### SYLLABUS

## MANONMANIAM SUNDARANAR UNIVERISTY, TIRUNELVELI-12

### **UG - COURSES – AFFILIATED COLLEGES**

Course Structure for

# BCA

## (Choice Based Credit System) (with effect from the academic year 2017- 2018 onwards )

Semester-IV								
Part	Subject Status	ubject Subject Title		Credit				
III	Core	Operating systems	SMCA61	4				
	Core	Computer networks	SMCA62	4				
	Core	Computer graphics	SMCA63	4				
	Major Practical VI	Graphics Lab	SMCAP6	2				
	Major elective II	SOFTWARE PROJECT MANAGEMENT	SECA6B	4				
	Project	Major Project –(group)	SMCA6P	7				



### Total Marks: 100 Internal Exam: 25 marks + External Exam: 75 marks

### A. Scheme for internal Assessment:

Maximum marks for written test: **20 marks 3 internal tests**, each of **I hour** duration shall be conducted every semester. To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

The break up for internal assessment shall be: Written test- 20 marks; Assignment -5 marks Total - 25 marks

### **B.** Scheme of External Examination

**3 hrs.** examination at the end of the semester

- A Part : 1 mark question two from each unit
- B Part: 5 marks question one from each unit
- C Part: 8 marks question one from each unit

### > Conversion of Marks into Grade Points and Letter Grades

S.No	Marks	Letter Grade	Grade point (GP)	Performance
1	90-100	0	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	А	8	Very Good
4	60-69	B+	7	Good
5	50-59	В	6	Above Average
6	40-49	С	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

### <u>Cumulative Grade Point Average (CGPA)</u>

$$\mathsf{CGPA} = \frac{\Sigma \left(\mathsf{GP} \times \mathsf{C}\right)}{\Sigma \mathsf{C}}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

### > Classification

- a) First Class with Distinction : CGPA  $\ge 7.5^*$
- b) First Class

- : CGPA  $\geq$  7.5\* : CGPA  $\geq$  6.0
- . COFA
- c) Second Class :  $CGPA \ge 5.0 \text{ and } < 6.0$ d) Third Class :  $CGPA \le 5.0$



## **CORE SUBJECT – I**

## **OPERATING SYSTEMS**

### **COURSE OBJECTIVES:**

- To understand design issues related to process management and various related algorithms.
- To understand design issues related to memory management and various related algorithms.
- To understand design issues related to File management and various related algorithms.

### UNIT I INTRODUCTION

What is an Operating System: Mainframe Systems – Desktop Systems – Multiprocessor Systems - Distributed Systems – Clustered Systems – Real – time Systems– Handheld Systems.

### UNIT II

### PROCESS CONCEPT

Process Concept – Process Scheduling – Operations on Process – Co-operating processes – Inter Processes - Inter Process communication. CPU Scheduling: Basic Concepts –Scheduling Criteria - Scheduling algorithms – Multi processor Scheduling - Real time Scheduling – Algorithms evaluation.

### UNIT III

### **PROCESS SYNCHRONIZATION & DEADLOCKS**

Process Synchronization: Background – the critical section problem – Synchronization hardware – Semaphores – Classical problems of Synchronization – critical regions – Monitors – Atomic transaction. Deadlocks: System model – Deadlock Characterization – methods for handling Deadlocks – Deadlock prevention – Deadlock Avoidance – Deadlock detection – recovery from Deadlock.

### UNIT IV

#### **MEMORY MANAGEMENT**

Memory management: Background – Swapping – Contiguous memory allocation – paging – segmentation – segmentation with paging. Virtual Memory: Background – Demand paging – Page replacement – Allocation of frames.

### UNIT V

### FILE MANAGEMENT

File System Interface: File concept – Access methods – File system structure – File system implementation – Directories structure - Directory implementation – Allocation methods – Free space management – Efficiency and performance –



Recovery. Mass Storage Structure: Disk Structure – Disk Scheduling – Disk management – Swap space management – RAID structure – Disk attachment – Stable Storage.

### **COURSE OUTCOMES:**

- Master functions, structures and history of operating systems.
- Master various process management concepts including scheduling, synchronization, and deadlocks.
- Be familiar with multithreading.
- Master concepts of memory management including virtual memory.

### **TEXT BOOK:**

1. Operating System Concepts – Abraham Silverschatz and Peter Baer Galvin Addition Wesley publishing company – Sixth Edition.

