Printer <ul style="list-style-type: none"> <li>▪ Configuring a local printer</li> <li>▪ Configuring a network printer</li> <li>▪ Configuring a windows/SMB shared printer</li> </ul> </li> <li>○ Setting up digital imaging devices <ul style="list-style-type: none"> <li>▪ Transferring photos from digital camera</li> <li>▪ Configuring scanner</li> </ul> </li> <li>○ Configuring Bluetooth</li> <li>○ Configuring sound cards</li> </ul>	
<b>2</b>	<b>Securing computer using Ubuntu and personalizing Ubuntu</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• Securing Computer <ul style="list-style-type: none"> <li>○ Windows security vs. Linux Security</li> <li>○ Root and ordinary users</li> <li>○ Personalizing Ubuntu</li> <li>○ Changing the look and feel <ul style="list-style-type: none"> <li>▪ Altering the theme</li> <li>▪ Changing individual theme components</li> <li>▪ Changing the wallpaper</li> </ul> </li> <li>○ Configuring input devices <ul style="list-style-type: none"> <li>▪ Configuring mouse options</li> <li>▪ Changing keyboard settings and shortcuts</li> </ul> </li> <li>○ Personalizing login details</li> <li>○ Changing login picture</li> </ul> </li> </ul>	5 hrs
	<ul style="list-style-type: none"> <li>• <b>Personalizing Ubuntu</b> <ul style="list-style-type: none"> <li>○ Adding and removing desktop items</li> <li>○ Adding shortcut <ul style="list-style-type: none"> <li>▪ Creating a shortcut</li> <li>▪ Creating a link</li> </ul> </li> <li>○ Adding and removing menus <ul style="list-style-type: none"> <li>▪ Adding all menus to a panel</li> <li>▪ Adding the applications menu to a panel</li> <li>▪ Deleting a menu</li> </ul> </li> <li>○ Setting power saving features</li> </ul> </li> </ul>	5 hrs
<b>3</b>	<b>Managing File</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Understanding file system concept</b> <ul style="list-style-type: none"> <li>○ Drive references</li> <li>○ Case sensitivity</li> <li>○ File access and storage</li> <li>○ Using Nautilus <ul style="list-style-type: none"> <li>▪ Menu bar</li> <li>▪ Toolbar</li> <li>▪ Location bar</li> <li>▪ Zoom controls</li> <li>▪ View as icons/list</li> </ul> </li> </ul> </li> </ul>	5 hrs

	<ul style="list-style-type: none"> <li>▪ Places pane</li> <li>○ Launching files and running programs</li> <li>○ Accessing removable storage devices <ul style="list-style-type: none"> <li>▪ Ejecting media from drives</li> </ul> </li> <li>○ Introducing the Bash Shell</li> <li>○ What is the Bash Shell?</li> <li>○ Getting started with shell <ul style="list-style-type: none"> <li>▪ Running programs</li> <li>▪ Running the shell via a virtual console</li> <li>▪ Getting help</li> </ul> </li> <li>○ Working with files <ul style="list-style-type: none"> <li>▪ Listing files</li> <li>▪ Copying files</li> <li>▪ Moving files</li> <li>▪ Deleting files</li> <li>▪ Changing and creating directories</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Understanding Linux files and users</b> <ul style="list-style-type: none"> <li>○ Real files and virtual files</li> <li>○ Users and file permissions <ul style="list-style-type: none"> <li>▪ Viewing permissions</li> <li>▪ Altering permissions</li> </ul> </li> <li>○ The file system explained</li> <li>○ Mounting <ul style="list-style-type: none"> <li>▪ Using the mount command</li> <li>▪ Mounting a Drive manually</li> <li>▪ Removing a mounted system</li> </ul> </li> <li>○ File Searches <ul style="list-style-type: none"> <li>▪ Using the find command</li> <li>▪ Using the locate command</li> </ul> </li> <li>○ Using whereis command</li> </ul> </li> </ul>	5 hrs
<b>4</b>	<b>Working with Text files, controlling the system, Multimedia</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Viewing the text files</b> <ul style="list-style-type: none"> <li>○ Using the cat command</li> <li>○ Using the less command</li> <li>○ Using the head and tail commands</li> <li>○ Using a command line text editor <ul style="list-style-type: none"> <li>▪ Understanding vi modes</li> <li>▪ Using vi to edit the file</li> <li>▪ Creating a new text file using vi</li> </ul> </li> <li>○ Searching through files <ul style="list-style-type: none"> <li>▪ Using grep to find text</li> <li>▪ Using regular expressions</li> </ul> </li> <li>○ Comparing text files</li> <li>○ Viewing the processes</li> <li>○ Controlling processes</li> </ul> </li> </ul>	7 hrs

	<ul style="list-style-type: none"> <li>▪ Killing processes</li> <li>▪ Controlling zombie processes</li> <li>▪ Using other commands to control processes</li> <li>○ Controlling jobs</li> <li>○ Piping and directing output <ul style="list-style-type: none"> <li>▪ Piping the outputs of commands</li> <li>▪ Redirecting output</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Multimedia</b> <ul style="list-style-type: none"> <li>○ Digital Music <ul style="list-style-type: none"> <li>▪ Playing the music files</li> <li>▪ Listening to audio cds</li> </ul> </li> <li>○ Movies and multimedia <ul style="list-style-type: none"> <li>▪ Watching videos</li> <li>▪ Installing codecs</li> <li>▪ Installing real player</li> <li>▪ Player Back video</li> </ul> </li> <li>○ Image Editing <ul style="list-style-type: none"> <li>▪ Introducing the GIMP</li> </ul> </li> <li>○ Editing images with the GIMP <ul style="list-style-type: none"> <li>▪ Making color corrections</li> <li>▪ Cropping and cloning</li> <li>▪ Sharpening</li> </ul> </li> <li>○ Applying filters</li> </ul> </li> </ul>	3 hrs

**Note: Topics are according to Ubuntu version 10.04.**

**Textbooks:**

1. Beginning with Ubuntu Linux (First Edition 2007)  
Publisher: Apress Publications  
By Keir Thomas
  
2. Unix : Concepts and Applications (Fourth Edition)  
Publisher: Tata McGraw Hill  
By Sumitabha Das

**Reference Books:**

1. Unix Shell Programming  
Publisher: BPB Publications  
By Yashvant P Kanetkar
  
2. The Official Ubuntu Book  
Publisher: Pearson Publications  
By Benjamin Mako Hill

3. Linux Command Line and Shell Scripting Bible  
Publisher: Wiley Indian Edition.  
By Richard Blum
  
4. Introduction to Unix/Linux  
Publisher: Cengage Learning  
By Christopher Diaz
  
5. Introduction to UNIX and Shell Programming  
Publisher: Pearson Education  
By M.G. Venkateshmurthy

## Core Course

### CC-302 Advanced Visual and Windows Programming

#### Course Introduction:

The course would make students acquainted with the advanced features of VB.NET programming language which will include database controls, .NET classes, crystal report, and object-oriented methods.

#### Objectives:

The student would be able

- 1) To learn the advanced concepts of the Microsoft Visual Basic.Net Programming language.
- 2) To implement application design specifications with a visual object-oriented, event-driven programming language.
- 3) To understand ADO.NET
- 4) To use classes, objects, and methods to properly modularize Visual Basic.NET programs.
- 5) To develop programs incorporating the use of strings, Date Time and sequential file access.

