Revised Syllabus (Effective from the session 2015-16)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

B.Tech. I Year

Semester - I

DSC/ SEC/ AECC	Course Code	Subject	Periods			Evaluation Scheme				Total Marks	Credits
						Continuous Internal Assesment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSC01	ECH 101	Engineering Chemistry	3	1	0	20	10	30	70	100	4
DSC02	EMA 101	Engineering Mathematics– I	3	1	0	20	10	30	70	100	4
DSC03	EME 101	Fundamental of Mechanical Engineering	3	1	0	20	10	30	70	100	4
DSC04	ECS 101	Problem Solving Through 'C'	3	1	0	20	10	30	70	100	4
SEC01	EHU 101	Vedic Engineering	2	0	0	20	10	30	70	100	2
AECC01	ENS 101	Environmental Studies	2	0	0	20	10	30	70	100	2
PRACTICAL											
DSC01 Lab	ECH 151	Engineering Chemistry Lab	0	0	2	20	10	30	70	100	2
DSC03 Lab	EME 151	Basic Mechanical Engineering Lab	0	0	2	20	10	30	70	100	2
DSC04 Lab	ECS 151	Computer Programming Lab	0	0	2	20	10	30	70	100	2
DSC05 Lab	EME 153	Engineering Graphics	0	0	2	20	10	30	70	100	2
SEC02 Lab	ESA 151	Physical Training & Yoga	0	0	2	0	0	100	0	100	0
		TOTAL	16	4	10	200	100	300	700	1000	28

Coding:

ECS : Computers
EEC : Electronics
EMA : Mathematics
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ENS : Environment
DSC :Discipline Specific Course
AECC : Ability Enhancement Compulsory Course
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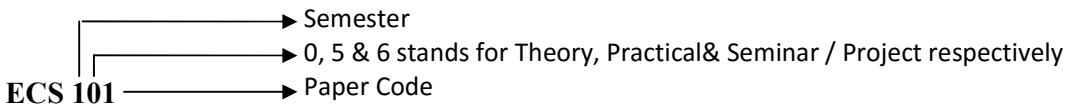

L- LECTURE; T- TUTORIAL; P- PRACTICAL; CT-CUMULATIVE TEST; TA- TEACHER ASSESSMENT; ESE–ENDSEMESTER EXAMINATION

Revised Syllabus (Effective from the session 2015-16)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

B. Tech. I Year

Semester - II

DSC/AECC	Course Code	Subject	Periods			Evaluation Scheme				Total marks	Credit
						Continuous Internal Assesment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSC06	EPH 201	Engineering Physics	3	1	0	20	10	30	70	100	4
DSC07	EMA 201	Engineering Mathematics–II	3	1	0	20	10	30	70	100	4
DSC08	EEE 201	Basic Electrical Engineering	3	1	0	20	10	30	70	100	4
DSC09	EEC 201	Basic Electronics Engineering	3	1	0	20	10	30	70	100	4
DSC10	EME 202	Basic Manufacturing Process	3	1	0	20	10	30	70	100	4
PRACTICAL											
DSC06 Lab	EPH 251	Engineering Physics Lab	0	0	2	20	10	30	70	100	2
DSC08 Lab	EEE 251	Basic Electrical Engineering Lab	0	0	2	20	10	30	70	100	2
DSC09 Lab	EEC 251	Basic Electronics Engineering Lab	0	0	2	20	10	30	70	100	2
DSC11 Lab	EME 252	Workshop Practice	0	0	2	20	10	30	70	100	2
AECC02 Lab	EHU 251	Technical Communication	0	0	2	20	10	30	70	100	2
		TOTAL	15	5	10	200	100	300	700	1000	30

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ESE : End Semester Examination

ECS 101
- 1 → Semester
- 0, 5 & 6 stands for Theory, Practical& Seminar / Project respectively
- 101 → Paper Code

L- LECTURE; T- TUTORIAL; P- PRACTICAL; CT-CUMULATIVE TEST; TA- TEACHER ASSESSMENT; ESE–ENDSEMESTER EXAMINATION

Revised Syllabus (Effective from the session 2016-17)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

B.Tech. II Year

Semester - III

DSC	Course Code	Subject	Periods			Evaluation Scheme				Total Marks	Credits
						Continuous Internal Assesment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSC12	ECS301/ ECS405	Data Structure-I	3	1	0	20	10	30	70	100	4
DSC13	EMA301	Engineering Mathematics- III	3	1	0	20	10	30	70	100	4
DSC14	ECS302	Computer Architecture	3	1	0	20	10	30	70	100	4
DSC15	EEC302	Digital Electronics	3	1	0	20	10	30	70	100	4
DSC16	ECS303	Software Engineering	3	1	0	20	10	30	70	100	4
DSC17	EEE302/ EEE403	Network Analysis & Synthesis	3	1	0	20	10	30	70	100	4
PRACTICAL											
DSC12 Lab	ECS351/ ECS454	Data Structure-I Lab	0	0	2	20	10	30	70	100	2
DSC18 Lab	ECS353	Simulation Lab	0	0	2	20	10	30	70	100	2
DSC14 Lab	ECS352	Computer Architecture Lab	0	0	2	20	10	30	70	100	2
DSC15 Lab	EEC352	Digital Electronics Lab	0	0	2	20	10	30	70	100	2
		TOTAL	18	6	8	200	100	300	700	1000	32

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ECS 101 → Paper Code
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L- LECTURE; T- TUTORIAL; P- PRACTICAL;
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Revised Syllabus (Effective from the session 2016-17)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

B.Tech. II Year

Semester - IV

DSC	Course Code	Subject	Periods			Evaluation Scheme				Total Marks	Credit
						Continuous Internal Assesment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSC19	ECS401	Software Project Management	3	1	0	20	10	30	70	100	4
DSC20	EMA401	Discrete Mathematics	3	1	0	20	10	30	70	100	4
DSC21	ECS402	Operating System	3	1	0	20	10	30	70	100	4
DSC22	EMA402	Numerical Analysis	3	1	0	20	10	30	70	100	4
DSC23	ECS403	Database Management System	3	1	0	20	10	30	70	100	4
DSC24	ECS404/ ECS506	Object Oriented Programming Using C++	3	1	0	20	10	30	70	100	4
PRACTICAL											
DSC23 Lab	ECS451	DBMS Lab	0	0	2	20	10	30	70	100	2
DSC24 Lab	ECS452/ ECS554	Object Oriented Programming Lab	0	0	2	20	10	30	70	100	2
DSC22 Lab	EMA452	Numerical Analysis Lab	0	0	2	20	10	30	70	100	2
DSC21 Lab	ECS453	Operating System Lab	0	0	2	20	10	30	70	100	2
		TOTAL	18	6	8	200	100	300	700	1000	32

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Revised Syllabus (Effective from the session 2017-18)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

B.Tech. III Year

Semester - V

DSC	Course Code	Subject	Periods			Evaluation Scheme				Total Marks	Credit
						Continuous Internal Assessment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSC25	ECS501	Java Programming	3	1	0	20	10	30	70	100	4
DSC26	ECS505	Cloud Computing	3	1	0	20	10	30	70	100	4
DSC27	ECS502	Design Analysis of Algorithm	3	1	0	20	10	30	70	100	4
DSC28	EEC505/ EEC402/ EEC605	Microprocessor and Microcontroller	3	1	0	20	10	30	70	100	4
DSC29	ECS503	Computer Graphics	3	1	0	20	10	30	70	100	4
DSC30	ECS504	Computer Networks	3	1	0	20	10	30	70	100	4
PRACTICAL											
DSC25 Lab	ECS551	Java Programming Lab	0	0	2	20	10	30	70	100	2
DSC28 Lab	EEC553/ EEC451/ EEC654	Microprocessor and Microcontroller Lab	0	0	2	20	10	30	70	100	2
DSC26 Lab	ECS552	Cloud Computing Lab	0	0	2	20	10	30	70	100	2
DSC31 Lab	ECS560	Project/Seminar	0	0	2	20	10	30	70	100	2
		TOTAL	18	6	8	200	100	300	700	1000	32

