SHANMUGHA ARTS, SCIENCE, TECHNOLOGY & RESEARCH ACADEMY
SASTRA University
TIRUMALAI SAMUDRAM
THANJAVUR – 613402

SUBJECTS OF STUDY AND SYLLABI FOR

B.TECH (CSE) PROGRAMME
## SHANMUGHA
ARTS, SCIENCE, TECHNOLOGY & RESEARCH ACADEMY (SASTRA)
TIRUMALAI SAMUDRAM - 613 402.
School of Computing - B.Tech. (CSE) Scheme
(For Candidates Admitted From 2006 Onwards)

### SEMESTER VI:

<table>
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<tr>
<th>Subject Code</th>
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<th>Credit Points</th>
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<td>BCSCCS601</td>
<td>Security in Computing</td>
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### DEPARTMENTAL Electives:

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<td>BCSDCS601</td>
<td>System Modeling &amp; Simulation</td>
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<td>BCSCCS602</td>
<td>Data warehousing and data Mining</td>
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<td>BCSDCS605</td>
<td>Mobile Computing</td>
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<td>BCSDCS 606</td>
<td>Resource Management Techniques</td>
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BCSCCS601 – SECURITY IN COMPUTING

UNIT I 19


UNIT II 19

**Finite Field-Number Theory:**-Algorithms in Z, Algorithms in Zn, Groups, Rings, Fields – Modular arithmetic- Euclid’s algorithm-Finite field of the form GF(p)- Polynomial Arithmetic- Finite field of the form GF(2^n)-Prime Numbers-Fermat’s & Euler’s Theorem- Discrete Logarithms - Pseudorandom Bit Generation.

UNIT III 18


UNIT IV 19


Text Books:


References:

Unit I: Software engineering


Unit II: Requirements and analysis

System engineering hierarchy - Business process engineering - Product engineering - system modeling - Requirement engineering tasks - Initiating the requirements engineering process – Eliciting requirements – Developing use-cases – Building the analysis model – Negotiating requirements – Validating requirements

Requirements analysis – Approaches - Data modeling concepts – Object oriented analysis – Scene based modeling – Flow-oriented modeling – Class based modeling – creating a behavior al model

UNIT III: Design

Design concepts - Design model – Pattern-based software design Software architecture – Data design – Architectural styles and patterns – Architectural design – Assessing architectural designs – Mapping data flow into a software architecture

Component level design – Designing class-based components – Conducting component level design – Object constraint language – Designing conventional components - Golden rules for interface design – Interface analysis and design models – Interface analysis – Interface design steps – design evaluation

UNIT IV: Testing and metrics

A strategic approach to software testing – strategic issues – Test strategies for conventional software – Test-strategies for object-oriented software – Validation testing – system testing – The art of debugging

Software testing fundamentals – White box testing: Basis path testing – Control structure testing – Black box testing – Object-oriented testing methods applicable at class level - Testing methods - Inter-class test case design – testing for specialized environments, architectures and applications
Software quality – framework for product metrics – metrics for analysis model – metrics for design model – metrics for source code- metrics for testing – metrics for source code

Text book:


References:

UNIT I:  

UNIT II:  
2D transformation-Clipping and Windowing-Line clipping algorithms (Cohen-Sutherland, Liang-Barsky, Nicholl–Lee – Nicoll)–Polygon Clipping (Sutherland-Hodgeman) – Text Clipping – Curve Clipping - Segmented display files – Display file compilation - Modeling and Modeling transformation

UNIT III:  
3D Concepts - Methods of 3D representation - 3D transformation – Viewing – 3D Clipping – Hidden surface and line elimination - Shading and coloring methods - Basic modeling concepts and Modeling methods

UNIT IV:  

Text Books:

References:
BCSCCS604 – COMPUTER NETWORKS

UNIT I


UNIT II


UNIT III


UNIT IV


Text book:


References:

System Software

1. Inter process communication
2. Implementation of a text editor
3. Removal of loop invariants in a ‘C’ program
4. Lexical Analyzer Compiler Tool Study – simple examples, Yacc Study – simple examples
5. Write a lex specification for decimal numbers.
6. Write a lex program which changes any numbers in its input into hexadecimal representation.
7. Write a lex program to change all characters in its input from uppercase to lowercase, unless they're enclosed inside a C comment.
8. Develop a Lex program that generates a symbol table
9. Write a lex program that reads HTML data containing markups written in lowercase (eg: <p>) or mixed case (eg <Code>, and converts some subset of the HTML markups to uppercase (eg <P>). All other text should be written to the output
10. Design of Calculator grammar with variables and real values (using lex and yacc)
11. Simulation of a loader
12. Put the following grammar into the form required by YACC and add error tokens to specify error recovery. Note that the terminals of this grammar are all in bold font. You will need to write a simple lexer as well yacc.

```
program    -> statement_list

statement_list -> statement_list statement
               | statement
               | statement -> ID ::= expression ;
               | if expression then statement_list fi ;
               | null ;

expression    -> expression + ID
               | ID
```

Computer Graphics

1. Drawing through graphic primitives in graphics.h
2. Bresenham’s line drawing algorithm
3. Circle generation algorithm.
4. 2D Transformation, Translation and Rotation, Scaling, Shear and Reflection.
5. 3D Transformation Translation, Rotation, Scaling.
BCSCCS606 – COMPUTER NETWORKS LAB

1. Ping a computer using Java API and Detect system information such as retrieval of computer names and their IP Addresses, obtaining Node Address

2. File Transfer-using TCP.

3. File Transfer-using UDP

4. Using networking communication functions – like sending POP-UP messages via NetMessage functions

5. Simulation of HDLC and X.25 protocols


7. Information transfer using different routing protocols

8. Program to find shortest path in a network.

9. Simple firewall Implementation

10. Serial Communication between PCs (Character Transfer)- Communication via RS 232/ Modems

11. Case Study on web server


13. Study of Wireless LAN Architecture and devices

14. Case study on entire SASTRA intranet (infrastructured network)

Note:

1. Eclipse editor is suggested for java programs
2. NS2 simulator for routing algorithms
WEEK 01  EMPLOYERS' PERSPECTIVE
WEEK 02  BIO DATA / RESUME / CV
WEEK 03  APPLICATION WRITING
WEEK 04  PROFILE PRESENTATION
WEEK 05  APTITUDE TEST VI
WEEK 06  GROUP DISCUSSION PRACTICE
WEEK 07  GROUP DISCUSSION PRACTICE
WEEK 08  INTERVIEW ESSENTIALS
WEEK 09  MOCK INTERVIEW
WEEK 10  TEAM SKILLS IV
WEEK 11  MARKETING SKILLS
WEEK 12  ASSERTIVENESS
WEEK 13  VERBAL ABILITY TEST
WEEK 14  TECHNICAL TEST
WEEK 15  SELF – ACTUALISATION
Unit – I: Introduction, Examples & Primitives 15

Introduction to simulation – advantages and disadvantages – areas of applications – components of systems – types of models
Simulation examples – simulation of Queuing and inventory – principles – discrete event simulation – continuous system simulation

Unit II: System Dynamics, Probability concepts in simulation, Arrival patterns & Service times and Discrete System Simulation 15

System Dynamics – Exponential growth and DK models – dynamic diagrams
Probability – Discrete, Continuous Probability functions – numerical evaluation of continuous probability – uniformly distributed random numbers

Unit – III: Analysis of simulation data 15

Analysis of simulation data – Input modeling – Identifying the distribution with data – parameter estimation – Goodness of fit test – selecting input models without data – multivariate & time series – input models
Verification, calibration and validation of models – output modeling – stochastic nature – measures of performance & estimation – output analysis for terminating and steady state simulations