**No. of Credits:** 3

**Theory Sessions per week:** 4

**Teaching Hours:** 40 hours

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
<b>1</b>	<b>Object Oriented Programming</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Basic Skills for creating and using classes</b> <ul style="list-style-type: none"> <li>○ Add a class file to project</li> <li>○ Define properties</li> <li>○ Define methods</li> <li>○ Create and use an object</li> </ul> </li> <li>• <b>Basic skills for creating and using your own shared members</b> <ul style="list-style-type: none"> <li>○ Create and use shared properties and methods</li> <li>○ When to use shared properties and methods</li> </ul> </li> <li>• <b>Explore classes</b> <ul style="list-style-type: none"> <li>○ Use the class view window</li> <li>○ Use the object browser</li> </ul> </li> </ul>	4 hrs
	<ul style="list-style-type: none"> <li>• <b>To define and use Constructors</b></li> <li>• <b>Overload methods</b></li> </ul>	2 hrs
	<ul style="list-style-type: none"> <li>• <b>Introduction to Inheritance</b> <ul style="list-style-type: none"> <li>○ Create a base class</li> <li>○ Create a derived class</li> </ul> </li> </ul>	2 hrs
	<ul style="list-style-type: none"> <li>• <b>To use Structured Exception Handling</b> <ul style="list-style-type: none"> <li>○ To code Try-Catch-Finally Statements</li> </ul> </li> </ul>	2 hrs

	<ul style="list-style-type: none"> <li>○ To catch specific exception classes</li> <li>○ To use the throw statement</li> </ul>	
<b>2</b>	<b>Advanced Controls in VB.NET</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Scrollbar</b> <ul style="list-style-type: none"> <li>○ SmallChange</li> <li>○ LargeChange</li> <li>○ Value</li> <li>○ Minimum</li> <li>○ Maximum</li> </ul> </li> <li>• <b>Trackbar</b> <ul style="list-style-type: none"> <li>○ SmallChange</li> <li>○ LargeChange</li> <li>○ TickFrequency</li> <li>○ Minimum</li> <li>○ Maximum</li> </ul> </li> <li>• <b>Timer</b> <ul style="list-style-type: none"> <li>○ Interval</li> </ul> </li> <li>• <b>DateTimePicker</b> <ul style="list-style-type: none"> <li>○ Name</li> <li>○ CalendarFont</li> <li>○ CalendarForeColor</li> <li>○ Checked</li> <li>○ Enabled</li> <li>○ Format</li> <li>○ MaxDate</li> <li>○ MinDate</li> <li>○ ShowCheckBox</li> <li>○ ShowUpDown</li> <li>○ Value</li> <li>○ Visible</li> </ul> </li> <li>• <b>Calender</b> <ul style="list-style-type: none"> <li>○ SelectedDate</li> <li>○ SelectedDates</li> <li>○ DayStyle</li> <li>○ DayHeaderStyle</li> <li>○ NextPrevStyle</li> <li>○ OtherMonthDayStyle</li> <li>○ SelectedDayStyle</li> <li>○ SelectorStyle</li> <li>○ TitleStyle</li> <li>○ TodayDayStyle</li> <li>○ WeekendDayStyle</li> </ul> </li> </ul>	10 hrs

	<ul style="list-style-type: none"> <li>• <b>ImageList</b></li> <li>• <b>RichTextBox</b> <ul style="list-style-type: none"> <li>○ SelectedText</li> <li>○ SelectedRTF</li> <li>○ SelectionStart</li> <li>○ SelectionLength</li> <li>○ SelectionFont</li> <li>○ SelectionColor</li> <li>○ SelectionIndent</li> <li>○ SelectionRightIndent</li> <li>○ SelectionHangingIndent</li> <li>○ RightMargin</li> <li>○ SelectionBullet</li> <li>○ BulletIndent</li> </ul> </li> <li>• <b><u>TreeView</u></b> <ul style="list-style-type: none"> <li>○ CheckBoxes</li> <li>○ FullRowSelect</li> <li>○ HideSelection</li> <li>○ HotTracking</li> <li>○ Indent</li> <li>○ ShowLines</li> <li>○ ShowPlusMinus</li> <li>○ ShowRootLines</li> <li>○ Sorted</li> <li>○ Text</li> <li>○ TopNode</li> <li>○ VisibleCount</li> </ul> </li> </ul>	
<b>3</b>	<b>Basic Framework Classes</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Work with dates and times</b> <ul style="list-style-type: none"> <li>○ To get the current date and time</li> <li>○ To format DateTime values</li> <li>○ To get information about dates and times</li> <li>○ To perform operations on dates and times</li> <li>○ To work with dates and times</li> </ul> </li> <li>• <b>To work with strings</b> <ul style="list-style-type: none"> <li>○ To use the stringbuilder class for working with strings</li> <li>○ Other ways to work with strings</li> </ul> </li> <li>• <b>Format numbers, dates and times</b> <ul style="list-style-type: none"> <li>○ To format numbers</li> <li>○ To format date and time</li> </ul> </li> <li>• <b>Work with collections</b></li> </ul>	10 hrs



	<ul style="list-style-type: none"> <li>○ To use the collection class</li> <li>○ To use the ArrayList Class</li> <li>● <b>An Introduction to System.IO classes</b> <ul style="list-style-type: none"> <li>○ The classes for managing directories, Files</li> <li>○ How Files and Streams work</li> <li>○ To use the FileStream Class</li> </ul> </li> <li>● <b>To use the System.IO classes for Binary Files</b></li> <li>● <b>To use the System.IO classes for Text Files</b></li> <li>● <b>To use XML with Files</b> <ul style="list-style-type: none"> <li>○ An introduction to XML</li> <li>○ XML tags, declarations, comments, elements and attributes</li> <li>○ To work with an XML document in Visual Studio</li> <li>○ To use XML text classes</li> </ul> </li> <li>● <b>Work with structures</b> <ul style="list-style-type: none"> <li>○ To declare a structure</li> <li>○ To use a structure</li> </ul> </li> </ul>	
<b>4</b>	<b>Developing a DataBase Application with ADO.NET</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>● <b>An Introduction to ADO.NET</b></li> <li>● <b>To use the DataAdapter configuration wizard</b></li> <li>● <b>To work with a DataSet</b></li> <li>● <b>To use a DataGrid Control with a DataSet</b></li> <li>● <b>Other skills for working with ADO.NET objects</b></li> </ul>	7 hrs
	<ul style="list-style-type: none"> <li>● <b>Introduction to Crystal Report</b> <ul style="list-style-type: none"> <li>○ Creating Crystal Reports</li> </ul> </li> </ul>	3 hrs

**Note:** These topics can be covered using any version of .NET framework and Visual Studio. Therefore, there will be NO restriction in using the version available with the institute. Topics which are not available in Textbook should be covered from reference book.

**Textbook:**

Murach's Beginning Visual Basic .NET  
 Publisher : BPB Publication  
 By Anne Prince

**Reference Books:**

1. Mastering Visual Basic.Net  
 Publisher: BPB Publication  
 By Evangelos Petroutsos

2. Programming in Visual Basic .NET  
Publisher: Mc Graw Hill  
By Julia Case Bradley and Anita C. Millspaugh

## Core Course

### CC- 303 Data Communication and Networking

#### Course Introduction:

This course will introduce students to the fundamentals of data and computer communications. It provides the student with a conceptual foundation for the study of data communications and networking. The students will be exposed to communication principles, different types of media, modulation techniques, multiplexing, error detection and correction, switched networks, TCP/IP suite, cellular communication, fiber-optic communications and the state-of-art networking applications. It also reviews the current events in the field of communications so that the student has a sound knowledge in today's competitive environment.

#### Objectives:

The student would be able

- 1) To become familiar with the fundamentals of data communication and networking.
- 2) To understand different network technologies.
- 3) To get insights into different advanced network technologies that can be used to connect different networks.

