


CMR Institute of Technology, Bangalore		
Department(s): Master of Computer Applications		
Semester: 03	Section(s): - A	
Computer Networks	13MCA31	Lectures/week: 06
Course Instructor(s): Ms. Varsha P		
Course duration: Aug 2016 – November 2016		

Course Objective:

To be familiar with the various types of computer networks and have experience in designing communication protocols; To be exposed to the TCP/IP protocol suite.

Course Pre-requisites:

Should have knowledge in memory, Os and c programming. Capable of analysing algorithms

Course Outcome:

1. Understand the way protocols currently in use in the Internet work and the requirements for designing network protocols.
2. Able to capture and analyse network traffic.
3. Analysing the theory of basic network performance analysis
4. Develop the ability to identify soundness or potential flaws in proposed protocols
5. Understand the current architecture of the Internet and know the entities involved with the day to day running of the Internet and the process involved with development of policy and new protocols.
6. Understand and be able to explain security and ethical issues in computer networking.
7. Able to implement key networking algorithms in simulation

Class #	Chapter Title / Reference Literature	Topic	Percentage of portion covered	
			Reference	Cumulative
1	TB1: 1.1,1 to 1.3, 2.1 to 2.5	Networking Devices, Classification of Computer Networks	6%	6%
2		Network Protocol Stack (TCP/IP and ISO-OSI)		
3		Network Standardization and Examples of Networks		
4	TB3: 2.1 to 2.10 & 3.1-3.1.1 to 3.1.5, 3.2 to 3.5	Data Transmission Concepts, Analog and Digital Data Transmission	19%	25%
5		Data Transmission Concepts, Analog and Digital Data Transmission		
6		Transmission Impairments and Channel Capacity		
7		Transmission Impairments and Channel Capacity		
8		Guided and Wireless transmission		
9		Communication media		
10		Digital modulation techniques (FDMA,TDMA,CDMA)		
11		Digital modulation techniques (FDMA,TDMA,CDMA)		
12	Mobile telephone systems (1G,2G,3G, 4G)		10%	35%
13				
14	TB1: 4.1 to 4.10 & 5.1 to 5.9	Error Detection and Correction Codes	10%	35%
15		Error Detection and Correction Codes		
16		Data Link Protocols		
17		Data Link Protocols and Sliding Window protocols		
18	Data Link Protocols and Sliding Window protocols	8%	43%	
19	Multiple access protocols and Examples: Ethernet			
20	Wireless LAN, Broadband Wireless and Bluetooth			
21	Wireless LAN, Broadband Wireless and Bluetooth			
22	Data Link Layer Switching	27%	70%	
23	Network Layer Design issues			
24	Network Layer Design issues			
25	Network Layer Design issues			
26	TB1: Chapter 16	Routing algorithms		


27		Routing algorithms		
28		Routing algorithms		
29		Congestion Control Algorithms		
30		Congestion Control Algorithms		
31		Congestion Control Algorithms		
32		Quality of Service		
33		Quality of Service		
34		Quality of Service		
35		Internetworking and The Network Layer in the Internet		
36		Internetworking and The Network Layer in the Internet		
37	TB2: 3.1 to 3.4	The Transport Service	22%	92%
38		The Transport Service		
39		Elements of Transport Protocols		
40		Elements of Transport Protocols		
41		Elements of Transport Protocols		
42		Congestion Control		
43		Congestion Control		
44		Congestion Control		
45		The Internet Transport Protocol: UDP		
46		The Internet Transport Protocol: TCP		
47		Performance Issues		
48		Performance Issues		
49	TB2: chapter 7 & 9	DNS	8%	100%
50		E-Mail and WWW		
51		Streaming Audio and Video and Content Delivery		
52		Streaming Audio and Video and Content Delivery		

Syllabus for Sessionals:

Sessional #	Syllabus
T1	Class # 01 – 18
T2	Class # 18 – 36
T3	Class # 37 - 52

Literature:

Book Type	Code	Author & Title	Publication info	
			Edition & Publisher	ISBN #
Text Book	TB1	Computer Networks by Andrew S Tanenbaum, David J Wetheral - (Chapters 1, 2.2, 2.3, 2.5, 2.7, 3.1, 3.2, 3.3, 3.4, 4.2, 4.3, 4.4, 4.5, 4.6, 4.8 Chapter 5, Chapter 6 (excluding 6.7))	5 th Edition, Pearson Education, 2012	978-81-7768-986-1
Text Book	TB2	Data and Computer Communications by William Stallings - (Chapters 3)	8 th Edition, 2006	978-81-253-1632-5
References	RB1	Computer Networks, Principles, Technologies and Protocols for Network Design, by NATALA OLIFER and VICTOR OLIFER	2010	

CMR Institute of Technology, Bangalore		
Department(s): Master of Computer Applications		
Semester: 03	Section(s): A & B	
Programming using JAVA	13MCA32	Lectures/week: 06
Course Instructor(s): Ms Ramya S		
Course duration: Aug 2016 – Nov 2016		

Course Objective:

It stresses the strengths of java, which provide students with the means of writing efficient, maintainable, and portable code. The nature of java language is emphasized in the wide variety of examples and applications. To learn and acquire art of computer programming methodologies, and how to apply for solving a problem.

Pre requisites:

- Knowledge in basic programming like c
- Understanding of oops
- Problem solving

Course Outcome:

1. An understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;
2. A competence to design, write, compile, test and execute straightforward programs using high level language;
3. An appreciation of the principles of object oriented programming;
4. An awareness of the need for professional approach to design and importance of programs.
5. Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
6. Demonstrate the ability to use simple data structures like arrays in a Java program.
7. Be able to make use of members of classes found in the Java API (such as the Math class).
8. Demonstrate the ability to employ various types of selection constructs in a Java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.

Class #	Chapter Title / Reference Literature	Topic	Percentage of portion covered	
			Reference	Cumulative
1		Java Programming Fundamentals The Java Language, The Key Attributes of Object-Oriented Programming, The Java Development Kit	12.4	12.4
2		A First Simple Program, Handling Syntax Errors, The Java Keywords, Identifiers in Java, The Java Class Libraries.		
3		Introducing Data Types and Operators Java's Primitive Types, Literals, A Closer Look at Variables, The Scope and Lifetime of Variables, operators, Shorthand Assignments, Type conversion in Assignments, Using Cast, Operator Precedence, Expressions		
4		Program Control Statements Input characters from the Keyword, if statement, Nested ifs, if-else-if Ladder, Switch Statement, Nested switch statements		
5		for Loop, Enhanced for Loop, While Loop, do-while Loop, Use break, Use continue, Nested Loops		

6	Unit-1	Introducing Classes, Objects and Methods Class Fundamentals, How Objects are Created, Reference Variables and Assignment, Methods	17.6	30
7		Returning from a Method, Returning Value, Using Parameters, Constructors		
8		Parameterized Constructors, The new operator Revisited,		
9		Garbage Collection and Finalizers, The this Keyword.		
10		More Data Types and Operators Arrays, Multidimensional Arrays, Alternative Array Declaration Syntax, Assigning Array References		
11		Using the Length Member, The For-Each Style for Loop, Strings, The Bitwise operators.		
12		String Handling String Fundamentals, The String Constructors, Three String-Related Language Features, The Length() Method, Obtaining the characters within a string		
13		String comparison, using indexOf() and lastIndexOf(),		
14		Changing the case of characters within a string, StringBuffer and String Builder.		
15		A Closer Look at Methods and Classes Controlling Access to Class Members, Pass Objects to Methods, How Arguments are passed, Returning Objects		
16		Method Overloading, Overloading Constructors, Recursion, Understanding Static		
17		Introducing Nested and Inner Classes, Varargs: Variable-Length Arguments.		
18		Inheritance Inheritance Basics, Member Access and Inheritance		
19		Constructors and Inheritance, Using super to Call Superclass constructors		
20		Using super to Access Superclass Members, Creating a Multilevel Hierarchy,		
21		When are Constructors Executed, Superclass References and Subclass Objects		
22	Method Overriding, Overridden Methods support polymorphism			
23	Why Overridden Methods, Using Abstract Classes			
24	Using final, The Object Class	20	50	
25	Interfaces Interface Fundamentals, Creating an Interface, Implementing an Interface			
26	Using Interface References, Implementing Multiple Interfaces,			
27	Constants in Interfaces ,Interfaces can be extended			
28	Nested Interfaces, Final Thoughts on Interfaces.			
29	Packages Package Fundamentals,			
30	Packages and Member Access			

