

UNIVERSITY OF CALICUT
Faculty of Engineering
Curriculum, Scheme of Examinations and Syllabi for B.Tech Degree Programme with
effect from Academic Year 2000-2001

CS : Computer Science & Engineering

SEVENTH SEMESTER

| Code | Subject | Hours/Week | | | Sessional Marks | University Examination | |
|--------------|------------------------------|------------|----------|-----------|-----------------|------------------------|------------|
| | | L | T | P/D | | Hrs | Marks |
| CS2K 701 | Industrial Management | 3 | 1 | - | 50 | 3 | 100 |
| CS2K 702 | Computer Architecture | 3 | 1 | - | 50 | 3 | 100 |
| CS2K 703 | Number Theory & Cryptography | 3 | 1 | - | 50 | 3 | 100 |
| CS2K 704 | Internet Technologies | 3 | 1 | - | 50 | 3 | 100 |
| CS2K 705 | Elective III | 3 | 1 | - | 50 | 3 | 100 |
| CS2K 706(P) | Compiler Lab | - | - | 3 | 50 | 3 | 100 |
| CS2K 707(P) | Seminar | - | - | 3 | 50 | - | - |
| CS2K 708(P) | Project | - | - | 4 | 50 | - | - |
| TOTAL | | 15 | 5 | 10 | 400 | - | 600 |

Elective III

CS2K 705A - Simulation & Modelling

CS2K 705B - Industrial Psychology

CS2K 705C - Mobile Communication Systems

CS2K 705D - Software Project Management

CS2K 705E - Quantum Computing

CS2K 705F - Entrepreneurship

CS2K 705G - Advanced Topics in Database Systems

CS2K 701 : INDUSTRIAL MANAGEMENT

(common with AI2K/EC2K/EE2K/IC2K/IT2K 701)

3 hours lecture and 1 hour tutorial per week

Module I (13 hours)

Principles of management - management functions - planning - organising - organisation structures - span of control - delegation - directing - leadership and motivation - controlling - decision making - single stage decision making under risk - multistage decision making - decision tree - decision making under uncertainty - equally likely, minimax and maximin criteria

Module II (14 hours)

Operation management - production systems and functions - product design and selection - concept of total quality management and ISO 9000 system of standards - concept of supply chain management - project management - projects and management - network analysis - critical path method (CPM) network - finding critical path - slacks - crashing (time-cost trade off) - PERT network

Module III (12 hours)

Marketing management - concept of market and marketing - marketing function - marketing mix - market research - advertising and sales promotion - human resources management - manpower requirement analysis - recruitment and training - job analysis - job evaluation - wages and incentives

Module IV (13 hours)

Financial management - objectives/functions - concept of time value of money - basics of financial accounting - profit and loss account - balance sheet - costing - elements of costs - cost sheet - allocation of overheads - break-even analysis depreciation - significance and methods of depreciation

Text books

1. Mazda F., *Engineering Management, Low Price Edition*, Addison Wesley
2. Buffa E.S. & Sarin R.K., *Modern Production/Operations Management*, John Wiley
3. Chase R.B., Aquilano N.J. & Jacobs F.R., *Production and Operations Management Manufacturing and Services*, Tata McGraw Hill Publishing Company Limited
4. Kotler P., *Marketing Management: Analysis, Planning, Implementation and Control*, Prentice Hall of India Private Limited
5. Venkata Ratnam C.S. & Srivastava B.K., *Personnel Management and Human Resources*, Tata McGraw Hill
6. Pandey I.M., *Financial Management*, Vikas Publishing House Pvt. Ltd.
7. Bhattacharya A.K., *Principles And Practice of Cost Accounting*, Wheeler Publishing

Reference books

1. Koontz H., O'Donnel C. & Weihrich H., *Essentials of Management*, McGraw Hill Book Company
2. Satya Raju R. & Parthasarathy A., *Management: Text and Cases*, Prentice Hall of India Private Limited
3. Wiest J.D. & Levy F.K., *A Management Guide to PERT/CPM*, Prentice Hall of India Private Limited
4. Ramaswamy V.S. & Namakumari S., *Marketing Management: Planning, Implementation and Control*, Macmillan India Limited
5. Srinivasan R., *Case Studies in Marketing: The Indian Context*, Prentice Hall of India Private Limited
6. Majumadar R., *Marketing Research: Text, Applications and Case Studies*, New Age International (P) Limited Publishers
7. Prasanna Chandra, *Financial Management: Theory and Practice*, Tata McGraw Hill Publishing Company Limited