**No. of Credits:** 3

**Theory Sessions per week:** 4

**Teaching Hours:** 40 hours

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
<b>1</b>	<b>Introduction to Data communications and Networking</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Fundamental concepts</li> <li>• Data communications</li> <li>• Protocols</li> <li>• Standards</li> <li>• Signal propagation</li> <li>• Analog and digital signals</li> <li>• Bandwidth of a signal and a medium</li> </ul>	3 hrs
	<b>Analog and Digital transmission</b>	
	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Analog signal, Analog transmission</li> <li>• Digital signal, Digital transmission</li> <li>• Digital signal, Analog transmission</li> <li>• Baud rate and bits per second</li> <li>• Analog signal, Digital transmission (excluding: Adaptive and Delta modulation)</li> </ul>	4 hrs

	<b>Modes of data transmission</b>	
	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Parallel and Serial communication</li> <li>• Asynchronous, Synchronous communication</li> <li>• Simplex, half duplex and full-duplex communication</li> </ul>	3 hrs
<b>2</b>	<b>Multiplexing and Demultiplexing</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• Multiplexing and Demultiplexing</li> <li>• Types of multiplexing</li> <li>• FDM versus TDM</li> <li>• WDM</li> </ul>	5 hrs
	<b>Transmission errors: Detection and correction</b>	
	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Error classification</li> <li>• Types of Error</li> <li>• Error Detection (Checksum, VRC, LRC, CRC)</li> <li>• Recovery from errors</li> </ul>	5 hrs
<b>3</b>	<b>Transmission Media</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Guided media <ul style="list-style-type: none"> <li>○ Twisted pair</li> <li>○ Coaxial cable</li> <li>○ Optical fiber</li> </ul> </li> <li>• Unguided media <ul style="list-style-type: none"> <li>○ Microwave</li> <li>○ Satellite communication</li> <li>○ Cellular telephones</li> </ul> </li> </ul>	5 hrs
	<b>Network topologies and Switching</b>	
	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Topologies <ul style="list-style-type: none"> <li>○ Mesh</li> <li>○ Star</li> <li>○ Tree</li> <li>○ Ring</li> <li>○ Bus</li> <li>○ Hybrid</li> </ul> </li> <li>• Basics of switching</li> <li>• Types of switching <ul style="list-style-type: none"> <li>○ Circuit</li> <li>○ Packet</li> <li>○ Message</li> </ul> </li> </ul>	5 hrs
<b>4</b>	<b>Network protocols, OSI, TCP/IP model</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Protocols in computer communications</li> <li>• OSI model and layer functions</li> <li>• TCP/IP <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ TCP/IP basics</li> </ul> </li> </ul>	4 hrs

	<p><b>LAN and WAN</b></p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• LAN</li> <li>• Ethernet <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Properties of Ethernet</li> <li>○ CSMA/CD</li> </ul> </li> <li>• Introduction to VLAN, Fast and Gigabit Ethernet</li> <li>• Token ring <ul style="list-style-type: none"> <li>○ Basics of Token ring</li> </ul> </li> <li>• FDDI <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Properties</li> <li>○ Operation</li> <li>○ Self healing mechanism</li> </ul> </li> <li>• Introduction to WAN</li> </ul>	4 hrs
	<p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>• ISDN, Architecture, Channel types, interfaces</li> <li>• Bluetooth</li> <li>• Infrared communication</li> <li>• Wireless LAN</li> <li>• Internetworking devices <ul style="list-style-type: none"> <li>○ Repeaters</li> <li>○ Bridges</li> <li>○ Routers</li> <li>○ Gateway</li> </ul> </li> </ul> <p><b>Note: Overview of the above topics should be covered</b></p>	2 hrs

**Textbook:**

Data Communications and Networks, 2<sup>nd</sup> Edition  
Publisher: McGraw Hill  
By Achyut S Godbole, Atul Kahate

**Reference Books:**

1. Business data communication  
Publisher: Cengage publications  
By Selly Cashman
  
2. Data communications and networking  
Publisher: McGraw Hill  
By Behrouz Forouzan
  
3. Computer networks  
Publisher: Pearson  
By Andrew S. Tanenbaum

## Core Course CC-304 \*CC-301 Practical

### Course Introduction:

The students using the concepts of filters, special commands in Linux operating system will be able to write efficient shell scripts. It also gives information about process management and communication commands.

### Objectives:

The student would be able

- 1) To get knowledge about managing files in Linux system.
- 2) To understand the use of common Linux editors to edit files and manage the contents of the file.
- 3) To learn commands of Linux for manipulating and filtering the contents of the file.
- 4) To develop the skills for writing shell scripts using files and filters.
- 5) To obtain knowledge about compressing files and communication commands.

**No. of Credits:** 3

**Practical Sessions per week:** 3

**Teaching Hours:** 40 hours

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
1	<b>General –Purpose Utilities and Files and directories</b> <ul style="list-style-type: none"> <li>• <b>General Purpose Utilities</b> <ul style="list-style-type: none"> <li>○ cal</li> <li>○ date</li> <li>○ echo</li> <li>○ bc</li> <li>○ script</li> <li>○ who</li> <li>○ uname</li> <li>○ tty</li> <li>○ man</li> <li>○ info</li> <li>○ passwd</li> <li>○ logout</li> <li>○ wc</li> </ul> </li> <li>• <b>Linux Files and Directories</b> <ul style="list-style-type: none"> <li>○ Current Working Directory- pwd</li> <li>○ Listing Files and Directories-ls</li> <li>○ Matching Filenames with Patterns.(wildcard characters)</li> <li>○ Simple Simple ways to create a file- touch, cat,</li> <li>○ echo</li> </ul> </li> </ul>	10 hours

	<ul style="list-style-type: none"> <li>○ Showing the contents of a file-cat, more, less,</li> <li>○ head,</li> <li>○ tail</li> </ul>	
<b>2</b>	<p><b>Additional File Management Commands</b></p> <ul style="list-style-type: none"> <li>• <b>Additional File Management Commands</b> <ul style="list-style-type: none"> <li>○ Creating Directories- mkdir</li> <li>○ Removing Empty Directories- rmdir</li> <li>○ Copying Files and Directories- cp</li> <li>○ Removing Files and Nonempty Directories- rm</li> <li>○ Renaming Files and Directories- mv</li> <li>○ Comparing Two Files- cmp</li> <li>○ What is Common- comm</li> <li>○ Converting One File to Other- diff</li> <li>○ Piping and Redirection and tee</li> <li>○ File and Directory Permission and Privileges chmod <ul style="list-style-type: none"> <li>○ Locating Files-find</li> </ul> </li> </ul> </li> <li>• <b>Editing Files</b> <ul style="list-style-type: none"> <li>○ Creating and Editing files using vi, pico and emacs editors.</li> </ul> </li> <li>• <b>Basics of Shell Scripting Programming</b> <ul style="list-style-type: none"> <li>○ Creating Shell Scripts using various commands of Linux except Filters.</li> <li>○ Interactive shell script using read and echo</li> <li>○ Decision Statements <ul style="list-style-type: none"> <li>▪ if then fi</li> <li>▪ if then else fi</li> <li>▪ if then elif else fi</li> <li>▪ case esac</li> </ul> </li> <li>○ Test command</li> <li>○ Logical Operators</li> <li>○ Looping statements <ul style="list-style-type: none"> <li>▪ for loop</li> <li>▪ while loop</li> <li>▪ until loop</li> </ul> </li> <li>○ Break, continue command</li> <li>○ Arithmetic in Shell script using expr</li> <li>○ Creating Shell Scripts to perform mathematical calculations</li> </ul> </li> </ul>	<b>10 hours</b>
<b>3</b>	<p><b>Simple Filters, filters using regular expression, advanced filters</b></p> <ul style="list-style-type: none"> <li>• <b>Simple Filters</b> <ul style="list-style-type: none"> <li>○ Paginating files - pr</li> <li>○ Splitting a file vertically –cut</li> <li>○ Pasting files- paste</li> <li>○ Ordering a file-sort</li> <li>○ Locate repeated and non repeated lines-uniq</li> <li>○ Translating characters –tr</li> </ul> </li> </ul>	<b>10 hours</b>