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Revised Syllabus (Effective from the session 2017-18)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

B.Tech. III Year

Semester - VI

DSC	Course Code	Subject	Periods			Evaluation Scheme				Total Marks	Credit
						Continuous Internal Assessment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSC32	ECS601	Theory of Computation	3	1	0	20	10	30	70	100	4
DSC33	ECS602	Enterprise Computing with Java	3	1	0	20	10	30	70	100	4
DSC34	ECS603	Distributed System	3	1	0	20	10	30	70	100	4
DSC35	ECS604	Data Structure-II	3	1	0	20	10	30	70	100	4
DSC36	ECS605	Artificial Intelligence	3	1	0	20	10	30	70	100	4
DSC37	ECS606	DSC53-.net Technologies	3	1	0	20	10	30	70	100	4
PRACTICAL											
DSC33 Lab	ECS651	Enterprise Computing with Java Lab	0	0	2	20	10	30	70	100	2
DSC37 Lab	ECS652	.net Technologies Lab	0	0	2	20	10	30	70	100	2
DSC34 Lab	ECS653	Distributed System Lab	0	0	2	20	10	30	70	100	2
DSC35 Lab	ECS654	Data Structure-II Lab	0	0	2	20	10	30	70	100	2
		TOTAL	18	6	8	200	100	300	700	1000	32

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Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering

B.Tech. IV Year

Semester - VII

DSC/DSE	Course Code	Subject	Periods			Evaluation Scheme				Total Marks	Credits
						Continuous Internal Assessment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSC38	ECS701	Compiler Design	3	1	0	20	10	30	70	100	4
DSC39	EMA701	Optimization Techniques	3	1	0	20	10	30	70	100	4
DSC40	ECS702	Cryptography & Network Security	3	1	0	20	10	30	70	100	4
DSC41	ECS703	UNIX	3	1	0	20	10	30	70	100	4
DSE		Elective	3	1	0	20	10	30	70	100	4
PRACTICAL											
DSC41 Lab	ECS751	UNIX Lab	0	0	2	20	10	30	70	100	2
DSC40 Lab	ECS753	Cryptography & Network Security Lab	0	0	2	20	10	30	70	100	2
DSC42 Lab	ECS760	Minor Project	0	0	4	20	10	30	70	100	4
		TOTAL	15	5	8	160	80	240	560	800	28

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SEMESTER-VII

Electives for 7th Semester

S. No	CODE	DSE	SUBJECT
1.	ECS704	DSE01	Visual Programming
2.	ECS705	DSE02	Data Warehousing & Data Mining
3.	ECS706	DSE03	Mobile Computing
4.	ECS 707	DSE04	Collaborative development with Version Control
5.	ECS 708	DSE05	Application Development using PHP
6.	ECS 709	DSE06	Python Programming

Revised Syllabus (Effective from the session 2018-19)

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

B.Tech. IV Year

Semester - VIII

DSE	Course Code	Subject	Periods			Evaluation Scheme				Total Marks	Credit
						Continuous Internal Assessment		CIA Total	ESE		
			L	T	P	CT	TA				
THEORY											
DSE		Elective-I	3	1	0	20	10	30	70	100	4
DSE		Elective-II	3	1	0	20	10	30	70	100	4
DSE		Elective-III	3	1	0	20	10	30	70	100	4
DSE		Elective-IV	3	1	0	20	10	30	70	100	4
PRACTICAL											
DSC43	ECS860	Major Project	0	0	8	0	100	100	300	400	8
		TOTAL	12	4	8	80	140	220	580	800	24

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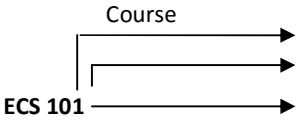

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SEMESTER-VIII

Electives for 8th Semester

S. No	CODE	SUBJECT
1.	ECS 801	DSE07-Distributed Database Management System
2.	ECS 802	DSE08-Advance Computer Network
3.	ECS 803	DSE09-Parallel Algorithms
4.	ECS 804	DSE10-E-Commerce
5.	ECS 805	DSE11-Digital Image Processing
6.	ECS 806	DSE12-Industrial Economics & Business Administration
7.	ECS 807	DSE13-Natural Language Processing
8.	ECS 808	DSE14-Real Time Systems
9.	ECS 809	DSE15-Embedded Systems
10.	ECS 810	DSE16-Advance Computer Architecture
11.	ECS 811	DSE17-Mobile Application Development
12.	ECS 812	DSE18-Big Data
13.	ECS 813	DSE19-Computer Vision
14.	ECS 814	DSE20-Rational Database Management System
15.	ECS 815	DSE21-Storage Management
16.	ECS 816	DSE22-Open Source Software
17.	ECS 817	DSE23-Information Security
18.	ECS 818	DSE24-Soft Computing
19.	ECS 819	DSE25-Business Intelligence

NOTE: Electives will be offered depending upon the availability of teaching staff and minimum thirty students should opt for a particular elective.

NOTE: Electives will be offered depending upon the availability of teaching staff and minimum thirty students should opt for a particular elective.

ECH 101 / ECH 201
DSC01-ENGINEERING CHEMISTRY

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllabus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Periodicity & Chemical Bonding: Atomic radii, Ionization potential, Electro negativity, Electro positivity, Electron affinity and their periodicity. Hybridization involving s, p and d orbital, partial ionic character, dipole moment and its applications, hydrogen bond and Vander Waal's forces, elementary treatment of M.O. theory and its application to homo nuclear diatomic molecules of I and II period elements.

Phase Rule: Gibbs phase rule (without derivation). Applications of Phase rule to one component system (H_2O and S) and two component system (KI- H_2O system). **7**

UNIT II

Chemical kinetics: Arrhenius equation, determination of activation energy, theories of reaction rates (collision and absolute reaction rate theory).

Photochemistry: Laws of Photochemistry, Quantum yield, Fluorescence, Phosphorescence, Chemiluminescence, Jabolinski diagram. **8**

UNIT III

Water Analysis: Hard & soft water, Specification of water, Analysis of water-alkalinity, hardness (EDTA Method only) of water for domestic use, Water softening-soda-lime process, anion exchangers, Boiler-feed water, Boiler problems-scale and sludge, priming & forming, Caustic embittlement & corrosion, their cause and prevention (Removal of dissolved gases, carbonate treatment, Phosphate conditioning, Colloidal conditioning), numerical problems based on hardness. Solid impurities (filterable, non-filterable), pH, D.O, B.O.D., C.O.D.

Polymers: Polymers, thermoplastics, thermosetting plastic, linear, branched & cross linked polymers etc., industrial application of polymers, addition, condensation polymerizations.

(I)Plastics: Structure, properties and uses of thermoplastic (Polyvinyl chloride, Teflon, Nylons and Polymethyl methacrylate) and thermosetting (Bakelite) materials.

(II)Rubber: natural Rubber and it's preparations, vulcanization, mechanism of vulcanization, synthetic rubber (General). **8**

UNIT IV

Fuels: Definition and classification, Calorific value; Gross & Net calorific value and their determination by Bomb calorimeter.