### **REFERENCE BOOK:**

- 1. Operating System: Intel and Design Principles Fifth Edition, William Stallings, PHI.
- 2. Understanding Operating System, Ida M.Flynn, Ann MclverMchoes.
- 3. Operating Systems Second Edition, Achyuts.Godbole, TMH.



## CORE SUBJECT – II COMPUTER NETWORKS

### **COURSE OBJECTIVES:**

- To understand the basic networking concepts, types of addresses, data communication, protocols etc.
- To understand wired and wireless networks, its types, functionality of each layer.
- To understand importance of network security and cryptography.

### UNIT I

### **NETWORK HARDWARE & SOFTWARE**

LAN-WAN-MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design issues for the layers – connection oriented and connection less services – Service primitives – The relationship of services to protocols. Reference Models: OSI Reference Model - TCP/IP reference Model Comparison of OSI and TCP/IP Critique of OSI and protocols – Critique of TCP/IP reference Model

### UNIT II PHYSICAL LAYER

Guided Transmission Media: Magnetic Media: Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable, Wireless Transmission: Electro Magnetic Spectrum - Radio Transmission - Microwave Transmission - Infrared and Millimeter Waves - Light waves - Communication satellites: Geostationary, Medium- Earth orbit, Low earth Orbit Satellites - Satellites versus fiber.

### UNIT III

### DATA LINK LAYER

Error Detection and corrections – Elementary Data – Link protocols - Sliding window protocols, Medium –access control – Sub Layer: Multiple Access Protocols – Ethernet –Wireless LANs – Broad band wireless – Bluetooth.

### UNIT IV

### **NETWORK & TRANSPORT LAYER**

Network layers: Routing algorithms – congestion control algorithms. Transport layer: Elements of transport protocols – Internet Transfer protocols: TCP.

### UNIT V

### APPLICATIONLAYER

Application Layer: DNS – Email, network security: cryptography – symmetric key algorithms – public key algorithms - digital signatures.

### **COURSE OUTCOMES:**

• To master the concepts of protocols, network interfaces, and



design/performance issues in local area networks and wide area networks.

- To be familiar with wireless networking concepts.
- To be familiar with network tools and network programming.

## **TEXT BOOK:**

 Computer Networks – Andrew S Tenenbaum, 4th Edition PHI (Unit I – 1.2 – 1.4, Unit II -2.2-2.4, Unit III 4.2-4.6, Unit- IV – 5.2,5.3,6.2,6.5, Unit-V – 7.1,7.2,8.1-8.4).

## **REFERENCE BOOKS:**

- 1. Computer Networks Bhushan Trivedi, Oxford University Press.
- 2. Data communication and Networks Achut Godbole, 2007 PHI.
- 3. Computer Networks Protocol, Standards and Interfaces Uyless Black, 2nd Edition PHI.



## **CORE SUBJECT –III**

## **COMPUTER GRAPHICS**

### **COURSE OBJECTIVES:**

- To study various graphical Input and Output devices.
- To study how to manipulate graphics object by applying different transformations.
- To study different algorithms for drawing lines, ellipse, circle parabola etc.

### UNIT I

### **INPUT AND OUTPUT DEVICES**

Introduction: Application and Operations of Computer Graphics - Graphics Packages – Requirements of a Graphical System – GUI. Common Input Devices – Graphical output Devices – Raster Scan Video Principle - Raster Scan CRT Monitors – Color Raster Scan System – Plasma Display – LCD – Hard copy Raster Devices -Raster Scan System – Memory Tube Displays – Plotters – Graphics Accelerators – Coprocessors.

# UNIT II

### ALGORITHMS

Scan Conversion – Methods – Polynomial Method – DDA algorithms for line drawing Algorithm, Circle, Ellipse, Parabola – Bresenham's Line Drawing Algorithm - Bresenham's Circle Drawing Algorithm – Problem of Scan Conversion – Solid Areas – Odd Even Methods – Winding Number Method - Solid Area Filling – Algorithms – Boundary, Flood Fill Algorithm.

### UNIT III

### TRANSFORMATION

Two Dimension Transformations – Translation – Scaling – Rotation – Transformations of Points and Objects – Homogenous Coordinate System and Transformations – Reflection – Shearing – Three Dimension Transformations -Translation – Scaling – Rotation – Reflection – Shearing.