	<ul style="list-style-type: none"> <li>• <b>Filters using regular expression</b> <ul style="list-style-type: none"> <li>○ Searching for pattern-grep, stream editor – sed</li> </ul> </li> <li>• <b>Advanced filters</b> <ul style="list-style-type: none"> <li>○ Simple awk filtering</li> <li>○ Comparison operators</li> <li>○ Variables</li> <li>○ Built in variables</li> <li>○ Control flow</li> <li>○ Looping</li> </ul> </li> </ul>	
<b>4</b>	<b>Compressing , decompressing and achieving files &amp; Customizing environment variables , communication commands</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• Compressing , decompressing and achieving files <ul style="list-style-type: none"> <li>○ Gzip, gunzip</li> <li>○ Tar</li> <li>○ Zip and unzip</li> </ul> </li> <li>• <b>Environment variables</b> <ul style="list-style-type: none"> <li>○ Environment variables</li> <li>○ Alias</li> <li>○ Inline command editing</li> <li>○ Miscellaneous features</li> <li>○ Initialization script</li> </ul> </li> <li>• <b>Communication commands</b> <ul style="list-style-type: none"> <li>○ Finger</li> <li>○ Talk</li> <li>○ Mesg</li> <li>○ Mailx</li> <li>○ Pine</li> <li>○ Write</li> <li>○ Wall</li> </ul> </li> </ul>	

**Note:**

The students are expected to write shell scripts unit wise as given below.

The list in each unit is indicative only and **may or may not be asked in the examination.**

<b>List of shell scripts file based on</b>	
1	Check the output of the following commands:date, ls, who, cal, ps, wc, cat, uname, pwd, mkdir, rmdir, cd, cp, rm, mv, diff, chmod, grep, sed, head, tail,cut, paste, sort, find, man
2	Write a script to find the complete path for any file.
3	Write a shell script to execute following commands <ol style="list-style-type: none"> <li>1. Sort file abc.txt and save this sorted file in xyz.txt</li> <li>2. Give an example of : To execute commands together without affecting result of each other.</li> <li>3. How to print “this is a three –line 1. Text message”</li> <li>4. Which command display version of the UNIX?</li> <li>5. How would u get online help of cat command?</li> </ol>



4	<p>Write a shell script to execute following commands</p> <ol style="list-style-type: none"> <li>1. How would u display the hidden files?</li> <li>2. How delete directory with files?</li> <li>3. How would user can do interactive copying?</li> <li>4. How would user can do interactive deletion of files?</li> <li>5. Explain two functionality of “mv” command with example?</li> </ol>
5	<p>Write a shell script to execute following commands</p> <ol style="list-style-type: none"> <li>1. Create a file called text and store name,age and address in it.</li> <li>2. Display the contents of the file text on the screen.</li> <li>3. Delete the directories mydir and newdir at one shot.</li> <li>4. Sort a numeric file?</li> <li>5. Change the permissions for the file newtext to 666.</li> </ol>
6	Write shell script that accept filename and displays last modification time if file exists, otherwise display appropriate message.
7	Write a shell script to display the login names that begin with ‘s’.
8	Write a shell script to remove the zero sized file from the current directory
9	Write a shell script to display the name of all the executable file from the current directory.
10	Write a shell script that will display welcome message according to time
11	Write a shell script to find number of ordinary files and directory files.
12	<p>Write a shell script that takes a filename from the command line and checks whether the file is an ordinary file or not.</p> <ul style="list-style-type: none"> <li>▪ If it is an ordinary file then it should display the contents of the file.</li> <li>▪ If it is not an ordinary file then script should display the message: “ File does not exist or is not ordinary, cannot display. “</li> </ul>
13	<p>Write a shell script that takes a filename from the user and checks whether it is a directory file or not.</p> <ul style="list-style-type: none"> <li>▪ If it is a directory, then the script should display the contents of the directory.</li> <li>▪ If it is not a directory file then script should display the message: “File is not a directory file “</li> </ul>
14	<p>Write a shell script that takes a filename as an argument and checks if the file exists and is executable.</p> <ul style="list-style-type: none"> <li>▪ If the file is executable then the shell script should display the message: “File exists”</li> <li>▪ If the file does not exists and is not executable then the script should display the message: “File does not exist or is not executable.”</li> </ul>
15	Write a shell script that displays all subdirectories in current working directory.
16	Write a shell script that calculates the number of ordinary and directory files in your current working directory.
17	Write a shell script that accepts 2 filenames and checks if both exists; if both exist then append the content of the second file into the first file.
18	<p>Write a shell script that takes the name of two files as arguments and performs the following:</p> <ol style="list-style-type: none"> <li>i. Displays the message : “Displaying the contents of file :( first argument)”</li> </ol>

	<p>and displays the contents page wise.</p> <p>ii. Copies the contents of the first argument to second argument.</p> <p>iii. Finally displays the message : “File copied successfully.”</p>
19	<p>Write a shell script to display the following menu and acts accordingly:</p> <p>i. Calendar of the current month and year.</p> <p>ii. Display “Good Morning/Good Afternoon/Good Evening” according to the current login time.</p> <p>iii. User name, Users home directory.</p> <p>iv. Terminal name, Terminal type.</p> <p>v. Machine name.</p> <p>vi. No. of users who are currently logged in; List of users who are currently logged in.</p>
20	<p>Write a shell script that displays the following menu and acts accordingly</p> <ol style="list-style-type: none"> <li>1. Concatenates two strings</li> <li>2. Renames a file</li> <li>3. Deletes a file.</li> <li>4. Copy the file to specific location</li> </ol>
21	<p>Write a shell script to change the suffix of all your *.txt files to .dat.</p>
22	<p>Write a shell script to accept a directory-name and display its contents. If input is not given then HOME directory's contents should be listed. (Make use of command line argument)</p>
23	<p>Write a shell script to get all files of home directory and rename them if their names start with c.</p> <p>Newname = oldname111</p>
24	<p>Write a shell script that takes two filename as arguments. It should check whether the contents of two files are same or not, if they are same then second file should be deleted.</p>
25	<p>Write a shell script that accepts two directory names from the command line and copies all the files of one directory to another. The script should do the following</p> <ul style="list-style-type: none"> <li>▪ If the source directory does not exist, flash a error message</li> <li>▪ If destination directory does not exist create it</li> <li>▪ Once both exist copy all the files from source directory to destination directory.</li> </ul>
26	<p>Write a shell script that displays the following menu</p> <ul style="list-style-type: none"> <li>▪ List home directory</li> <li>▪ Date</li> <li>▪ Print working directory</li> <li>▪ Users logged in</li> </ul> <p>Read the proper choice. Execute corresponding command. Check for invalid choice.</p>
27	<p>Write a shell script that displays all hidden files in current directory.</p>
28	<p>Write a shell script that Combine two files in the third file horizontally and vertically.</p>
29	<p>Write a shell script to delete all the spaces from a given file.</p>
30	<p>Write a shell script to find a given date fall on a weekday or a weekend.</p>
31	<p>Write a shell script to search for a given word in all the files given as the arguments on the command line.</p>
32	<p>Write a shell script that display last modified file in the current directory.</p>