(I)Solid fuels: Coke-it's manufacture by Otto Hoffman oven and uses.

(II) Liquid fuels: Conversion of coal into liquid fuels (Bergius process & Fischer Tropsch process and mechanism), Petroleum- its chemical composition and fractional distillation. Cracking of Heavy oil residues (Thermal cracking and catalytic cracking),Knocking & Anti knocking agents, octane and cetane numbers and their significance.

(III)Gaseous fuels: Natural Gas, Producer gas, Water gas, Carburetted water gas, Coal gas and Oil gas.

(IV)Nuclear fuels: Nuclear fission and nuclear fusion.Nuclear reactor.

Corrosion: Definition and types of corrosion, Electrochemical Theory of corrosion, laws of oxide film, different theories of corrosion, Atmospheric corrosion, stress corrosion water line, pitting and soil corrosion. Protective measures against corrosion **9**

UNIT V

Lubricants: Principle of Lubrication, types of Lubrication, Lubricating oil, fraction from crude oil, de-waxing of oil fraction, acid and solvent, refining of lubricating oils, properties of refined oils (viscosity, viscosity index, acid value, saponification value & iodine value, pour point and cloud point, flash point and fire point, aniline point, and their determination, Lubricant greases (Semi solid) and their Penetration and drop point tests, solid lubricants.

Name Reactions: Reimer Tieman reaction, Aldol Condensation, Diel's Alder Reaction, Wurt'z Reaction and Claisen Reaction. **8**

References

1. Principales of Physical chemistry : B.R. Puri, L.R. Sharma, M. Pathania
2. Advanced inorganic chemistry : Cotton
3. A text book of organic chemistry : S.K. Jain
4. Principals of Physical Chemistry : Samuel Glastone
5. A text book of Engineering chemistry : S.S. Dara
6. A text book of Engineering chemistry : Jain

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EMA 101
DSC02-ENGINEERING MATHEMATICS I

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllabus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Differential CalculusI : Successive differentiation, Leibnitz theorem, Taylor's & Maclaurin's Expansion, Indeterminate forms, Radius of curvature, Asymptotes, Double points and their classification, Tracing of curves. **8**

UNIT II

Differential CalculusII: Partial Differentiation of functions, Normal to surfaces and tangent plane, Change of variables, Jacobian, Taylor's series of two variables, Truncation errors, Extrema of function of two and more variables, Method of Lagrange's multipliers. **7**

UNIT III

Multiple Integrals : Fundamental Theorem of integral calculus, Differentiation under the integral sign, Double and triple integrals, Change of order of integration, change of variables. Application to arc length, area, volume, centroid and moment of inertia. Gamma and Beta functions, Dirichlet's integral. **9**

UNIT IV

Vector Calculus : Differentiation of a vector, Scalar and vector fields, Gradient, Divergence, Curl and their physical meanings, Differential operator and identities, Line, Surface and Volume integrals, Green's theorem in plane.Gauss and Stoke's theorems (without proof). Simple applications. **8**

UNIT V

Matrices : Elementary row/ column operations, Rank of a matrix and its applications,Eigen-values and Eign vectors, Cayley-Hamilton theorem, Diagonalisation of Matrices, Linear dependence and independence, Normal matrices, Complex matrices and unitary matrices. **8**

References

1. Prasad C., A first course in mathematics for Engineers, Prasad Mudranalaya
2. Kreyszig E., Advanced Engineering Mathematics, John Wiley, New York, 1999
3. Grewal B.S., Higher Engineering Mathematics, Khanna, New Delhi, 2000
4. Srivastava R.S.L., Engineering Mathematics Vol.I

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EME 101 / EME 201

DSC03-FUNDAMENTAL OF MECHANICAL ENGINEERING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllabus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Thermodynamics I: Introduction to SI units, Definition of thermodynamic system, Surrounding and Universe, Quasi static process, Energy interaction Zeroth law, Concept of temperature First law of thermodynamics, Application to closed and open system, Concept of Enthalpy, steady flow energy equation, Throttling process.

UNIT II

Thermodynamics II: Second law, reversible and irreversible process, Thermal reservoir, heat engines and thermal efficiency, COP of heat pump and refrigerator, Carnot cycle, Clausius inequality, Concept of entropy, Entropy change for ideal gases.

UNIT III

Thermodynamics III: Generation of steam at constant pressure, Properties of steam, Use of property diagram, Process of vapor in closed and open system, Rankine cycle. Stroke clearance ratio, Compression ratio, Definition and calculation of mean effective pressure (no proof) for air standard cycles (Otto and diesel cycles)

UNIT IV

Mechanics: Trusses: Plane structure, (Method of Joints and Sections only) Beams: Bending moment and shear force diagram for statically determinate beams.

UNIT V

Strength of Materials: Simple stresses and strain, strain energy, stress- strain diagram, elastic constants. Compound stress and strain: state of stress at a point, Simple tension, pure shear,general two dimensional stress system, principal planes, principal stresses and strains, Mohr's stress circle, Poisson's ratio, maximum shear stress

References

1 Kumar DS (2/e), Thermal Science and Engineering, S.K.Kataria, New Delhi,2001
2 P.K.Nag (2/e), Engineering Thermodynamics, TMH, New Delhi,2001
3 R.Yadav(7/e), Thermal Engineering, Central Publishing House, Allahabad, 2000
4 Shames Irving H.(4/e), Engineering Mechanics, PHI, New Delhi, 1994
5 Hibler (1/e), Statics and Dynamics, Pearson Education, Singapore, 2000
6 Pytel & Singer (1/e), Strength of Materials, Addison Wesley, 1999

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 101 / ECS 201
DSC04-PROBLEM SOLVING THROUGH 'C'

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Computers: Block diagram of computers, functions of its important components, Memory and I/O devices. Concept of assembler, interpreter, compiler & generation of languages.
Number System: Decimal, Binary, Octal, and Hexadecimal numbers and their arithmetic (addition, subtraction, multiplication, and division): 1's and 2's complements

UNIT II

Programming in C: History, Introduction to C Programming Languages, Structure of C Programs, Compilation and Execution of C Programs, Debugging techniques, Data Type and sizes, Declarations of variables, Modifiers, Identifiers and keywords, Symbolic Constants, Storage classes(automatic, external, register and static), Enumerations, command line parameters, Macros, The C Preprocessor.
Operators: Unary operators, Arithmetic & Logical operators, Bit wise operators, Assignment operators and expressions, Conditional expressions, Precedence and order of evaluation.
Control Statements: If-else, switch, break, continue, the coma operator, goto statement. **Loops:** while, do-while, for loop.

UNIT III

Arrays: One-dimensional arrays: declaration, initialization and application. Two-dimensional array: declaration, initialization and application, Multidimensional arrays.
Handling of Character Strings: Declaring and initializing string variables, Reading strings, Writing strings, Arithmetic operation on strings, comparison of two strings and string handling functions.
Pointers: Accessing the address of the variable, Declaring and initializing pointers, accessing a variable through its pointer expression, pointer increment and scale factor, pointers and array, pointers and character strings.

UNIT IV

Functions: Need for user defined function, Return value and its type, function calls, No argument and No return values function, Argument and No return values functions, argument and return value functions. Handling of non integer function, Scope and life time of variable in functions.
Recursion: Recursive Definition and processes, recursion in C, example of recursion, Tower oh Hanoi Problem, simulating recursion, Backtracking, recursive algorithms, principles of recursion, tail recursion, removal of recursion.