Sessional work assessment

| | |
|-------------|-----------|
| Assignments | 2x10 = 20 |
| 2 tests | 2x15 = 30 |
| Total marks | = 50 |

University examination pattern

- Q I - 8 short type questions of 5 marks each, 2 from each module
Q II - 2 questions A and B of 15marks each from module I with choice to answer any one
Q III - 2 questions A and B of 15marks each from module II with choice to answer any one
Q IV - 2 questions A and B of 15marks each from module III with choice to answer any one
Q V - 2 questions A and B of 15marks each from module IV with choice to answer any one

CS2K 702 : COMPUTER ARCHITECTURE

3 hours lecture and 1 hour tutorial per week

Module I (15 hours)

Fundamentals - task of a computer designer - trends in technology usage and cost - performance measurement - quantitative principles of computer design - *instruction set architectures* - classification - addressing and operations - encoding an instruction set - role of compilers - *case study* - the DLX architecture - *pipelining* - pipeline for DLX - pipeline hazards - data and control hazards - implementation difficulties - pipelining with multicycle operations

Module II (12 hours)

Instruction level parallelism - concepts and challenges - dynamic scheduling - dynamic hardware prediction - multiple issue of instructions - compiler and hardware support for ILP - *vector processing* - vector architecture - vector length and stride - compiler vectorization - enhancing vector performance

Module III (13 hours)

Memory hierarchy design - reducing cache misses and miss penalty, reducing hit time - main memory - virtual memory and its protection - *case study* - protection in the Intel Pentium - crosscutting issues - *I/O systems* - performance measures - reliability and availability - designing an I/O system - case study - Unix file system performance

Module IV (12 hours)

Interconnection networks - simple networks - connecting more than two computers - practical issues - *multiprocessors* - introduction - application domains - centralised-shared memory and distributed-shared memory architectures - synchronisation - models of memory consistency

Text book

Hennesy J.L. & Pattersen D.A., *Computer Architecture: A Quantitative approach*, Harcourt Asia Pte Ltd. (Morgan Kaufman)

Reference books

1. Pattersen D.A. & Hennesy J.L., *Computer Organisation and Design: The Hardware/Software Interface*, Harcourt Asia Pte Ltd (Morgan Kaufman)
2. Hwang K., *Advanced Computer Architecture: Parallelism, Scalability and Programmability*, McGraw Hill

Sessional work assessment

| | |
|-------------|-----------|
| Assignments | 2x10 = 20 |
| Tests | 2x15 = 30 |
| Total marks | = 50 |

University examination pattern

Q I - 8 short type questions of 5 marks each, 2 from each module

- Q II - 2 questions of 15marks each from module I with choice to answer any one
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Q IV - 2 questions of 15marks each from module III with choice to answer any one
Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 703 : NUMBER THEORY & CRYPTOGRAPHY

3 hours lecture and 1 hour tutorial per week

Module I (12 hours)

Divisibility - gcd and lcm - prime numbers - fundamental theorem of arithmetic - perfect numbers - floor and ceiling functions - *congruence*: properties - complete and reduced residue systems - Fermat's theorem - Euler function

Module II (12 hours)

Indeterminate equations - linear and second degree diophantine equations - congruences in one unknown - chinese remainder theorem - congruences of higher degree with prime and composite modulo - Wilson's theorem - quadratic residues

Module III (14 hours)

Introduction to cryptography - attacks - services and mechanisms - security attacks - security services - *conventional encryption* - *classical techniques* - model - steganography - classical encryption techniques - *modern techniques* - DES - cryptanalysis - block cipher principles and design - *algorithms* - triple DES - IDEA - blowfish - *confidentiality* - placement of encryption function - traffic confidentiality - key distribution - random number generation