33	Write a script to display the permissions of the particular file.
34	Write a shell script to display the calendar in the following manner: i. Display the calendar of months m1 and m2 by 'CAL m1, m2' command file. ii. Display the calendar of the months from m1 to m2 by 'CAL m1-m2' command file.
35	Write a shell script to display the following menu for a particular file : i. Display all the words of a file in ascending order. ii. Display a file in descending order. iii. Toggle all the characters in the file. iv. Display type of the file.
36	Write a shell script to check whether the named user is currently logged in or not.
37	Write a shell script to display the following menu for a particular file: i. Display all the words of a file in ascending order. ii. Display a file in descending order. iii. Display a file in reverse order. iv. Toggle all the characters in the file v. Display type of the file.
38	Write a shell script to find total no. Of users and finds out how many of them are currently logged in.
39	Write a shell script that displays the directory information in the following format- <b>Filename      Size      Date      Protection      Owner</b>
40	Write a shell script to display five largest files from the current directory
41	Write a shell script that toggles contents of the file
42	Write a shell script that report whether your friend has currently logged in or not. If he has logged in then the shell script should send a message to his terminal suggesting a dinner tonight. If you do not have write permission to his terminal or if he hasn't logged in then such a message should be mailed to him about your dinner proposal.
43	Write a shell script for the performing the write and mail.
44	Write a shell script to accept any character using command line and list all the files starting with that character in the current directory.
45	Create a file called student containing roll-no, name and marks. a. Display the contents of the file sorted by marks in descending order b. Display the names of students in alphabetical order ignoring the case. c. Display students according to their roll nos. d. Sort file according to the second field and save it to file 'names'. e. Display the list of students who scored between 70 and 80.

**Note: Shell Script based on Files and filters should only to be asked in exam**

**Textbooks:**

1. Beginning with Ubuntu Linux (First Edition 2007)  
Publisher : Apress Publications  
By Keir Thomas
2. Unix : Concepts and Applications (Fourth Edition)  
Publisher: Tata McGraw Hill  
By Sumitabha Das

## Reference Books:

1. Unix Shell Programming  
Publisher : BPB Publications  
By Yashvant P Kanetkar
2. The Official Ubuntu Book  
Publisher : Pearson Publications  
By Benjamin Mako Hill
3. Linux Command Line and Shell Scripting Bible-  
Publisher : Wiley Indian Edition.  
By Richard Blum
4. Introduction to Unix/Linux  
Publisher: Cengage Learning  
By Christopher Diaz
5. Introduction to UNIX and Shell Programming  
Publisher: Pearson Education  
By M.G. Venkateshmurthy

**Core Course**  
**CC-305 \*CC-302 Practical**

**Course Introduction:**

Students will be provided with practical knowledge of vb.net programming language which includes object-oriented concepts, ADO.NET, file handling, inbuilt .net framework classes, advanced framework controls etc.

**Objectives:**

The students would be able

- 1) To get in-depth practical knowledge of vb.net programming.
- 2) To understand practical knowledge of programming in real-life application.
- 3) To explore the use of the Crystal Reports capabilities.

**No. of Credits:** 3

**Practical Sessions per week:** 3

**Teaching Hours:** 40 hours

The students are expected to write program in 'VB.NET' language unit wise as given below. The list in each unit is **indicative only and may or may not be asked in the examination.**

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
<b>1</b>	<b>Object Oriented Programming</b>	<b>10 hours</b>
1	Create shape class as abstract class having area function. Create rectangle, triangle, square class based on this class.	
2	Write a program to create class Person. Make at least five properties and one method "show detail" of this class. Now inherit class Student and Faculty from class Person and override method "show detail". Create objects of Student and Faculty class and call show detail function for both objects to show details in appropriate text boxes.	
3	Write a program to implement the class Employee. Show Constructor Overloading.	
4	Write a program to implement the class Book. Show Method Overloading.	
5	Create an Invoice application in which user enters the customer name, description, unit price and quantity for the item ordered, then clicks the add item button. The application calculates the order total by multiplying the unit price by the quantity. And calculates a discount based on the order total. The user can then add another item to the order by using all information.	
6	Create the Inventory class. This class represents the collection of product object. It has following members: code, description, price and quantity on hand. Create a property to get the product with the specified code. Create a method to add the product to the collection of products.	
7	Create one class student which stores information of student's Roll no, Name, Total marks, which can not be used from outside	

	<p>the class. Student class must provide properly methods to read and write this information. Student class should provide one function called percentage. Create the other classes from student class FYBCA, SYBCA, TYBCA, which stores marks of different subjects in array marks having no. of elements equal to no. of subjects respectively. The child class must provide function for calculating the total which should be stored in Total Marks of base class. The child classes must have the correct method for calculating percentage according to no. of subjects. Demonstrate the use of these classes.</p>	
<b>2</b>	<b>Advanced Controls in VB.NET</b>	<b>10 hours</b>
1	Create a windows application as a word finder, which finds & replace the occurrence of that word with another word.	
2	Create an application in which a user can enter a numeric value using one scroll bar between 0 to 100 and displays conversion of the value into Fahrenheit.	
3	There are 3 Track Bars on the Form. The first Track Bar is stands for Red, second for Green and third for Blue, depends on the position of indicator the background color of label is display on Mouse Move.	
4	Write a program to create a Treeview dynamically with buttons Add To Root, Add To Selected Node, Remove and Scan buttons. On click of Scan button all the nodes of the Treeview should be listed in the Listbox placed in side by.	
5	Write a Program to Implement a MDI application. It should have File menu with option New, Close, Close All and Exit. It should also have window menu to arrange the child forms like Tile Horizontal, Tile Vertical, Cascade and Arrange Icons.	
6	There are 3 Scroll Bars on the Form. The first Track Bar is stands for Red, second for Green and third for Blue, depends on the position of indicator the background color of form should be changed.	
7	Demonstrate the DateTime Picker control.	
<b>3</b>	<b>Basic Framework Classes</b>	<b>10 hours</b>
1	Write a program to Read and Write the data in Binary Mode using Binary Reader and Binary Writer. The program will have One Textbox (Multiline) and Two Button Read and Write. Write button write the data in file and read button read the data from file and display into textbox.	
2	Write an application which works like a Windows explorer using combo box and list box. <ol style="list-style-type: none"> <li>a. The combo box should display the list of drives.</li> <li>b. The list box should display the list of files and directories.</li> </ol>	
3	Create a stop watch using timer control.	
4	Accept user id & password from user and check that user id must contain one "@" sign and one "." Symbol and password should not contain any special character but contains at least one digit. Password should start with small character and length of password must be greater than 5 characters.	
5	Create following type of arrays. <ul style="list-style-type: none"> <li>• integer</li> <li>• string</li> </ul>	

		Use System.ArrayList class to perform following operations on them <b>Copy Sort Clear Reverse</b> Accept input from user	
	6	Design a form to accept a text from user and then put two text boxes to input word to find and replace.  If user clicks on find button, show index of the first occurrence of the word given in find textbox.  If user clicks replace button, found word should be replaced with the word given for replace.	
	7	Create a file for employee information and call it Employee.txt which stores employee details.  Take information from the user and write it in file. Also display records from file when user clicks on Read button.	
<b>4</b>	<b>ADO.NET</b>		<b>10 hours</b>
	1	Write a Program to develop a Database Application with ADO.NET with Record Navigation and Add, Delete, Save and Update Facility for Books table (bid, bname, qty, priceperunit, total price).	
	2	Take two combo boxes, store roll no in one combo box and name in another combo box. If we change roll no, the corresponding name will appear in another combo box and vice versa.  Use ADO.net for above application.	
	3	Design a following table in Access. Table name = College, Field(col_code, col_name, Address, year, course = "B.C.A, B.Com, B.B.A, PTC") Design Form that Display Above detail. Provide Add, Update, Delete, Next, first, last, pervious functionalities. Create Crystal Report for above application.	
	4	Write a program to create a table emp with the following fields: <b>Field Name      Datatype</b> eno                  Integer ename                Varchar(20) salary                Float birthdate            Date designation         Varchar(20) Design a form which perform Select, Insert, Update and Delete operations on the table emp.	
	5	Create below mentioned Crystal Reports for the above application. <ul style="list-style-type: none"> <li>• List all the Employees having salary more than 25000</li> <li>• List all the Employees who are above the age 35.</li> <li>• List all the Employees designation wise.</li> </ul>	
	6	Create table CANDIDATE with the following columns and data types.	