31		Importing Packages, Static Import		
32		Exception Handling The Exception Hierarchy, Exception Handling Fundamentals		
33		The Consequences of an Uncaught Exception, Exceptions Enable you to handle errors gracefully	20	70
34		using Multiple catch clauses, Catching subclass Exceptions, try blocks can be nested		
35		Throwing an Exception, A Closer look at Throwable, using finally, using throws		
36		Java's Built-in Exceptions		
37		New Exception features added by JDK 7, Creating Exception Subclasses.		
38	Unit-2	Multithreaded Programming Multithreading fundamentals, The Thread Class and Runnable Interface		
39		Creating Thread ,Creating Multiple Threads		
40		Determining When a Thread Ends, Thread Priorities		
41		Synchronization, using Synchronization Methods, The Synchronized Statement		
42		Thread Communication using notify(), wait() and notify All()		
43		suspending, Resuming and stopping Threads.		
44		Enumerations, Auto boxing and Annotations 4 Hours Enumerations, Java Enumeration are class types,		
45		The Values () and Valueof () Methods, Constructors		
46		methods, instance variables and enumerations	20	90
47		Auto boxing, Annotations (metadata)		
48		Generics Generics Fundamentals Bounded Types, Generic Methods		
49	Unit-3	Generic Constructors, Some Generic Restrictions.		
50		Applets Applet basics, A complete Applet Skeleton, Applet Initialization and Termination		
51		A key Aspect of an Applet Architecture, Requesting Repainting,		
52		using the status window, Passing parameters to Applets.		
53		Swing Fundamentals The origin and Design philosophy of swing, Components and containers		
54		Layout managers,A first simple swing Example		
55		Event Handling, Exploring Swing Controls-JLabel and ImageIcon	10	100
56		The Swing Buttons, Trees		
57		Networking with Java.net Networking fundamentals, The Networking classes and Interfaces, The InetAddress class		


58	Unit-4	The Socket Class, The URL class		
59		The URLConnection Class, The HttpURLConnection Class.		
60		Exploring Collection Framework Collections Overview, The Collection Interfaces		
61		The collection Classes		
62	Unit-5	The Arrays Class		

Syllabus for Sessionals :

Sessional #	Syllabus
T1	Class # 01 – 20
T2	Class # 21 - 41
T3	Class # 42 - 62

Literature:

Book Type	Code	Author & Title	Publication info	
			Edition & Publisher	ISBN #
Text Book	TB1	Steven Holzner: Ajax: A Beginner's Guide, Tata McGraw Hill, 2009. (Listed topics from Chapters 3, 4, 6, 7, 11, 12)	Tata McGraw Hill, 2009	978-81-317-1472-0
Text Book	TB2	Chafic Kazon and Joey Lott: Programming Flex 3, O'Reilly, 2009. (Listed topics from Chapters 1 to 8, 12 to 15)	O'Reilly, 2009.	978-81-203-4326-9
References	RB1	Getting Started with Flex 3, Jack Herrington and Emily Kim, O'Reilly, 1 st Edition, 2008.	O'Reilly, 1 st Edition, 2008..	978-8173716720
References	RB2	Flex 3: A Beginner's Guide, Michele E. Davis and John A. Phillips, Tata McGraw-Hill, 2008.	Tata McGraw-Hill, 2008.	978-81-312-0535-8
References	RB3	Essential Actionscript 3.0 – Colin Mook, O'Reilly Publications, 2007.	O'Reilly Publications, 2007.	0-07-006272-2
References	RB4	Professional Ajax, Nicholas C Zakas et al, Wrox Publications, 2006.	Wrox Publications, 2006.	