UNIT V

Structures: Structures definition, giving value to members, structure initialization, array of structures, array within structures, structures within structures, structures and functions, Structure Pointrers.
File Handling: Creating and Deleting a File, Updating File, Copying File, Searching & Sorting in a File.

References:

1. Rajaraman V.(3/e), Fundamental of Computers, PHI, New Delhi, 1999

2. Sanders,D.H., Computers Today, Mcgraw Hill, 1998

3. Kris Jamsa, DOS the complete reference, Tata McGraw Hill

4. J.Peek Tim O'reilly & M.Locekides, UNIX POWER TOOLS, BPB Publication

5. Yashwant Kanetkar, Let Us C, BPB

6. Yashwant Kanetkar, C In Depth, BPB

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EHU 101 / EHU 201
SEC01-VEDIC SCIENCE &ENGINEERING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 2**
2 0 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Science in Vedic literature and Indian Philosophy-I : Kanad's atomic theory, concept of parmanu, Formation of molecules, Parimandal, Comparison with Dalton's atomic theory and models of Thompson, Rutherford and Bhor. Concept of SAMATA and VISHAMTA vs Maxwell-Boltzmann's distribution of velocities and energies.

UNIT II

Science in Vedic literature and Indian Philosophy-II : First and Second Law of thermodynamics in daily life. Law of helplessness of mankind in thermodynamics and Indian philosophy. Entopy in life and concept of pralaya. Dhananjay Vs concept of Radioactivity-life after death. Atomic spectrum Vs concept of Kundalini.

UNIT III

Vedic Mathematics : Measurements in Vedic Times, ancient scale of length, mass, time and temperature, Number system, Geometry according to sulba Sutra. Overview of Vedic Mathematical Rules (ekadhiken pooren, Nikhil navtascharaman dashatah, oordhavatriyagyabhyam)

UNIT IV

Electrical, Electronics & Aeronautical Engineering in Vedas : Concept of electrical Engineering, type of electricity – Tadit, Saudamini, Vidyut, Shatakoti, Haradini, Ashani. Electronics Engineering in Vedic literature. Aeronautical Engineering in Vedic literature, Types of Vimanas and their construction and working, Shakun viman, Rukma viman, Tripura viman, concept of calculator and ancient ways of computation.

UNIT V

Mechanical, Chemical, Civil & Architectural engineering in Vedic Literature : Mechanical & Chemical Engineeering in ancient India,Art of Alchemy,Types of Iron and steel.Civil and Architectural engineering in Vedic literature.Concept of cryptography & Art of secret writing.

Suggested Readings :

1. Science in Vedas by Acharya Vaidyanath Sashtri.
2. Science in the Vedas by Hansraj, Shakti Publications, Ludhiana.

3. Vedic Mathematics by Swamisri Bharati Krishana Teerathaji, Motilal Banarasi Das, Delhi.
4. Brahad Viman shastra by Maharishi Bhardwaj.
5. Vymanika shastra, English translation by G. R. Josyer.
6. Alchemy and Metallic Medicines in Ayurveda by : Vaidya Bhagwan Das.
7. History of Hindu Chemistry by : P. C. Raya
8. Indian Alchemy by : Dr. S. Mahdihassan.
9. Ancient Scientist of Indian by Satya Prakash.
10. Vaishaishik Darshan by Maharishi Kanad.
11. Vedas : The sources of ultimate science by S. R. Verma, Nag Publisher, New Delhi.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ENS 101 / ENS 201
AECC01-ENVIRONMENTAL STUDIES

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 2**
2 0 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

The Multidisciplinary Nature of Environmental Studies & Ecosystems: (a) Definition, scope and importance of ecology and environment (b) The ecological components: (i) Abiotic components: soil, water, light, humidity and temperature (ii) Biotic components & their relationships- symbiosis, commensalisms, parasitism, predation and antibiosis (c) Concept of an ecosystem (d) Structure and function of an ecosystem (e) Producers, consumers and decomposers (f) Energy flow in the ecosystem (g) Ecological succession (h) Food chains, food webs and ecological pyramids (i) Introduction, types, characteristic features, structure and function of the following ecosystems: (i) Forest ecosystem (ii) Grassland ecosystem (iii) Desert ecosystem (iv) Aquatic ecosystems (pond, river, ocean estuaries, streams, lakes) (j) Need for public awareness

UNIT II

Natural Resources: (a) Renewable and Non-Renewable resources (b) Natural resources and associated problems: (i) Forest resources: use and over-exploitation, deforestation case, timber extraction, mining, dams and their effects on forest and tribal people (ii) Water resources: use and over-utilization of surface and ground floods, drought, conflicts over water, dams benefits and problem (iii) Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, case studies (iv) Food resources : world food problems, changes caused by agriculture overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies (v) Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies (vi) Land resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification (vii) Biodiversity & its conservation: definition- genetic, species and ecosystem diversity, values of biodiversity- consumptive use, productive use, social, ethical, aesthetic and option values (viii) Biodiversity at global, national and local levels, India as a mega-diversity nation, hot-spots of biodiversity, threats to biodiversity- habitat loss, poaching of wildlife, man-wildlife conflicts; endangered and endemic species of India, conservation of biodiversity: *in-situ&ex-situ* conservation of biodiversity (ix) Bio-geographical classification of India (x) Role of an individual in conservation of natural resources (xi) Equitable use of resources for sustainable lifestyles.

UNIT III

Environmental Pollution: (a) Definition, causes, effects and control measures of: air pollution, water pollution, soil pollution, noise pollution, thermal pollution and nuclear hazards (b) Solid waste management- causes, effects and control measures of urban and industrial wastes (c) Role of an individual in prevention of pollution (d) Pollution case studies (e) Disaster management: floods, earthquake, cyclone & landslides

UNIT IV

Social Issues and the Environment: (a) From unsustainable to sustainable development (b) Urban problems related to energy (c) Water conservation, rain water conservation, rain water harvesting, management (d) Resettlement & rehabilitation of people- its problems and concerns, case studies (e) Environmental ethics- issues and possible solutions (f) Wasteland reclamation (g) Consumerism and waste products (h) Population growth, variation among nations, family welfare program (i) Environment and human health, human rights, value education (j) HIV/AIDS (k) Role of information technology (IT) in environment and human health (l) Case studies.

UNIT V

Environmental policies and laws: Salient features of following acts (a) Environment Protection Act 1986 (b) Air (Prevention and Control of Pollution) Act 1981 (c) Water (Prevention and Control of Pollution) Act 1974 (d) Wildlife Protection Act 1972 (e) Forest Conservation Act 1980 (f) Issues involved in enforcement of environmental legislation (g) Public awareness

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECH 151 / ECH 251
DSC01 LAB-ENGINEERING CHEMISTRY LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. Find out the surface tension of given liquid by stalagnometer.
2. Find out the viscosity of given liquid by Ostwald's viscometer.
3. Find out pH of given acid/base solution by using pH meter.
5. Determine Na^+ and K^+ concentration using flame photometer.
6. Determine the turbidity of given solution/water sample by turibidimeter.
7. Determination of D.O. of water sample.
8. Find out distribution constant for the distribution of I_2 between CCl_4 and water.
9. Separate the given mixture indicator by using TLC.
10. Separate the given mixture by using paper chromatography
11. Determine the angle of rotation of given solution by using polarimeter.
12. Determination of strength of oxalic acid/Mohr salt by $KMnO_4$.
13. Determination of strength of oxalic acid/Mohr salt by $K_2Cr_2O_7$.
14. Determine the refractive index of given liquid by using Abbe's refractrometer.
15. Determine conductivity of given compound.
16. Determine absorption maxima and concentration of given $KMnO_4$ solution.
17 To observe fluorescence of fluorescent materials.
18. Determine acid value of given oil sample.
19. Determine iodine value of given oil sample.
20. Determine saponification value of given oil sample.