		<b>Column name     Datatype</b> Ccode             Int Name               Char(20) DOJ                 Date Design a form which perform Select, Insert, Update and Delete operations on the table emp.	
	7	Design a following table in Access. Table name = Book Field(Bookcode,    booktype,    bookpublisher,    bookauther, bookpage, bprice) Design Form that Display Above detail. Provide Add, Update, Delete, Next, first, last, pervious functionalities. Create Crystal Report for above application.	

**Note: These topics can be covered using any version of .NET framework and Visual Studio. Therefore, there will be NO restriction in using the version available with the institute. Topics which are not available in Textbook should be covered from reference books.**

**Textbook:**

Murach's Beginning Visual Basic .NET  
Publisher: BPB Publication  
By Anne Prince

**Reference Books:**

1. Mastering Visual Basic.Net  
Publisher: BPB Publication  
By Evangelos Petroustos
  
2. Programming in Visual Basic .NET  
Publisher: Mc Graw Hill  
By Julia Case Bradley and Anita C. Millspaugh



## **Core Course**

### **CC-306 Software Development Project-PART I**

#### **Course Introduction:**

This course provides an opportunity for students to apply the knowledge and skills acquired in the core courses to larger and more complex problems and to gain experience in working in teams.

#### **Objectives:**

- Students will be exposed to software development process by choosing a typical business/scientific/administrative/system application.
- Define project scope, assess feasibility, and establish a project schedule.
- Get some experience in working with a client organization.
- Gain experience in working in a group for successfully developing the deliverables.

#### **No. of Credits: 5**

**Mode of study:** Half / One day off to work on the project in a week. (Atleast three hours must be allotted in weekly timetable for discussion/preparation of deliverables)

#### **Course Contents:**

Students are expected to work on the following during the semester.

1. Doing System Analysis
2. Preparing System Flow Diagram
3. Developing Entity Relationship Diagram
4. Developing Data Flow Diagram / UML Diagram
5. Building Data Dictionary

#### **Guidelines:**

- **Group Size:** 2 or 3 students.
- **Where to look for Project?**
  - Government Organizations
  - Local Self Government (Municipalities, Panchayats, Urban Development Authorities etc.) or public / private bodies or NGOs.
  - Public Sector Organizations
  - Educational institutes
  - Trading/Business houses
  - Private Organizations
  - Software Consultancy companies (only if the project work seem to be original and beneficial)
  - A challenging in-house software project.
  - The location of the organization is immaterial. It can be
    - Local in the city

- In the vicinity of the city
  - Mostly the work will have to be done at home or the institute.
- **Which Project to Avoid?**
  - The project of system study
  - Involves only modification in existing software, such as porting of software or few updates
  - Involves only data storage and retrieval without any processing.
  - Conventional small applications such as
    - Library Management
    - Examination (conduct or Results)
    - Educational Institute Management
    - Payroll
    - Accounting system or inventory
    - Human Resource

**Note:** Students can take up any of the above only if the application would handle real volume and will have substantial complexities.

- **Preferred Projects:**
  - Will be such as that caters to
    - Innovative areas/ideas
  - Use of emerging technology –
    - RFID
    - GPS
    - Biometrics
    - Bioinformatics, GIS etc.
  - Challenging uses of Communication and Internet
  - Scientific applications
  - Graphics applications
  - Systems software and utilities
  - Embedded software
  - ERP modules
- **Preferred Tools:**
  - Students should feel free to use the tools of their choice subject to permission of the organization.
  - Working on any acceptable project would give good exposure to use of analytical tools, programming skills and development tools. Hence, any programming or development environment should be acceptable.

**Deliverables by the students:**

At the end of the semester, the student should be able to work on the identified the project and submit the documentation (hard copy) and the presentation.

- **Documentation:**

A hard copy of the documentation should consist of the following:

- Cover Page
- Company Certificate
- College Certificate
- Acknowledgement
- Index (with page nos.)
- Organization / Company Profile
- Project Profile
  - Existing System
  - Proposed System
  - Development Tools and Technology used
- System Flow Diagram ( if applicable)
- UML Diagram
- Data Flow Diagram \*
- Entity Relationship Diagram \*
- Data Dictionary / Table Design \*

\* In applications which uses database.

- **Presentation:**

- Presentations can be prepared through slides using any Open Source / PowerPoint /Flash or any other multimedia tool, covering the work shown in the documentation.
- During viva examination, students will be expected to satisfactorily answer questions pertaining to the project profile, diagrams and tables/data dictionary prepared by them.

## Foundation Course FC-301(1) Operation Research

### Course Introduction:

This course aims to equip the students with the basic knowledge of Operations research like Linear Programming, Transportation, and Assignment Problems, Sequencing problems and PERT – CPM Simulations.

### Objectives:

The student would be able

- 1) To understand general concept of Operation Research Techniques.
- 2) To know the Phases and processes of OR.
- 3) To easily identify the application area of Operation Research given the problem area.

**No. of Credits:** 2

**Theory Sessions per week:** 3

**Teaching Hours:** 40 hours

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
<b>1</b>	<b>Operations Research and Linear Programming</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Operations Research</b> <ul style="list-style-type: none"> <li>○ History of Operations Research</li> <li>○ Decision Making</li> <li>○ Framework for Decision Making</li> <li>○ Classification of Operations Research Models</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Linear Programming</b> <ul style="list-style-type: none"> <li>○ Listing the Common Linear Programming Problems</li> <li>○ Basic Terminology</li> <li>○ Assumptions of a Linear Programming Model</li> <li>○ Introduction of Graphical Solution</li> <li>○ Simplex Method and its strategy</li> <li>○ Big M Method</li> <li>○ Solving problem using excel solver</li> </ul> </li> </ul>	
<b>2</b>	<b>Transportation</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Transportation Problems</b> <ul style="list-style-type: none"> <li>○ Transportation Problem and Its Solution</li> <li>○ Northwest Corner Rule</li> <li>○ Least Cost Method</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Assignment Problem</b> <ul style="list-style-type: none"> <li>○ Assignment problem and its solution</li> </ul> </li> </ul>	

<b>3</b>	<b>Sequencing Problems</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• Methods to Solve Single Machine Scheduling Problems</li> <li>• Johnson's Algorithm for Solving N jobs and Two/Three Machine Problem</li> <li>• Three Machine And N Jobs Scheduling Problems using Johnson's Algorithm Extension</li> <li>• Job Shop Scheduling: Two Jobs and M Machines</li> </ul>	
<b>4</b>	<b>Network Models, Simulation</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Network Model</b> <ul style="list-style-type: none"> <li>○ Network Minimization</li> <li>○ Maximum Flow Problem</li> <li>○ Linear Programming Approach to Network Problems</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Simulation</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Monte-Carlo Simulation and its Application</li> </ul> </li> </ul>	

**Textbook:**

Operations Research  
 Publisher: Cengage Learning  
 By M.V.Durga Prasad

**Chapter – 1** (1.1, 1.2, 1.3, 1.4)

**Chapter – 2** (2.1, 2.2, 2.3, 2.5(Overview), 2.6, 2.7, 2.8, 2.11)

**Chapter – 4** (4.1, 4.1.1 (Except Vogel's Approximation Method), 4.3)

**Chapter – 8** (8.1, 8.2, 8.3, 8.4)

**Chapter – 9** (9.1, 9.2, 9.3)

**Chapter – 15** (15.1, 15.2, 15.3)

**Reference Books:**

1. Operations Research (Edition 2008)

Publisher : McGraw Hill

By P Sankara Iyar

2. Operation Research (Edition- 2010)

Publisher: Jaico Publishing House

By Aditham B. Rao

## Foundation Course

### FC-301(2) Management Information System

**Course Introduction:**

This course aims to familiarize students with concepts in management information system and to initiate interest in MIS. This course also aims to introduce the students to apply various concepts of MIS in existing systems. Students will be familiarized with different functional areas and systems where MIS is applied.