CMR Institute of Technology, Bangalore		
Department(s): Master of Computer Applications		
Semester: 03	Section(s): - A	
SOFTWARE ENGINEERING	13MCA33	Lectures/week: 05
Course Instructor(s): Ms. Neha Agrawal		
Course duration: July 2016 – November 2016		

Course Objective:

- To introduce software engineering and to explain its importance
- To set out the answers to key questions about software engineering
- To introduce ethical and professional issues and to explain why they are of concern to software engineers

Course Pre-requisites:

Knowledge of introductory programming course and programming terminology.

Course Outcome:

- Professional with an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

Class #	Chapter Title / Reference Literature	Topic	Percentage of portion covered	
			Reference	Cumulative
1	Unit1: Overview	Introduction Professional Software Development,	5.76	5.76
2		Attributes of good software , softwareengineering diversity,		
3		IEEE/ ACM code of software engineering ethics		
4		case studies		
5	Unit 2 : Software Process :	Software Process models: waterfall	19.23	24.99
6		incremental development		
7		incremental development		
8		reuses oriented		
9		reuses oriented		
10		Processactivities;		
11		Processactivities;		

12		Coping with change		
13		Coping with change		
14		The rational Unified process.		
15		The rational Unified process.		
16		The rational Unified process.		
17	Unit 3 : Requirements Engineering	Agile Software Development :Agile methods	11.53	36.52
18		Agile Software Development :Agile methods		
19		Plan-driven and agile Development		
20		Extreme Programming		
21		Agile projectmanagement		
22		Scaling agile methods		
23		Scaling agile methods		
24		Unit 4: System Modeling, Architectural Design & Design and implementation		
25	Interaction models			
26	Structural models			
27	Behavioral models			
28	Model-driven engineering			
29	Software architecture: the role of software architecture			
30	Software architecture: the role of software architecture			
31	architectural views			
32	component and connector view			
33	component and connector view			
34	Architectural styles for C&C view			
35	Documenting architectural			

		design.Design: Design concepts,		
36		Documenting architectural design.Design: Design concepts,		
37		Documenting architectural design.Design: Design concepts,		
38		Function oriented design, detailed design		
39		Function oriented design, detailed design		
40		verification, matrix (Complexity matrix for function oriented design)		
41		verification, matrix (Complexity matrix for function oriented design)		
42	Unit 5 : . Component- based software engineering	Components and component model	7.69	74.97
43		Components and component model		
44		CBSE process		
45		Component composition		
46		Component composition		
47	Unit 6: Distributed Software engineering	Distributed system issues	9.61	84.58
48		Client-server computing		
49		Client-server computing		
50		Architectural patterns for distributed systems		
51		Architectural patterns for distributed systems		
52	Software as a service			
53	Unit 7: Planning a software	Process planning, Effort estimation	7.69	92.27

54	Project	Project scheduling and staffing		
55		Software configuration management plan, Quality plan		
56		Risk Management, Project monitoring plan		
57		Risk Management, Project monitoring plan		
58	Unit 8 : Software Testing	Testing fundamentals	7.69	100
59		Black-box testing		
60		White-box testing		
61		Testing process		
52		Testing process		

Syllabus for Internal Assessment Test

Internal Assessment Test	Syllabus
T1	Class # 01 - 19
T2	Class # 20 - 39
T3	Class # 40 -52

Literature

Book Type	Code	Author & Title	Publication Info	
			Edition & Publisher	ISBN #
Text Book	TB1	Software Engineering, Ian Sommerville	9 th Edition, Pearson Education Ltd, 2011	978-81-317-6216-5
Text Book	TB2	An Integrated Approach to Software Engineering, Pankaj Jalote	3rd Edition, Narosa Publishing House, 2005	978-81-7319-702-4
Reference	RB1	Software Engineering-A Practitioners approach, Roger S Pressman	6th edition, McGraw-Hill, 2010.	978-0-07-070113-7
Reference	RB2	Software Engineering Principles and Practices, Hans Van Vliet	3rd Edition, Wiley - India, 2010	



COMPUTER GRAPHICS

13MCA34

Lectures/week: 05

Course Instructor: Dr. Deepa Anand

Course duration: Aug. 2016 – Nov 2016

Course Objectives:

- To understand the basics of computer graphics including transformations and viewing concepts both in 2D and 3D
- To equip students in learning use of OpenGL tool to be able to code transformations (both model and viewing) and basic curves(Bezier)

Prerequisites:

- Discrete Mathematics, Linear Algebra, Trigonometric Functions
- C/C++ Programming

Class	Chapter Title / Reference	Topic	Percentage of	
			Reference	Cumulative
1-12	TB1: 2.9	Graphics Output Primitives and Attributes Introduction to open GL		
	TB1: 3.1-3.5	Coordinate reference frames, Specifying two dimensional world coordinate reference frame in Open GL, Open GL point functions, Open GL line functions, Line drawing algorithms,		
	TB1: 3.9-3.10	Circle generation algorithms, Ellipse generation algorithms, Fill area primitives, Polygon fill areas, OpenGL	14	14


13-20		Two – Dimensional and Three - Dimensional Geometric Transformations		
	TB1: 5.1-5.4	Basic two dimensional geometric transformations, Matrix representations and homogeneous coordinates, Inverse transformations, Two dimensional composite transformations, Other two dimensional transformations, Three dimensional Translation, Rotation, Scaling, Other three dimensional transformations, Affine transformations	14	28
21-26				
	TB1: 6.1-6.3	Two Dimensional Viewing The two dimensional viewing, Clipping window, Normalization and viewport transformations, Clipping algorithms, Two dimensional point clipping,	12	40
27-32				
	TB1: 7.1-7.3	Three Dimensional Viewing The three dimensional viewing concepts, Three dimensional viewing pipeline, Three dimensional viewing coordinate parameters Transformation from world to viewing	12	52
33-38				
	TB2: 8.10-3.2	Curves and Computer Animation Bezier spline curves Raster methods for computer animation, Design of animation sequences, Traditional animation	10	62
39-44				

Syllabus for Internal Exams:

Sessional #	Syllabus
T1	Class # 01 – 20
T2	Class # 21 – 40
T3	Class # 41 – 62

Literature:

Book Type	Code	Author & Title	Publication info	
			Edition & Publisher	ISBN #
Text Book	TB1	Donald Hearn, M.Pauline Baker, Computer Graphics with Open GL	3 rd Edition, Pearson February 2011	978-81-317-
Reference	RB1	Edward Angel, 'Interactive Computer Graphics' – A top down approach using	5 th Edition, Pearson, 2007.	978-0-13-254523-
Reference	RB2	Peter Shirley, Steve Marschner, 'Computer Graphics,	Cengage Learning (Indian edition),	

CMR Institute of Technology, Bangalore		
Department(s): Master of Computer Applications		
Semester: 03	Section(s): --	
PRINCIPLES OF USER INTERFACE DESIGN	16MCA355	Lectures/week: 06
Course Instructor(s): Mrs. B. Vijaya Lakshmi		
Course duration: Aug 2016 – Dec 2016		

Course Objective:

The field of User Interaction investigates how (single) users can best interact with computers. Particular emphasis is put on

- software aspects (as opposed to the input and output devices and the physical workplace), and
- specifically on the layout and operation of the interface ("User Interface Design", "Interface Engineering").

Course outcomes:

CO1:familiarizethe new technologies that provide interactive devices and interfaces.

CO2:develop the processes and evaluate UID.

CO3:understand Direct Manipulation and Virtual Environment

CO4:discuss the command, natural languages and issues in design for maintaining QoS

CO5:persuade user documentations and information search.