Module IV (14 hours)

Public key encryption - RSA algorithm - key management and exchange - elliptic curve cryptography - *message authentication* - requirements - functions and codes - hash functions - security of hash functions and MACS - *hash algorithms* - MD5 message digest algorithm - secure hash algorithm - *digital signatures* - authentication protocols - digital signature standard - *authentication applications* - kerberos

Text books

1. Hsiung C.Y., *Elementary Theory of Numbers* , Allied Publishers (World Scientific), Modules I and II
2. Stallings W., *Cryptography and Network Security Principles and Practice* , Pearson Education Asia, Modules III and I V

Reference books

1. Niven & Zuckerman H.S., *An Introduction to The Theory of Numbers* , John Wiley
2. Schnier B., *Applied Cryptography: Protocols, Algorithms, and Source Code in C*, John Wiley

Sessional work assessment

| | |
|-------------|-----------|
| Assignments | 2x10 = 20 |
| Tests | 2x15 = 30 |
| Total marks | = 50 |

University examination pattern

- Q I - 8 short type questions of 5 marks each, 2 from each module
Q II - 2 questions of 15marks each from module I with choice to answer any one
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Q IV - 2 questions of 15marks each from module III with choice to answer any one
Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 704 : INTERNET TECHNOLOGIES

3 hours lecture and 1 hour tutorial per week

Module I (12 hours)

Computer networks and the Internet - principles of application-layer protocols - HTTP - FTP - e-mail - DNS - socket programming with TCP/UDP - web servers - web pages design using HTML and XML

Module II (13 hours)

Multimedia networking - applications - streaming stored audio and video - Internet telephony - RTP - scheduling and policing mechanisms - integrated services - RSVP - differentiated services - *network management* - the internet network management framework

Module III (14 hours)

Network security - *E-mail security* - privacy - S/MIME - *IP security* - overview - architecture - authentication - header and payload - combining security associations - key management - *web security* - SSL and transport layer security - SET - *systems security* - intruders and viruses - *firewalls* - design - trusted systems

Module IV (13 hours)

Mobile internet - *mobile network layer* - mobile IP - dynamic host configuration protocol - ad hoc networks - *mobile transport layer* - implications of TCP on mobility - indirect TCP - snooping TCP - mobile TCP - transmission - selective retransmission - transaction-oriented TCP - *support for mobility* - file systems - WAP protocols - WML - WML script - wireless telephony applications

Text books

1. Kurose J.F. & Ross K.W., *Computer Networking: A Top -Down Approach Featuring the Internet*, Addison Wesley, Modules I & II
2. Stallings W., *Cryptography and Network Security Principles and practice*, Pearson Education Asia, Module III
3. Schiller J., *Mobile Communications*, Addison Wesley, Module IV

Reference books

1. Deitel H.M., Deitel P.J. & Nieto T.R., *Internet and World Wide Web: How to Program*, Pearson Education Asia
2. Greenlaw R. & Hepp E., *In-line / On -line: Fundamentals of the Internet and the World Wide Web*, Tata McGraw Hill
3. Sharma V. & Sharma R., *Developing e -Commerce Sites: An Integrated Approach*, Addison Wesley
4. Singhal et. al S., *The Wireless Application Protocol*, Pearson Education Asia
5. Goncalves M., *Firewalls: A Complete Guide*, Tata McGraw Hill

Sessional work assessment

Assignments $2 \times 10 = 20$

Tests $2 \times 15 = 30$

Total marks = 50

University examination pattern

Q I - 8 short type questions of 5 marks each, 2 from each module

Q II - 2 questions of 15marks each from module I with choice to answer any one

Q III - 2 questions of 15marks each from module II with choice to answer any one

Q IV - 2 questions of 15marks each from module III with choice to answer any one

Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 705A : SIMULATION & MODELLING

(common with IT2K 705A)

3 hours lecture and 1 hour tutorial per week

Module I (10 hours)