**Objectives:**

The student would be able

- 1) To familiarize with the concepts, tools and practices of management information system.
- 2) To understand what is need of decision support system and knowledge management system in an enterprise.
- 3) To have experience of real world problems through case studies.

**No. of Credits: 2**

**Theory Sessions per week: 3**

**Teaching Hours: 40 hours**

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
1	<b>Management Information System, Strategic Information system and Types of MIS</b> <ul style="list-style-type: none"> <li>• <b>Management Information system – An Introduction</b> <ul style="list-style-type: none"> <li>○ Management <ul style="list-style-type: none"> <li>▪ Key Aspects</li> <li>▪ As a Control System</li> <li>▪ Levels of Management</li> </ul> </li> <li>○ Information <ul style="list-style-type: none"> <li>▪ Property and cost of information</li> <li>▪ Cost of Information</li> <li>▪ Information economics</li> <li>▪ Types of Information</li> <li>▪ Classification</li> <li>▪ Characteristics</li> </ul> </li> <li>○ System <ul style="list-style-type: none"> <li>▪ Characteristics</li> <li>▪ Element</li> </ul> </li> <li>○ Information System <ul style="list-style-type: none"> <li>▪ Classification</li> </ul> </li> <li>○ Management Information System <ul style="list-style-type: none"> <li>▪ Definition</li> <li>▪ Scope</li> </ul> </li> </ul> </li> </ul>	10 hours

	<ul style="list-style-type: none"> <li>▪ Characteristics</li> <li>▪ Role</li> <li>▪ Impact</li> <li>▪ Applications</li> <li>▪ Benefits</li> <li>▪ Success and failure</li> </ul> <ul style="list-style-type: none"> <li>○ Strategic Management Information System</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Strategic Information system – An Introduction</b> <ul style="list-style-type: none"> <li>○ Competitive Strategy Concept</li> <li>○ The value Chain and Strategy</li> <li>○ Using Information Technology for Strategic advantage</li> </ul> </li> <li>• <b>Types of MIS</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Transaction Processing System</li> <li>○ Management Information System</li> <li>○ Decision Support System</li> <li>○ Executive Support System for Senior Management</li> <li>○ System That Span the Organizational Management <ul style="list-style-type: none"> <li>▪ Enterprise System</li> <li>▪ Supply chain management system</li> <li>▪ Customer Relationship Management System</li> <li>▪ Knowledge Management System</li> </ul> </li> </ul> </li> </ul>	
<b>2</b>	<b>MIS in Functional Areas and Data warehouse &amp; Data Mining</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>MIS in Functional Areas</b> <ul style="list-style-type: none"> <li>○ Accounting Information system</li> <li>○ Geographical Information System</li> <li>○ Human resource Information System</li> <li>○ Inventory Information System</li> <li>○ Manufacturing Information System</li> <li>○ Marketing Information System</li> <li>○ Quality Information System</li> <li>○ R&amp;D Information System</li> </ul> </li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Data Warehousing and Data Mining</b> <ul style="list-style-type: none"> <li>○ Characteristics of data warehouse</li> <li>○ Benefits of data warehouse</li> <li>○ Criteria of data warehouse</li> <li>○ The Data warehouse Model</li> </ul> </li> <li>• Data Mining Model</li> <li>• Discovery, Relationship, Pattern and Data Mining</li> <li>• Element of Data Mining</li> <li>• Benefits of Data Mining</li> <li>• Problem and Issues of data mining</li> </ul>	

3	<p><b>ERP system and Customer Relationship Management</b></p> <ul style="list-style-type: none"> <li>• <b>ERP system</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Sales and Distribution</li> <li>○ Finance</li> <li>○ Materials Management</li> <li>○ Manufacturing</li> <li>○ Human Resource</li> <li>○ Quality Management</li> </ul> </li> <li>• <b>Customer Relationship Management</b> <ul style="list-style-type: none"> <li>○ Overview</li> <li>○ Electronic customer Relationship Management system <ul style="list-style-type: none"> <li>▪ e-CRM versus CRM</li> <li>▪ Key e-CRM features</li> <li>▪ Evolving to e-CRM</li> <li>▪ Technological and business issues involved in e-CRM</li> <li>▪ E-CRM business drivers</li> <li>▪ E-CRM assessment</li> <li>▪ Issues on Implementing e-CRM system</li> <li>▪ E-CRM Architecture</li> <li>▪ eCRM components</li> <li>▪ The five Engines of e-CRM</li> <li>▪ Implementing of E-CRM</li> <li>▪ Challenges in delivering true E-CRM</li> </ul> </li> </ul> </li> </ul>	10 hours
4	<p><b>Knowledge Management System and Decision support system</b></p> <ul style="list-style-type: none"> <li>• <b>Knowledge Management System</b> <ul style="list-style-type: none"> <li>○ Knowledge Management</li> <li>○ Knowledge Management system</li> <li>○ Types of Knowledge Management System <ul style="list-style-type: none"> <li>▪ Knowledge Network System</li> <li>▪ Knowledge work system</li> <li>▪ Artificial intelligence Management System</li> <li>▪ Expert system</li> </ul> </li> </ul> </li> <li>• <b>Decision support system</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Decision making and MIS</li> <li>○ Decision support system</li> <li>○ Group decision Support System</li> </ul> </li> </ul>	10 hours



**Textbook:**

Management Information System: An Insight  
Publisher: International Book House Pvt. Ltd.  
By Hitesh Gupta

**Reference Books:**

1. Management Information Systems(4<sup>th</sup> Edition)  
Publisher: Mc Graw Hill  
By Waman S Jawadekar
2. Management Information System  
Publisher: PHI  
By Indrajit Chatterjee

## Subject Elective Course SEC-301(1) Software Project Management

### Course Introduction:

This course introduces students to the necessary concepts to manage software projects successfully. Mostly all phases of project life cycle are covered including project initiating, project planning and control, project reporting, risk management and software quality. The trade-offs among the five critical factors affecting project success, i.e., scope, time, cost, productivity, and quality are covered from a number of perspectives. The course also reinforces the importance of software quality and the use of disciplined software development processes in managing successful projects.

### Objectives:

The student would be able

- 1) To get familiar with the characteristics of a project, project management overview, risk in environment and the management of challenges for effective project management.
- 2) To understand and use the project planning principles across all phases of a project.
- 3) To demonstrate competency in the management of a project plan, especially in monitor and controlling a project schedule and budget, tracking project progress.
- 4) To understand how to manage the quality of project.