REFERENCES

1. Advanced practical physical chemistry : J.B. Yadav
2. Analytical chemistry Vol. I, II, III : Subhash, Satish
3. Applied chemistry : Virmani and Narula

NOTE

1. In practical examination the student shall be required to perform two experiments.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EME 151 / EME 251

DSC03 LAB-BASIC MECHANICAL ENGINEERING LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. To conduct the tensile test on a UTM and determine ultimate tensile strength, percentage elongation for a steel specimen.
2. To conduct the compression test and determine the ultimate compressive strength for a specimen.
3. To determine the hardness of the given specimen using Brinell / Rockwell / Vicker testing machine.
4. To study the 2-stroke I.C. Engine models.
5. To study the 4-stroke I.C. Engine model.
6. To study close loop system example (Turbine)
7. To study model of Locomotive boiler.
8. To study model of Bibcock boiler.
9. Study of Fire Tube boiler
10. Study of water Tube boiler

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 151 /ECS 251

DSC04 LAB-COMPUTER PROGRAMMING LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. Practice of all internal and external DOS commands.
2. Write simple batch program.
3. Giving exposure to windows environment.
4. File and program management in windows.
5. Practice of all UNIX commands.
6. Introduction to text editing and word processing.
7. Net surfing.
8. Creation and usage of E-mail account.
9. Write a program in C to perform different arithmetic operations.
10. Write a program in C to greater of two numbers.
11. Write a program in C to check whether no. is odd or even.
12. Write a program in C to check whether no. is prime or not.
13. Write a program in C to print Fibonacci series.
14. Write a program in C to print factorial of a no.
15. Write a program in C to add two matrices.
16. Write a program in C to search a no. in array.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EME 153 / EME 253
DSC05 LAB-ENGINEERING GRAPHICS

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. To understand graphics as a tool to communicate ideas, lettering and dimensioning, construction of geometrical figures.
2. To understand orthographic projection: principles of orthographic projections.
3. To understand principle and auxiliary planes.
4. To understand first and third angle projections.
5. To draw a sheet on projections of points.
6. To make two sheets based on projection of lines parallel to both the planes, parallel to one and inclined to other, inclined to both the planes, true length and traces of a line.
7. To make a sheet based on projection of planes, traces of planes, angles of inclinations of planes, parallel planes.
8. To make a sheet projection of solid in simple position, axis or slant edge inclined to one and parallel to other plane, solids lying on a face.
9. To make a sheet using section of solids lying in various positions, true shape of the section.
10. To make a sheet on development of lateral surfaces.
11. To understand isometric projection: principle of isometric projection, isometric projection using box and offset methods.
12. To practice two exercises using computer aided drawing: basic concepts and application.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ESA 151

SEC02- PHYSICAL TRAINING & YOGA

MM : 100 **Sessional : 100**
L T P **Credits: 0**
0 0 2

1. Sports Activities and Development of motor abilities.
   Track and field events
   Game events
2. Yogic Exercises and Pranayam
   Surya Namaskar
   Bhujangasana
   Shalabhasana
   Shrishasana
   Anuloma – Viloma
   Kapal Bhati
   Shitali
   Bhramari

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EPH 201 / EPH 101
DSC06-ENGINEERING PHYSICS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Optics: Interference of light, Coherence, Fresnel's Biprism, Interference in thin films & wedge shaped film, Newton's rings. Diffraction of light, Diffraction at a single slit, Double slits, Plane transmission grating.

Polarization of light,Brewester's Law, Mauls law, Double refraction, Nicol Prism, Production and analysis of polarized light.

UNIT II

Electromagnetics: Gauss' law and its applications.Maxwell's equations, Poynting theorem, Electromagnetic wave equation (elementary idea of each, no derivation). Magnetic induction, Magnetic field intensity, Magnetic permeability and susceptibility (definitions only), Dia, Para,& ferromagnetic materials (Qualitative idea only). Motion of charged particle in uniform electric and magnetic field, Magnetic and electrostatic focusing, Function and block diagram of CRO.

UNIT III

Special Theory of Relativity & Quantum Theory: Inertial & non-inertial frames of reference, Galilean transformation, Lorentz transformation equation of space and time, Michelson-Morlay experiment, Postulates of special theory of relativity, Length contraction, Time dilation, Addition of velocities, Mass energy equivalence& variation of mass with velocities.

Quantum theory of radiations, Planck's law, Photoelectric effect, de-Broglie concept of matter waves, Davisson and Germer experiment, Heisenberg uncertainty principle and its applications, Schrodinger wave equation and its solution for a particle in a box. **10**

UNIT IV

Atomic & Nuclear Physics: Bohr's atomic model and energy level diagram, Sommerfeld relativistic atomic model, Vector atom model, Franck-Hertz experiment, Quantum numbers, general properties of nucleus, Mass defect and packing fraction, Nuclear binding energy, Semi-empirical mass formula. **7**

UNIT V

Solid State Physics: Crystal structure, Miller indices, Separation between lattice planes, Different kinds of crystal bonding, Formation of energy bands in solids (energy level approach), classification of solids, Basic idea of conduction mechanism in semiconductors, Hall effect, X-ray diffraction & Bragg's Law. **7**

References

1. Vasudeva AS, Modern Engineering Physics, S Chand, New Delhi, 1998.
2. Ghatak Ajoy, Optics, TMH, New Delhi, 1999.

3. K.K. Tiwari, Text book of Electricity and Magnetism, S.Chand, New Delhi, 2001
4. Rajam JB.,Atomic Physics, SChand, New Delhi;2000.
5. Beiser Arthur,Concepts of Modern Physics, TMH, New Delhi,1999
6. Mani HS, Modern Physics, New Delhi,1999
7. Kittel Charles(7/e), Introduction to Solid State Physics, John Wiley, Singapore, 1996
8. Murugeshan R (8/e), Modern Physics, S.Chand,New Delhi,2001
9. Kaplan lrving , Nuclear Physics, Narosa ,New Delhi,1998
10. Schiff (3/e), Quantum Mechanics, McGraw, Auckland
11. S.R.Verma, Engg. Physics Vol-I & Vol-II, 2009.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EMA 201
DSC07-ENGINEERING MATHEMATICS II

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Differential Equation : Ordinary differential equations of first order, orthogonal trajectories, linear differential equations with constant coefficients, Euler- Cauchy equations, Equations of the form = f(y). Solution of second order differential equations by change of dependent and independent variables, Method of variation of parameters for second order differential equations. Simple applications. **8** y''

UNIT II

Partial Differential Equations and its Applications : Introduction of partial differential equations, Linear partial differential equations of II order with constant coefficients and their classifications - parabolic, elliptic and hyperbolic with illustrative examples, Method of separation of variables. Wave and Heat equation up to two-dimensions. **9**

UNIT III

Solution in Series : solution in series of second order linear differential equations, Bessel's and Legendre's equations and their solutions, Properties of Bessel function and Legendre's polynomials, Recurrence relations, Generating functions, Jacobi series, Integral representation of Bessel's functions. **8**

UNIT IV

Fourier Series : Fourier series, Dirichlet's condition and convergence. Half range series, Harmonic analysis. **6**

UNIT V

Statistics : Moments, Moment generating functions. Binomial, Poisson and Normal distributions. Correlation and Regression. Method of least squares and curve fitting - straight line and parabola. **8**

References

1. Grewal B.S., Higher Engineering Mathematics, Khanna, New Delhi, 2000
2. Kreyszig E., Advanced Engineering Mathematics, John Wiley, New York, 1999
3. Prasad C.,Advanced Mathematics for Engineers, Prasad Mudranalaya
4. Kapur J. N. & Saxena H.C., Mathematical Statistics

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EEE 101/EEE 201
DSC08-BASIC ELECTRICAL ENGINEERING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

D.C. Network Theory: Concept of elements**,** Circuit theory concepts- Mesh and node analysis, Star-Delta transformation. Network Theorems- Super-position theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, DC Transients- RL, RC circuits.