Introduction - systems and models - computer simulation and its applications - continuous system simulation - modelling continuous systems - simulation of continuous systems - discrete system simulation - methodology - event scheduling and process interaction approaches - random number generation - testing of randomness - generation of stochastic variates - random samples from continuous distributions - uniform distribution - exponential distribution m-Erlang distribution - gamma distribution - normal distribution - beta distribution - random samples from discrete distributions - Bernoulli - discrete uniform - binomial - geometric and poisson

Module II (12 hours)

Evaluation of simulation experiments - verification and validation of simulation experiments - statistical reliability in evaluating simulation experiments - confidence intervals for terminating simulation runs - simulation languages - programming considerations - general features of GPSS - SIM SCRIPT and SIMULA

Module III (15 hours)

Simulation of queueing systems - parameters of queue - formulation of queueing problems - generation of arrival pattern - generation of service patterns - Simulation of single server queues - simulation of multiserver queues - simulation of tandem queues

Module IV (15 hours)

Simulation of stochastic network - simulation of PERT network - definition of network diagrams - forward pass computation - simulation of forward pass - backward pass computations - simulation of backward pass - determination of float and slack times determination of critical path - simulation of complete network - merits of simulation of stochastic networks

Note to the question paper setter - programming questions must be based on `C` language or specified simulation languages in the syllabus

Reference books

1. Deo N., *System Simulation And Digital Computer* , Prentice Hall of India
2. Gordan G., *System Simulation* , Prentice Hall of India
3. Law A.M. & Ketton W.D., *Simulation Modelling and Analysis* , McGraw Hill

Sessional work assessment

Assignments* 2x10 = 20

2 Tests** 2x15 = 30

Total marks = 50

* One assignment must be computer based. (practical)

** One sessional test must be computer based.(practical)

University examination pattern

Q I - 8 short type questions of 5 marks each, 2 from each module

Q II - 2 questions of 15marks each from module I with choice to answer any one

Q III - 2 questions of 15marks each from module II with choice to answer any one

Q IV - 2 questions of 15marks each from module III with choice to answer any one

Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 705B : INDUSTRIAL PSYCHOLOGY

(common for all programmes)

3 hours lecture and 1 hour tutorial per week

Module I (13 hours)

Introduction - psychology as a science - areas of applications - study of individual - individual differences - study of behavior - stimulus - response behavior - heredity and environment - human mind - cognition - character - thinking - attention - memory- emotion - traits - attitude - personality

Module II (13 hours)

Organizational behavior - definition - development - fundamental concept - nature of people - nature of organization - an organizational behavior system - models - autocratic model - hybrid model - understanding a social - system social culture - managing communication - downward, upward and other forms of communication

Module III (13 hours)

Motivation - motivation driver - human needs - behavior modification - goal setting - expectancy model - comparison models - interpreting motivational models - leadership - path goal model - style - contingency approach

Module IV (13 hours)

Special topics in industrial psychology - managing group in organization - group and inter group dynamics -managing change and organizational development - nature planned change - resistance - characteristic of OD - OD process

Reference books

1. Davis K. & Newstrom J.W., " *Human Behavior At Work* ", McGraw Hill International

2. Schermerhorn J.R. Jr., Hunt J.G. & Osborn R.N., " *Managing Organizational Behavior* ", John Willy
3. Luthans, " *Organizational Behavior* ", McGraw Hill, International
4. Morgan C.T., King R.A., Rweisz J. & Schoples J., " *Introduction to Psychology* ", McGraw Hill
5. Blum M.L. & Naylor J.C., " *Industrial Psychology* ", CBS Publisher, Horper & Row

Sessional work assessment

2 Tests 2 x 15 = 30

2 Assignments 2 x 10 = 20

Total marks = 50

University examination pattern

Q I - 8 short type questions of 5 marks each, 2 from each module

Q II - 2 questions A and B of 15marks each from module I with choice to answer any one

Q III - 2 questions A and B of 15marks each from module II with choice to answer any one

Q IV - 2 questions A and B of 15marks each from module III with choice to answer any one

Q V - 2 questions A and B of 15marks each from module IV with choice to answer any one

CS2K 705C : MOBILE COMMUNICATION SYSTEMS

3 hours lecture and 1 hour tutorial per week

Module I (12 hours)