**No. of Credits:** 3

**Theory Sessions per week:** 3

**Teaching Hours:** 40 hours

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
<b>1</b>	<b>Introduction to Software Project Management, Project Evaluation and Programme Management, An Overview of Project Planning</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Introduction to Software Project Management</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Why is Software Project Management?</li> <li>○ What is Project?</li> <li>○ Software Projects versus Other Types of Project</li> <li>○ Activities Covered by Software Project Management</li> <li>○ Stakeholders</li> <li>○ What is Management? (Only definition)</li> </ul> </li> </ul>	3 hrs
	<ul style="list-style-type: none"> <li>• <b>Project Evaluation and Programme Management</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Evaluation of Individual Projects</li> <li>○ Programme Management</li> </ul> </li> </ul>	2 hrs
	<ul style="list-style-type: none"> <li>• <b>An Overview of Project Planning</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Select Project</li> </ul> </li> </ul>	5 hrs

	<ul style="list-style-type: none"> <li>○ Identify Project Scope and Objectives</li> <li>○ Identify Project Infrastructure</li> <li>○ Analyze Project Characteristics</li> <li>○ Identify Project Product and Activities</li> <li>○ Estimate Effort for Each Activity</li> <li>○ Identify Activity Risks</li> <li>○ Allocate Resources</li> <li>○ Review/ Publicize Plan</li> <li>○ Execute Plan, Lower level of Planning</li> </ul>	
<b>2</b>	<b>Selection of an Appropriate Project Approach, Software Effort Estimation</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Selection of an Appropriate Project Approach</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ The Waterfall Model</li> <li>○ The Spiral Model</li> <li>○ Software Prototyping</li> <li>○ Incremental Delivery</li> <li>○ Atern/Dynamic Systems Development Method</li> </ul> </li> </ul>	4 hrs
	<ul style="list-style-type: none"> <li>• <b>Software Effort Estimation</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Where are Estimates Done?</li> <li>○ Problems with Over-and-Under-Estimates</li> <li>○ The Basis for Software Estimating</li> <li>○ Software Effort Estimation Techniques</li> <li>○ Bottom-Up Estimating</li> <li>○ The Top-down Approach and Parametric Models</li> <li>○ Expert Judgment</li> <li>○ Estimating by Analogy</li> <li>○ Albrecht Function Point Analysis</li> </ul> </li> </ul>	6 hrs
<b>3</b>	<b>Activity Planning, Risk Management</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Activity Planning</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Projects and Activities (Defining Activities)</li> <li>○ Network Planning Models</li> <li>○ Formulating a Network Model</li> <li>○ Adding the Time Dimension</li> <li>○ The Forward Pass</li> <li>○ The Backward Pass</li> <li>○ Identifying the Critical Path</li> <li>○ Activity Float</li> <li>○ Shortening the Project Duration</li> <li>○ Identifying Critical Activities</li> </ul> </li> <li>• <b>Risk Management</b></li> </ul>	7 hrs
		3 hrs

	<ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Risk</li> <li>○ Categories of Risk</li> <li>○ A Framework for Dealing with Risk</li> <li>○ Risk Identification</li> <li>○ Risk Assessment</li> <li>○ Risk Planning</li> </ul>	
<b>4</b>	<b>Resource Allocation, Monitoring and Control, Managing Contracts, Software Quality</b>	<b>10 hours</b>
	<ul style="list-style-type: none"> <li>• <b>Resource Allocation</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ The Nature of Resources</li> <li>○ Cost Schedules</li> </ul> </li> </ul>	2 hrs
	<ul style="list-style-type: none"> <li>• <b>Monitoring and Control</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Visualizing Progress</li> <li>○ Earned Value Analysis</li> </ul> </li> </ul>	3 hrs
	<ul style="list-style-type: none"> <li>• <b>Managing Contracts</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Types of Contracts</li> <li>○ Stages in Contract Placement</li> </ul> </li> </ul>	3 hrs
	<ul style="list-style-type: none"> <li>• <b>Software Quality</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Defining Software Quality</li> </ul> </li> </ul>	2 hrs

**Textbook:**

Software Project Management (5<sup>th</sup> Edition)

Publisher: Mc Graw Hill

By Bob Hughes, Mike Cotterell, Rajib Mall

**Chapter - 1** (1.1, 1.2, 1.3, 1.4, 1.6, 1.9, 1.13 (only definition))

**Chapter - 2** (2.1, 2.4, 2.7)

**Chapter - 3** (3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11)

**Chapter - 4** (4.1, 4.7, 4.8, 4.9, 4.11, 4.12)

**Chapter - 5** (5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10)

**Chapter - 6** (6.1, 6.5(Defining Activities), 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15)

**Chapter - 7** (7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7)

**Chapter - 8** (8.1, 8.2, 8.9)

**Chapter - 9** (9.1, 9.6, 9.8)

**Chapter - 10** (10.1, 10.2, 10.3)

**Chapter - 13** (13.1, 13.4)

**Reference Books:**

1. Elements of Software Project Management  
Publisher : PHI  
By G.P.Sudhakar
2. Software Project Management  
Publisher : Cengage  
By Sanjay Mohapatra

## Subject Elective Course SEC-301(2) Advanced Java

### Course Introduction:

The course helps the students to gain the knowledge of advance concepts in Java programming language like File IO, JApplet, GUI controls, layout management in GUI, event handling, socket programming and java database connectivity.

### Objectives:

The student would be able

- 1) To create their own logic and implement using java programming.
- 2) To develop Graphical User Interface based software using advanced java.
- 3) To know database connectivity through the JDBC-ODBC.
- 4) To develop a minor application of networking through socket programming.

**No. of Credits:** 3

**Theory Sessions per week:** 3

**Teaching Hours:** 40 hours

UNIT	TOPICS / SUBTOPICS	TEACHING HOURS
<b>1</b>	<b>File Input and Output</b>	<b>10 hrs</b>
	<ul style="list-style-type: none"> <li>• File class</li> <li>• File Organization and Streams</li> <li>• Writing to and Reading from a file</li> <li>• Reading and Writing formatted File Data</li> <li>• Reading and Writing Random Access File</li> <li>• Reading and Writing Object to and from File</li> </ul>	10 hrs
<b>2</b>	<b>Japplet and Swing</b>	<b>10 hrs</b>
	<ul style="list-style-type: none"> <li>• JLabel</li> <li>• JTextField/ JPasswordField/JTextArea</li> <li>• JButton</li> <li>• Event Driven Programming</li> <li>• Adding and Removing JApplet Components</li> <li>• Additional Applet Methods</li> <li>• JFrame</li> <li>• Jpanel</li> <li>• JCheckBox</li> <li>• JComboBox</li> <li>• JScrollPane</li> </ul>	10 hrs

<b>3</b>	<b>Layout Managers and Events &amp; Networking</b>	<b>10 hrs</b>
	<ul style="list-style-type: none"> <li>• <b>Layout Managers Events</b> <ul style="list-style-type: none"> <li>○ Layout Managers</li> <li>○ Layout Options</li> <li>○ Understanding Events and Events Handling</li> <li>○ AWT Event class methods</li> </ul> </li> </ul>	4 hrs
	<ul style="list-style-type: none"> <li>• <b>Networking</b> <ul style="list-style-type: none"> <li>○ Overview of java.net package</li> <li>○ Socket Programming (TCP/IP) (Using ServerSocket class Socket class)</li> <li>○ Overview of Socket programming using Datagram (UDP Approach)</li> </ul> </li> </ul>	6 hrs
<b>4</b>	<b>JDBC</b>	<b>10 hrs</b>
	<ul style="list-style-type: none"> <li>• Overview of JDBC and ODBC</li> <li>• Types of Drivers</li> <li>• Creating Database Connection</li> <li>• Executing Statements (insert, update , delete, select to/from table)</li> </ul> <p><b>Note:</b> Database should be any version of <b>Ms Access</b></p>	10 hrs

**Note : Practical Demo of each unit should be given during class teaching.**

**Textbook:**

JAVA for Beginners 4e  
Publication: Cengage Learning  
By Joyce Farrell

**Reference Books:**

1. Advanced Programming in JAVA2  
Publication: Jaico  
By K.Somasundaram
2. Programming in JAVA  
Publication: S.Chand  
By S.S.Khandare
3. Object Oriented Programming in java  
Publication: Dreamtech  
By Dr. G.T.Thampi
4. JAVA Programming  
Publication: Pearson  
By Hari Mohan Pandey

5. Advanced JAVA

Publication: Dreamtech Engineering TextBooks

By M.T.Savaliya