UNIT II

Steady State Analysis of A.C. Circuits: Sinusoidal and Phasor representation of voltage and current, average and rms value, form and peak factor of sinusoidal and different waveforms, single -phase A.C. circuit- behavior of resistance, inductance and capacitance and their combination in series & parallel and power factor, series parallel resonance-band width and quality factor.
Three Phase A.C. Circuits: Star-Delta connections, line and phase voltage/current relations, three -phase power and its measurement.

UNIT III

Magnetic Circuits: Ampere turns, magnetomotive force, permeability, reluctance, composite magnetic circuits, comparison between magnetic and electric circuits.
Transformer: Principle of operation, types of construction, phasor diagram, equivalent circuit, efficiency and voltage regulation of single-phase transformer, O.C. and S.C. tests.

UNIT IV

D. C. Machines : Principle of electromechanical energy conversion, types of D.C. machines, E.M.F. equation, Magnetization and load characteristics, losses and efficiency, speed control of D.C. motors and applications.
Measuring Instruments: Principle of working and constructional features of Permanent Magnet Moving Coil and Moving Iron ammeters and voltmeters, Electrodynamic Wattmeter, Induction type single-phase Energy meter.

UNIT V

Three-phase Induction Motor: Principle of operation, types and methods of starting, slip-torque characteristics and applications.
Single-phase Induction Motor: Principle of operation, methods of starting.
Three-phase Synchronous Machines: Principle of operation and application of synchronous motor.

Text Books

1. V. Del Toro, Principles of Electrical Engineering, Prentice Hall International.

2. H. Cotton, Advanced Electrical Technology, Wheeler Publishing.

3. E. Huges, Electrical Technology.

References

1. B. L., Theraja, Electrical Technology, Vol-1, S. Chand Publisher, New Delhi.

2. W.H. Hayt & J.E. Kennedy, Engineering circuit Analysis, Mc Graw Hill.

3. I.J. Nagrath, Basic Electrical Engineering, Tata Mc Graw Hill.

4. A.E. Fitgerald, D.E., Higginbotham and A Grabel, Basic Electrical Engineering, Mc Graw Hill.

5. Ashfaq Hussain, Fundamentals of Electrical Engineering, Dhanpat Rai Publish.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EEC 101/ EEC 201
DSC09-BASIC ELECTRONICS ENGINEERING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Semiconductors, energy band description of semiconductors, effect of temperature on semiconductors, intrinsic and extrinsic semiconductors, donor and acceptor impurities, electron and hole concentration, conductivity of a semiconductor, mobility, Hall effect, Fermi level, mass action law, charge densities in a semiconductor, diffusion and continuity equation.

UNIT II

P-N junction and its properties, V-I characteristics of P-N junction, semiconductor-diode, depletion layer, equivalent circuits of junction diode, diode equation, diode resistance and capacitance, application of junction diode as clippers, clampers and rectifiers (Half-wave, Full-wave and bridge), efficiency of rectifiers, ripple factor, filter circuits, Zener and avalanche breakdown mechanism, Zener diode and its characteristics, equivalent circuit of Zener diode, Zener diode as a voltage regulator.

UNIT III

Bipolar junction transistor(BJT) and its action, Transistor configurations (CB, CE and CC) and their characteristics, cut-off, active and saturation regions. Transistor as a switch, operating point, dc load line, Transistor biasing and its necessity, thermal runaway, types of biasing and their analysis, stability factors, Transistor as a regulator.

UNIT IV

Concept of Transistor amplifier, graphical analysis of CE amplifier, dc and ac equivalent circuits, Emitter follower and its ac model. Basic idea of operational amplifier and OP-AMP parameters, inverting, non-inverting and unity gain configurations. Application of OP-AMP as adder, subtractor, differentiator and integrator.

UNIT V

Number system, conversion of bases (decimal ,binary, octal and hexadecimal), addition and subtraction, BCD numbers, Boolean algebra, logic gates, concept of universal gate, canonical forms, Minimization using K-map, don't care conditions.

Text Book

1. Integrated Electronics: Jacob Millman & C.C. Halkias

References

1. Malvino and leach "Digital principle and applications.
2. Streetman Ben.G, "Solid state electronic devices" (3/e), PHI
3. Millman and grabel, "Microelectronics" PHI
4. Robert Bolyestad "Electronic devices and circuit", PHI

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EME 102/EME 202
DSC10-BASIC MANUFACTURING PROCESS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction : Classification of Manufacturing Process, Composition , Properties and uses of wrought iron, cast iron, Malleable iron ,Carbon and alloy steels, Copper, Aluminum, lead, brass, bronze, duralumin, bearing metals, high temperature metals , Properties of metals: Strength , Elasticity, Stiffness , Plasticity, Malleability , Ductility, Brittleness, Toughness, Hardness, Impact Strength, Fatigue.

UNIT II

Metal Casting: Scope of moulding, moulding sands, Principles of metal casting, pattern materials, types and allowances: classification of moulds, roles of gate, runner and riser, core, core box, and core print. Introduction of dicasting, permanent mould casting, investment casting, casting defects.

UNIT III

Metal Joining: Welding Principles, Classification of welding techniques, oxy-acetylene gas welding, Electric Arc welding, Electric resistance welding, Spot, Seam, Butt welding, Flux: composition, properties and function, Brazing and soldering, types of joints

UNIT IV

Machine Shop and Metal Cutting : Brief description of Lathe, drilling, shaping, planning, milling machines, Cutting tools used and their materials and geometry. Introduction & Profile Programming to CNC machines.

UNIT V

Carpentry: Characteristics of Soft Wood & Hard Wood, object & Methods Seasoning. Cutting, Drilling, Boring, Striking, Miscellaneous & Shaving tools. Types of Saw, Chisels & Planes.
Fitting: Operation of the Fitting Shop. Type of Vices & Clamps. Marking , Cutting, Drilling & Boring tools. Classification of Files, Hacksaw, Scrapers, Hammer, Taps, Dies, Drill, Surface Plate.