Introduction - applications - history of wireless communications - reference model wireless transmission - frequencies for radio transmission - signals - antennas - signal propagation - multiplexing - modulation - spread spectrum - cellular systems - medium access control - specialized MAC - SDMA - FDMA - TDMA - aloha - CSMA - collision avoidance - polling - CDMA - comparison of S/T/F/CDMA

Module II (12 hours)

Telecommunication systems - GSM - mobile services - system architecture - radio interface - protocols - localization and calling - handover - security - new data services - DECT - TETRA - UMTS and IMT-2000 - satellite systems - history - applications - basics - rooting - localization - handover - examples - broadcast systems - overview - cyclic repetition of data - digital audio broadcasting - digital video broadcasting

Module III (12 hours)

Wireless LAN - infrared Vs radio transmissions - infrastructure and adhoc networks - IEEE 802.11 - HIPERLAN - bluetooth - wireless ATM - motivation for WATM working group - WATM services - reference model - functions - radio access layer - handover - location management - addressing - mobile quality of service - access point control protocol

Module IV (16 hours)

Mobile network layer - mobile IP - packet delivery - registration - tunneling and encapsulation - optimizations - reverse tunneling - dynamic host configuration protocol - adhoc networks - routing - algorithms - metrics - mobile transport layer - TCP - indirect TCP - snooping TCP - mobile TCP - retransmission - recovery - transaction oriented TACP - support for mobility - file systems - WWW - WAP - architecture - datagram protocol - transport security - transaction

protocol - session protocol - application - environment - WML - WML script - wireless telephony application - example stacks with WAP

Text book

Schiller J., *Mobile Communications*, Addison Wesley

Reference books

1. Singhal et.al S., *The Wireless Application Protocol*, Addison Wesley
2. Wesel E., *Wireless Multimedia Communications: Networking Video, Voice and Data*, Addison Wesley
3. Gordman D., *Wireless Personal Communications*
4. Comer D.E., *Computer Networks and Internets*, Addison Wesley
5. Lee W.C., *Mobile Collection Tele Communications*, McGraw Hill
6. Ojawpera T. & Ranjee Prasad, *Wide Band CDMA for Third Generation Mobile Communication*

Sessional work assessment

| | |
|-------------|-----------|
| Assignments | 2x10 = 20 |
| Tests | 2x15 = 30 |
| Total marks | = 50 |

University examination pattern

- Q I - 8 short type questions of 5 marks each, 2 from each module
 Q II - 2 questions of 15marks each from module I with choice to answer any one
 Q III - 2 questions of 15marks each from module II with choice to answer any one
 Q IV - 2 questions of 15marks each from module III with choice to answer any one
 Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 705D : SOFTWARE PROJECT MANAGEMENT

(common with IT2K 705D)

3 hours lecture and 1 hour tutorial per week

Module I (12 hours)

Conventional software management - the waterfall model in theory and practice - software economics - pragmatic software cost estimation - reducing software product size - improving software processes - improving team effectiveness - improving automation through software environments - achieving quality - peer inspections - the old and new approaches to software management

Module II (12 hours)

Life cycle phases - inception - elaboration - construction and transition phases - artifacts of the processes - artifact sets - management - engineering and pragmatic artifacts - model based software architectures - software process workflows - iteration workflows - checkpoints - milestones - periodic status assessments

Module III (12 hours)

Iterative process planning - work down structures - planning guidelines - cost and schedule estimating - iteration planning - pragmatic planning - project organizations and responsibilities - process automation tools - project environment - project control and process instrumentation -

core metrics - management indicators - quality indicators - life-cycle expectations - pragmatic software metrics - metrics automation - tailoring the process - project discriminants - examples

Module IV (16 hours)

Modern project profiles - continuous integration - early risk resolution - evolutionary requirements - team work - top software management principles and best practices - next generation cost models - modern software economics - modern process transitions - case study - CCPDS - R - the COCOMO cost estimation model