Unit – IV: Comparision & Evaluation of Alternative system designs 15

Comparision of two systems – several system designs – statistical models – meta model – variance reduction techniques – simulation of manufacturing systems
Text Books:


References:

BCSDCS602 – DATA WAREHOUSING AND DATA MINING

Unit 1: Introduction to Data Warehousing
Data Warehouse, Data Marts, Operational Data Stores, Business Intelligence – Data Warehouse Vs Online transaction processing systems – typical DW/BI operations and OLTP operations – base architectures for data warehouse – Specialized databases - Extraction, Transformation, Cleansing and Loading – ETL Tools – OLAP Tools

Unit 2: Dimensional Modeling & ETL

Considerations for extractions – extraction mechanisms – different sources systems – handling ASCII and EBCDIC data – extraction from ERP and CRM – transformation mechanisms – staging area – lookups, key generation – cleansing concepts – Loading concepts – Full Refresh – Incremental Loads - scheduling

Unit 3: Reporting & Business Intelligence

Unit 4: Data Mining
Text Books:

1. Data Warehousing in the Real World – Sam Anahory, Pearson Education Asia, 2000

References:

UNIT I  

UNIT II  

UNIT III  

UNIT IV  

Text Book:

References:
UNIT I (15)
Introduction: Introduction to Robotics - What is a Robot - Components of an Industrial Robot - Classification, Drives and Control, Performance, End effectors and Grippers.

UNIT II (15)
Sensor And Vision System: Sensor and vision system - Transducers and sensors - Tactile - Proximity and Range sensors - Acoustic - Capacitance, Inductance sensors, Robot vision system - Image acquisition, processing and analysis.

UNIT III (15)
Robot Programming and layout: Robot Programming - Methods, lead through, Motion interpolation. Capabilities and limitations of lead through program. Textual robot languages and its types - Artificial intelligence in Robot programming LISP programming. Speech / voice programming. Robot cell design and layout, workcell design and control, Interlocks.

UNIT IV (15)

Text Book:

References:
UNIT I

UNIT II
Telecommunication systems-GSM,DECT-Satellite systems-Broadcast systems. Wireless LAN-Infrared vs radio transmission, Infrastructure and ad hoc networks, Blue tooth.

UNIT III
Mobile Network layer-Mobile IP, DHCP, Ad hoc networks.-Mobile transport layer-Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP.

UNIT IV
WAP-architecture, wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, wireless application environment, Introduction to WML, Writing a WAP in WML

Text Book:

References:
BCSDCS606– Resource Management Techniques

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**Unit-I**

15


**Unit-II**

15

Network Analysis-Introduction-Activities-Events-Network-Constraints in Network-Construction of the network-Time calculations in networks-Earliest times-Latest times-Float or slack values –Types of floats-Critical path calculations-Critical path method (CPM)-Project evaluation and Review technique (PERT) – Evaluation of the probability of completing the project within the scheduled time.

**Unit-III**

15

Inventory Control: Introduction-Definition of costs involved in inventory – Stock-Economic Order Quantity(EOQ) problem-Fundamental problems of EOQ-Problem of EOQ with finite rate of replenishment-Problem of EOQ with shortage and instantaneous production-Problem of EOQ with shortage, instantaneous production and fixed time-Inventory control techniques- uncertain demand –Buffer stock-ROL-Stochastic problem with uniform demand(discrete units)-The problem of purchase-Inventory-Price Breaks

**Unit-IV**

15

Replacement problems-Introduction-Replacement of items-Deteriorate with time-Replacement of items whose maintenance costs increase with time and the value of money remains the same during the period-Replacement of items whose maintenance costs increases with time and the value of money also changes with time-Replacement of items that fail completely-Individual replacement policy-Problems and solutions.

**Text Book**


**References**

1) ‘Operations Research’ by Hira and Gupta , S.Chand Publications, New Delhi, 1999