References

1.Hazra and Chowdhary (11/e), Workshop Technology (Vol 1 and 2), Media, Mumbai, 2000
2.B.S.Raghuvanshi (9/e),Workshop Technology (Vol 1 and 2), Dhanapat Rai, Delhi, 2001
3.Lindeberg Ray A, (4/e), Process & Materials of Manufacturing, PHI, New Delhi, 1995
4.Degarmo, Materials and Processes in Manufacturing, PHI, New Delhi, 2000
5.Begmen , Manufacturing Processes

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EPH 151/ EPH 251

DSC06 LAB-ENGINEERING PHYSICS LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. To determine the value of Stefan's constant by electrical method.
2. To determine the focal points, principal points and focal length of a combination of lenses by Newton's method and its verification.
3. To determine the focal length of a combination of two lenses by Nodal Slide method and to locate the position of cardinal points.
4. To determine the dispersive power of the material of the given prism.
5. To determine the wavelength of spectral lines by plane transmission grating.
6. To determine the wavelength of monochromatic light with the help of Newton's ring method.
7. To determine the wavelength of monochromatic light with the help of Fresnel's Biprism.
8. To study the variation of magnetic field along the axis of the current carrying coil and then to estimate the radius of the coil.
9. To determine the e/m of electron by magnetron method.
10. To study the characteristics of a photocell.
11. To determine the value of Plank's constant by photoelectric effect.
12. To study the Energy band gap of a semi conducting sample by Four Probe method.
13. To study the Hall effect using Hall effect set up.
14. To determine the susceptibility by Quink's method.
15. To determine the specific resistance of the material of the given wire using C.F. bridge.
16. To study the nature of polarization of Laser light& to verify malus Law.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EEE 151/EEE 251

DSC08 LAB-BASIC ELECTRICAL ENGINEERING LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. Verification of Kirchoff's laws.
2. Verification of Thevenin's theorems.
3. Verification of Norton's theorem
4. Verification of Superposition theorem.
5. Verification of maximum power transfer theorem.
6. Measurement of power in three-phase circuit by two wattmeter method.
7. Determination of efficiency of a single-phase transformer by load test.
8. To perform open circuit test on single-phase transformer & find equivalent circuit parameters.
9. To perform short circuit test on single-phase transformer & find equivalent circuit parameters.
10. D.C. generator characteristics (a) Shunt generator
    (b) Series generator
    (c) Compound generator
11. Speed control of D.C. shunt generator.
12. To study running and reversing of a three-phase Induction Motor.
13. To study & calibration of a single-phase Energy Meter.
14. Calibration of voltmeter and ammeter.
15. To study of resonance in RLC circuit.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EEC 151/ EEC 251

DSC09 LAB-BASIC ELECTRONICS ENGINEERING LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. To draw the V-I characteristics of PN junction diode.
2. To draw the V-I characteristics of Zener diode.
3. To study junction diode as half wave and full wave rectifier.
4. To study junction diode as clipper and clamper.
5. To study the Zener diode as voltage regulator.
6. To draw the input and output characteristics of a transistor in CE configuration.
7. To draw the input and output characteristics of a transistor in CB configuration.
8. To find the small signal h-parameters of a transistor.
9. To study various logic gates.
10. To study Op-Amp as inverting and non- inverting amplifier.
11. To study Op-Amp as adder and subtractor.
12. To study Op-Amp as differentiator and integrator.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EHU 151/EHU 251

AECC02 LAB-TECHNICAL COMMUNICATION

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
2 0 0

Experiment related to the following :

Objective :

1. To expose the learners to English sound system and acquire phonetics skill and speech rhythm
2. To help the learners use grammar correctly
3. To train the learners to speak English, clearly, intelligently and effectively
4. To equip the learners to compete for a carrer, and enable them to function effectively in careers which demand good communicative skills

Contents :

i) Non verbal communication
- Use of hands
- Posture of shoulders
- Eye contact
- Weight of the body
- Movement of the body

ii) Applied phonetics
- Sound of English – consonants and vowels
- Phonemic transcription
- Stress, Rhythm and intonation

iii) Remedial grammar
- Some useful expression (introduction, greetings etc.) that are used frequently
- Common mistakes in the use of nouns, pronouns, adjectives, adverbs, prepositions, conjunctions
- Use of the who and whom, much and many, still and yet, so as and so that, make and do
- Tense and their use
- Confusion of participles
- Tag questions

iv) Reading and speaking skills, listening and speaking skills
- Presentation and addresses
- Group discussions
- Interviews
- Role playing

v) Reading and writing skill, listening and writing skills
- Letter writing – formal and informal
- Real life social situations
- Curriculum vitae
- Agenda, notice and minutes

Distribution of marks :

1. Exercise : 30 marks
2. Viva voce/ speech : 30 marks
3. Record : 10 marks
   Total : 70 marks

List of recommended books (latest edition unless specified)

1) Balasubramaniam, T. *Phonetics for Indian Students*. Macmillan India Ltd.
2) Daniel, Jones. English Pronouncing Dictionary. Cambridge University Press.
3) Oxford Advanced Learners' Dictionary.
4) Taylor, Grant "conversation practice", Tata Mc Graw Hills, new Delhi
5) F.T.A. Wood, "Remedial English Grammar", macmillan India Ltd.
6) Berry, Thomas Elliot, "The Most Common Errors in English Usage" Tata Mc Graw Hills, New Delhi
7) Krishnaswamy, N. "*Modern English*. Macmillan India Ltd.
8) Desmond, "people watching"

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EME 152/EME252

DSC11 LAB-WORKSHOP PRACTICE

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

Carpentry Shop

1. To prepare a half T joint of given dimensions.
2. To prepare a wooden pattern of given dimensions.

Moulding Shop

3. To prepare a mould of half bearing.
4. To prepare a mould using core.

Metal Joining.

5. To prepare a butt joint of MS strips using Arc welding.
6. To prepare a T joint of MS strips using Oxy Acetylene gas welding.

Fitting Shop

7. To prepare a rectangular piece with slant edge of given size from M.S. flat.

Machine Shop

8. To prepare a job on Lathe machine of given shape and size.
9. To prepare a job on Shaper machine of given shape and size.
10. To prepare a job on Milling machine of given shape and size.
11. To prepare a job on CNC train master of given shape and size.
12. To prepare a job on drilling machine of given shape and size.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 301 / ECS 405
DSC12-DATA STRUCTURE - I

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Algorithm Design and Data Structure: Design & analysis of algorithm, Top-down and Bottom-up approaches to algorithm design, Analysis of Algorithm, Frequency count, Complexity measures in terms of time and space.
Arrays, Stacks and Queues : Representation of Array (Single & Multi Dimensional Arrays), Address Calculation using column & row major Ordering, Array and linked representation and implementation of queues. Applications of Arrays, Stacks & Queues; Conversion from Infix to Postfix & Prefix and Evaluation of Prefix expressions using Stack**,** Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque and Priority Queue

UNIT II

Linked List: Representation and Implementation of Singly Linked List, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and Deletion to/from Linked List, Insertion and Deletion Algorithms, Doubly linked List, Linked List in Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

UNIT III

Trees: Basic terminology, Binary Trees, Binary Tree Representation, Algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked representation of Binary trees, Traversing Binary trees.
Binary Search Tree: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of search algorithm, Path Length, AVL Tree, B-trees.

UNIT IV

Graphs: Introduction, Definition,Directed and undirected graph,Degree, incidence, adjacency, path, cycle, connected and unconnected graph, complete graph, connectedness, weighted graph, subgraph, spanning trees.

Graph Representation: Adjancency matrix, adjacency list, Incidence matrix. Traversal of graph: Depth first search, Breadth first search. Shortest path problem, Dijkstra's algorithm. Minimum spanning tree,kruskal's algorithm, prim's algorithm.

UNIT V

Searching and Hashing: Sequential Search, Comparison and Analysis, Hash table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.
Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting.

References

1. Horowitz and Sahani, Fundamentals of Data Structure, Galgotia.
2. R.Kruse etal, Data Structures and Program Design in C, Pearson Education.
3. A M Tenenbaum etal, Data Structure using C & C++, PHI.
4. Lipschutz, Data Structure, TMH.
5. K. Loudon, Mastering Algorithms with C, Sheoff Publisher & Distributors.
6. Bruno R Preiss, Data Structures and Algorithms with Object Oriented Design Pattern in C++, John Wiley & Sons, Inc.
7. Yashwant Kanetkar, Pointers in C, BPB

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EMA 301
DSC13-ENGINEERING MATHEMATICS – III

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Laplace Transform: Laplace transform of elementary functions. Shifting theorems. Transform of derivatives. Differentiation and Integration of transforms. Heaviside unit step and Dirac Delta functions. Convolution theorem. Solution of ordinary linear differential equations used in Mechanics, Electric circuits and Bending of beams.