Text book

1. Royce W., *Software Project Management: A unified Framework* , Addison Wesley

Reference books

1. Conway K., *Software Project Management: From Concept to Deployment* , IDG Books

2. Jacobson I., Booch G. & Rumbaugh J., *The Unified Software Development Process* , Addison Wesley

3. Humphrey W.S., *Introduction to the Personal Software Process* , Addison Wesley

4. Sommerville I., *Software Engineering* , Addison Wesley

Sessional work assessment

Assignments $2 \times 10 = 20$

Tests $2 \times 15 = 30$

Total marks = 50

University examination pattern

Q I - 8 short type questions of 5 marks each, 2 from each module

Q II - 2 questions of 15marks each from module I with choice to answer any one

Q III - 2 questions of 15marks each from module II with choice to answer any one

Q IV - 2 questions of 15marks each from module III with choice to answer any one

Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 705E : QUANTUM COMPUTING

3 hours lecture and 1 hour tutorial per week

Module I (13 hours)

Foundations of quantum theory - states - observable - measurement - dynamics quantum measurement - quantum entanglement - bell's theorems

Module II (13 hours)

Classical information theory - entropy - quantum information theory - quantification of entanglement - communication complexity - quantum cryptography

Module III (13 hours)

Turing machines - reversible computation - universal logic gates and circuits - quantum computers and circuits - quantum algorithms - search - FFT - prime factorisation

Module IV (13 hours)

Quantum simulations - quantum error correction and codes - fault tolerant quantum computation - physical implementations - ion traps - quantum dots - cavity QED - NMR

Reference books

1. Preskill J., *Lecture Notes for the Course on Quantum Computation*
<http://www.theory.caltech.edu/people/preskill/ph229>
2. Berman G.P., Dooten G.D., Mainieri. R. & Tsifrinovich V., *Introduction to Quantum Computers*, World Scientific
3. Lo H.K., Popescu S. & Spiller T., *Introduction to Quantum Computation and Information*, World Scientific
4. Press A., *Quantum Theory: Concepts and Methods*, Kluwer Academic

Sessional work assessment

| | |
|-------------|-----------|
| Assignments | 2x10 = 20 |
| Tests | 2x15 = 30 |
| Total marks | = 50 |

University examination pattern

- Q I - 8 short type questions of 5 marks each, 2 from each module
 Q II - 2 questions of 15marks each from module I with choice to answer any one
 Q III - 2 questions of 15marks each from module II with choice to answer any one
 Q IV - 2 questions of 15marks each from module III with choice to answer any one
 Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 705F : ENTREPRENEURSHIP

(common for all programmes)

3 hours lecture and 1 hour tutorial per week

Module I (20 hours)

Entrepreneurial perspectives - understanding of entrepreneurship process - entrepreneurial decision process - entrepreneurship and economic development - characteristics of entrepreneur - entrepreneurial competencies - managerial functions for enterprise

Module II (10 hours)

Process of business opportunity identification and evaluation - industrial policy - environment - market survey and market assessment - project report preparation - study of feasibility and viability of a project - assessment of risk in the industry

Module III (12 hours)

Process and strategies for starting a venture - stages of small business growth - entrepreneurship in international environment - entrepreneurship - achievement motivation - time management creativity and innovation structure of the enterprise - planning, implementation and growth

Module IV (10 hours)

Technology acquisition for small units - formalities to be completed for setting up a small scale unit - forms of organizations for small scale units - financing of project and working capital - venture capital and other equity assistance available - break even analysis and economic ratios technology transfer and business incubation

Reference books

1. Koontz H. & Weihrich H., *Essentials of Management*, McGraw Hill International
2. Hirich R.D. & Peters Irwin M.P., *Entrepreneurship*, McGraw Hill
3. Rao T.V., Deshpande M.V., Metha P. & Nadakarni M.S., *Developing Entrepreneurship - A Hand Book, Learning Systems*
4. Kurado D. & Hodgelts R.M., *Entrepreneurship A Contemporary Approach*, The Dryden Press
5. Dr Patel V.G., *Seven Business Crisis*, Tata McGraw Hill
6. Timmons J.A., *New Venture Creation - Entrepreneurship for 21st Century*, McGraw Hill International
7. Patel J.B., Noid S.S., *A Manual on Business Opportunity Identification*, Selections, EDII
8. Rao C.R., *Finance for Small Scale Industries*
9. Pandey G. W., *A Complete Guide to Successful Entrepreneurship*, Vikas Publishing