Class #	Chapter Title / Reference Literature	Topic
1	TB1: Chapter 1& 2	Introduction Usability of Interactive Systems: Introduction, Usability Goals
2		Usability measures, Usability Motivations
3		Universal Usability
4		Goals for our profession (1.6.1)
5		Guideline, Principles, and Theories: Introduction
6		Guidelines – Navigating the interface, Organizing the display, Getting the users attention,

		Facilitating data entry
7		Principles – Determine the user skill levels, Identify the tasks
8		Principles – Choose an interaction style, Use the eight golden rules of interface design
9		Principles – prevent errors, Integrating automation while preserving human control
10		Theories – Levels of analysis theories, Stages of action models
11		Theories – GOMS and the keystroke-level model, Consistency through grammars, Widget-level Theories, Context-of-use theories
12	TB1: Chapter 3 & 4	Development Processes: Managing Design Processes: Introduction, Organizational Design to support Usability
13		The four pillars of design
14		Development Methodologies
15		Ethnographic Observation
16		Participatory Design
17		Scenario Development
18		Social Impact statement for Early Design Review, Legal Issues.
19		Evaluating Interface Design Introduction
20		Expert Reviews
21		Usability Testing and Laboratories
22		Survey Instruments
23		Acceptance Tests
24		Evaluation During Active Use
25		Controlled Psychologically Oriented Experiments.
26	TB1: Chapter 6& 7	Interaction Styles: Direct Manipulation and Virtual Environments: Introduction, Examples of Direct Manipulation – Command-line versus display editors versus word processors
27		Examples of Direct Manipulation – The VisiCalc spreadsheet and its descendants, Spatial Data Management, Video Games.
28		Examples of Direct Manipulation – Computer-aided design, Office automation, The continuing evolution of direct manipulation
29		Discussion of Direct Manipulation,
30		3D Interfaces
31		Tele_operation ,
32		,Virtual and Augmented Reality.
33		Menu Selection, Form Fillin, and Dialog Boxes: Introduction, Task-Related Menu Organization,
34		Single Menus, Combinations of Multiple Menus,
35		Content Organization, Fast Movement Through Menus,

36		Data Entry with Menus: Form Fillin, Dialog Boxes, and Alternatives,
37		Audio Menus and Menus for small Displays.
38	TB1: Chapter 8 9,,11 & 12	Command and Natural Languages: Introduction
39		Command-Organization functional Strategies
40		The Benefits of Structure,
41		Naming and Abbreviations
42		Natural Language in Computing
43		Interaction Devices: : Introduction,
44		Keyboards and Keypads, Pointing Devices,
45		Speech and Auditory interfaces, Displays-Small and Large
46		Design Issues: Quality of Service: Introduction, Models of Response-Time Impacts
47		Expectations and Attitudes, User Productivity
48		Variability in Response Time, Frustrating Experiences
49		Balancing Function and Fashion: Introduction,
50		Error Messages, Non-anthropomorphic Design, Display
51		Design, Web page Design, Window Design, Color
52	TB1: Chapter 13 &14	User Manuals, Online Help: Introduction, Paper versus Online documentation,
53		Reading from Paper Verses from Displays
54		Shaping the Content of the Manuals, Accessing the documentation
55		Online Tutorials and animated Demonstrations
56		Online Communities for User Assistance, The Development Process
57		Information Search and Visualization: Introduction,
58		Searching in Textual Documents and Database Querying
59		Multimedia Document Searches
60		Advanced Filtering and Search Interfaces
61		Information Visualization: Data by task taxonomy,
62		Challenges for information visualization

Syllabus for Sessions :

Session #	Syllabus
T1	Class # 01 – 19
T2	Class # 20 - 47
T3	Class # 48 - 62

Literature:

Book Type	Code	Author & Title	Publication info	
			Edition & Publisher	ISBN #
Text Book	TB1	Ben Shneiderman, Plaisant, Cohen, Jacobs: Designing the User Interface, (Chapters 1 to 4,6 to 8 and 11 to 14)	5th Edition, Pearson Education, 2010	ISBN: 978-81-317-2163-6
References	RB1	Alan J Dix Janet Finalay : Human-Computer Interaction	III Edition, Pearson Education,2008	ISBN-10: 0130461091 ISBN-13: 978-0130461094
References	RB2	Eberts: User Interface Design	Prentice-Hall, 1994.	ISBN-13: 978-0131403284
References	RB3	Wilber O Galitz: The Essential Guide to User Interface Design - An Introduction to GUI Design, Principles and Techniques,	Wiley-Dreamtech India Pvt. Ltd, 2011.	ISBN-10: 0131403281