### UNIT IV

### **CLIPPING ALGORITHMS**

2D Viewing and Clipping – Windows and View Ports – Viewing Transformations – Clipping of lines in 2D – Cohen Sutherland Clipping Algorithms – Visibility – Midpoint subdivision method – parametric Clipping – Polygon Clipping – Sutherland Hodgeman Algorithm – Clipping against Concave windows.

### UNIT V

### HIDDEN SURFACE ALGORITHMS

Hidden Surface Elimination – Black Face Removable Algorithm Z buffer Algorithm.



### **COURSE OUTCOMES:**

- Understand the structure of modern computer graphics systems.
- Understand the basic principles of implementing computer graphics primitives.
- Develop design and problem solving skills with application to computer graphics.

### **TEXT BOOK:**

1. Computer Graphics Multimedia and Animation – Malay K.Pakira – PHI Learning 2008.

## **REFERENCE BOOK:**

- 1. Computer Graphics Apurva Desai PHI 2008.
- 2. PrabhatAndleigh, Kiran Thakrar Multimedia system and Design Prentice Hall 2000.



## **MAJOR PRACTICAL – VI**

## **GRAPHICS LAB**

- 1. Write a program so that it shout first display the image as the size of applet, then it should be reduced and again it should be reduced and so on and finally the image should disappear.
- 2. Write a program to scale as image.
- 3. Write a program to rotate an image.
- 4. Write a program to drop word by word a sentence from the top.
- 5. Write a program to draw a line using Bresenham's algorithm.
- 6. Write a program to draw a line using DDA algorithm.
- 7. Write a program to display the News Headlines letter by letter.
- 8. Write a program to display as many balls in the frame in random position.
- 9. Write a program for bouncing a ball and moving with sound effect.
- 10. Write a program to create scenery of rain in the frame with sound of rain.



# SOFTWARE PROJECT MANAGEMENT

### **COURSE OBJECTIVES:**

- To outline the need for software project Management.
- To highlight different technique for software cost estimation and activity planning.
- To know about what is Software Project Management.

### UNIT I

### **CONVENTIONAL SOFTWARE MANAGEMENT**

Waterfall Model - Conventional Software Management Performance – Evolution of Software economics - Software economics – Pragmatic software cost estimation – Improving software economics – Reducing software product size – Improving software process – Team effectiveness – Automation through software environments.

### **UNIT II**

#### VARIOUS STAGES

Lift cycle phases – Engineering and Production stages – Inception, Elaboration, Construction and Transition Phases – Artifacts of the process – The artifact sets – Management, Engineering and Pragmatic artifacts – Model based software Architectures.

### **UNIT III**

#### **WORKFLOWS OF THE PROCESS**

Workflows of the process – Software process Workflows – Iteration Workflows - – Iterative process planning – work breakdown structures – Planning guidelines – cost & schedule estimation process – iteration planning process – pragmatic planning – Project Organizations & responsibilities.



### UNIT IV

### VARIOUS PROCESS

Process automation – Tools – The project environment – Project control and Process Instrumentation – The seven core metrics – Management indicators – Quality indicators – Life cycle expectations – Pragmatic software metrics – Metrics automation – Tailoring the Process – Process discriminates.

### UNIT V

## **MODERN PROJECT PROFILE**

Continuous Integration – Early risk resolution – Evolutionary requirements – software management Principles Next generation software economics – Modern Process transitions.

### **COURSE OUTCOMES:**

- Employ Analytical and Modern project development methodology for the process of project management in delivering successful Real time IT projects.
- Evaluate a project to develop the scope of work, provide accurate cost estimates, software development size, effort, and schedule and network diagram for new program proposals or enhancements to existing Software.
- Understanding and using the risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales.
- Identifying the resources required for a project and to produce a work plan and resource Schedule.

## **TEXT BOOKS:**

- 1. Software Project Management Walker Royce Pearson Education 2012.
- Software Project Management, Bob Hughes and Mike Cotterell- Tata McGraw Hill,2011.
- Software Project Management in practice, Pankaj Jalote, Pearson Education 2012.



## **MAJOR PROJECT – (GROUP)**

# **GUIDELINES FOR PROJECT WORK**

### **COURSE OBJECTIVES:**

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Each student should carry out group Project Work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea.
- The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned.
- Viva-voce will be conducted at the end of VI semester for 100 marks.