Sessional work assessment

| | |
|-------------|-----------|
| Assignments | 2x10 = 20 |
| Tests | 2x15 = 30 |
| Total marks | = 50 |

University examination pattern

- Q I - 8 short type questions of 5 marks each, 2 from each module
 Q II - 2 questions of 15marks each from module I with choice to answer any one
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 Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 705G : ADVANCED TOPICS IN DATABASE SYSTEMS

(common with IT2K 705G)

3 hours lecture and 1 hour tutorial per week

Module I (11 hours)

Overview of relational database concept - object oriented database - overview of object oriented concepts - object definition language - object query languages - object database conceptual design - overview of CORBA standard for distributed objects

Module II (13 hours)

Distributed database concepts - data fragmentation replication and allocation - types of distributed database system - query process - concurrency control for distributed database - overview of client - server architecture and its relationship to distributed database

Module III (13 hours)

Deductive database - introduction to deduction database prolog/datalog notation - interpretation of rules - basic inference mechanism for logic programs - datalog programs and their evaluation - deduction database systems - dataware housing and data mining - database on World Wide Web - multimedia database - mobile database - geographic information system - digital libraries

Module IV (15 hours)

Oracle and microsoft access - basic structure of the oracle system m database structures and its manipulation in oracle - storage organization programming oracle applications - oracle tools - an overview of microsoft access features and functionality of access - distributed databases in oracle

Text book

1. Elmasri & Navathe, *Fundamentals of Database Systems*, Addison Wesley

Reference books

1. Ramakrishnan R. & Gehrke J., *Database Management Systems*, McGraw Hill

2. O'neil P. & O'neil E., *Database Principles, Programming, and Performance*, Harcourt Asia (Morgan Kaufman)

3. Silberschatz, Korth H.F. & Sudarshan S., *Database System Concepts*, Tata McGraw Hill

4. Theory T.J., *Database Modelling and Design*, Harcourt Asia (Morgan Kaufman)

Sessional work assessment

Assignments 2x10 = 20

Tests 2x15 = 30

Total marks = 50

University examination pattern

Q I - 8 short type questions of 5 marks each, 2 from each module

Q II - 2 questions of 15marks each from module I with choice to answer any one

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Q IV - 2 questions of 15marks each from module III with choice to answer any one

Q V - 2 questions of 15marks each from module IV with choice to answer any one

CS2K 706(P) : COMPILER LAB

3 hours practical per week

Lab 1,2 : Generation of lexical analyzer using tools such as LEX.

Lab 3,4 : Generation of parser using tools such as YACC.

Lab 5,6 : Creation of Symbol tables.

Lab 7,8 : Creation of type checker.

Lab 9,10 : Generation of intermediate code.

Reference books

1. Halub A.I., *Compiler Design in C*, Prentice Hall India

2. Appel A.W., *Modern Compiler Implementation in C*, Cambridge University Press

Sessional work assessment

| | |
|----------------------------------|------|
| Laboratory practicals and record | = 30 |
| Tests | = 20 |
| Total marks | = 50 |

CS2K 707(P) : SEMINAR

3 hours lecture and 1 hour tutorial per week

Each student is expected to present a seminar on a topic of current relevance in Computer Science and Engineering - they are expected to refer research and review papers from standard journals like ACM, IEEE, JPDC, IEE etc. - at least three cross references must be used - the seminar report must not be the reproduction of the original paper

Sessional work assessment

| | |
|--------------|------|
| Presentation | = 20 |
| Discussion | = 10 |
| Report | = 20 |
| Total marks | = 50 |

CS2K 708(P) : PROJECT

4 hours practical per week

This project is for a duration of two semesters - each student group (not more than 5 members in a group) is expected to develop a complete product - the design and development may include hardware and/or software - the seventh semester is mainly for the design of the product - an interim report is to be submitted at the end of the semester - the assessment may be made individually and in groups

Sessional work assessment

| | |
|-------------|------|
| Design | = 25 |
| Attendance | = 10 |
| Report | = 15 |
| Total marks | = 50 |