UNIT II

Fourier Transforms : Definition of Fourier transform, Fourier sine and cosine transforms. Fourier integral formula. Applications to solutions of boundry value problems.

UNIT III

Z - transform : Definition, Linearity property, Z - transform of elementary functions, Shifting theorems, Initial and final value theorem, Convolution theorem, Inversion of Z - transforms, Solution of difference equations by Z - transforms.

UNIT IV

Functions of a Complex Variable - I : Analytic functions, C-R equations and harmonic functions, Line integral in the complex plane, Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic functions, Liouville's theorem.

UNIT V

Functions of a Complex Variable - II : Representation of a function by power series, Taylor's and Laurent's series, Singularities, zeroes and poles, Residue theorem, evaluation of real integrals of type $\int_o^{2\pi} f(\cos\theta, \sin\theta)d\theta$ and $\int_{-\infty}^{\infty} f(x)/F(x)dx$, Conformal mapping and bilinear transformations.

References

1. Prasad C., Advanced mathematics for Engineers, Prasad Mudranalaya
2. Schaum outline Series, Integral Transform,TMH
3. Grewal B.S., Higher Engineering Mathematics, Khanna, New Delhi, 2000
4. Brancewel, Fourier Transforms and their applications, McGraw
5. Kreyszig E., Advanced Engineering Mathematics, John Wiley, New York, 1999

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 302

DSC14-COMPUTER ARCHITECTURE

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Register Transfer Language, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Micro-operation, Arithmetic Logic Shift Unit, Arithmetic Algorithms (addition, subtraction, Booth's Multiplication), IEEE standard for Floating point numbers.

UNIT II

Control Design: Hardwired & Micro Programmed Control Unit, Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Multiple-Bus organization, Microinstruction, Microprogram sequencing, Wide-Branch addressing, Microinstruction with Next-address field, Prefetching Microinstruction.

UNIT III

Processor Design: Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer (RISC), Complex Instruction Set Computer (CISC).

UNIT IV

Input-Output Organization: I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Direct Memory access, Input-Output processor, Serial Communication.

UNIT V

Memory Organization: Memory Hierarchy, Main Memory (RAM and ROM Chips), organization of 2D, Auxiliary memory, Cache memory, Virtual Memory, Memory management hardware.

References

1. M. Mano, Computer System Architecture, PHI
2. Vravice, Zaky & Hamacher, Computer Organization, TMH Publication
3. Tannenbaum, Structured Computer Organization, PHI
4. Stallings, Computer Organization, PHI
5. John P.Hayes, Computer Organization, McGraw Hill

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EEC 302/ EEC 506

DSC15-DIGITAL ELECTRONICS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Number System: Representation of negative numbers, 9's and 1's complement, 10's and 2's complement, arithmetic using 2's complement. BCD Code, Gray Code, Excess-3 Code, Introduction to Boolean algebra, Truth table verification of various gates, Realization of Switching functions with gates.

UNIT II

K- Map: Representation up to 4 variables, simplification and realization of various functions using gates, Tabular Method, Combinational logic and design procedure.

UNIT III

Combinational Logic Circuits: Arithmetic circuits, Half and Full adder, Subtractors, BCD adders, Code Conversion, 4 bit Magnitude Comparator (IC -7485), Cascading of IC 7485, Decoder, Multiplexer, Demultiplexers, Encoders.

UNIT IV

Sequential Logic Circuits: Flip Flops, S-R latch, gated latches, Edge triggered Flip Flops, Master-slave Flip Flops, Conversion of flip flops, Analysis of clocked sequential circuits, Design of synchronous circuits, State transition diagram, state reduction and assignment.

UNIT V

Counters: Design of Asynchronous and Synchronous Counters, Two bits & four bits up & down counters and their design, Shift registers, Serial & Parallel data transfer, Shift left/Right register, Shift Register applications.

Text Book

M.Morris Mano, Digital Design, PHI

Reference Books

1. R.P.Jain, Modern Digital electronics, TMH
2. A.Anand Kumar, Fundamentals of Digital Circuits, PHI
3. Lee S.C, Modern Switching Theory and Digital design, PHI
4. Greenfield J.D., Practical Digital design using ICs, John Wiley.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 303
DSC16-SOFTWARE ENGINEERING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: System definition and concepts -Characteristics and types of system, Manual and automated systems. Real-life Business sub-systems -Production, Marketing, Personal, Material, Finance. Systems models types of models - Systemsenvironment and boundaries, Real-time and distributed systems, Basic principles of successful systems.

Systems Analyst: Role and need of systems analyst,Qualifications and responsibilities ,Systems Analyst as an agent of change,

UNIT II

System Development Cycle : Introduction to systems development life cycle (SDLC), Various phases of development - Analysis, Design, Development, Implementation, Maintenance, Systems documentation considerations -Principles of systems documentation , Types of documentation and their importance,Enforcing documentation discipline in an organization .

System Planning: Data and fact gathering techniques: Interviews, Group communication, Presentations, Site visits. Feasibility study and its importance, Types of feasibility reports System Selection plan and proposal Prototyping. Cost-Benefit and analysis -Tools and techniques

UNIT III

Scope and classification of metrics, measuring process and product attributes, direct and indirect measures, Reliability, Software quality assurance, Standards

UNIT IV

Software testing fundamentals, Software testing strategies, Black box testing, white-box testing, System Testing and other testing techniques, Testing tools, test case management, software maintenance organization, maintenance report, types of maintenance.

UNIT V

Need for SCM, version control, SCM process, Software configuration items, taxonomy, CASE repository, Features.

References

1. Whitten, Bentaly and Barlow, System Analysis and Design Methods, Galgotia Publication.
2. Elias M. Award, System Analysis and Design, Galgotia Publication
3. Jeffrey A. Hofer Joey F. George Joseph S. Valacich, Modern System Analysis and Design, Addison Weseley.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EEE 302 / EEE 403
DSC17-NETWORK ANALYSIS AND SYNTHESIS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Graph Theory : Graph of a Network, definitions, tree, co tree , link, basic loop and basic cut set, Incidence matrix, cut set matrix, Tie set matrix Duality, Loop and Node methods of analysis.

UNIT II

Network Theorems: Applications to ac networks- Super-position theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem, Reciprocity theorem. Millman's theorem, compensation theorem, Tellegen's theorem.

UNIT III

Network Functions: Concept of Complex frequency , Transform Impedances Network functions of one port and two port networks, concept of poles and zeros, properties of driving point and transfer functions, time response and stability from pole zero plot, frequency response and Bode plots.

UNIT IV

Two Port Networks: Characterization of LTI two port networks ZY, ABCD and h parameters, reciprocity and symmetry. Inter-relationships between the parameters, inter-connections of two port networks, Ladder and Lattice networks. T and Π Representation.

UNIT V

Network Synthesis: Positive real function; definition and properties; properties of LC, RC and RL driving point functions, synthesis of LC, RC and RL driving point immittance functions using Foster and Cauer first and second forms.

Filters: Image parameters and characteristics impedance, passive and active filter fundamentals, low pass, high-pass, band pass, band elimination filters.

Text Books

1. M.E. Van Valkenburg, Network Analysis, Prentice Hall of India.
2. D. Roy Chaudhary, Networks and Systems, Wiley Eastern Ltd.
3. Donald E. Scott, An Introduction to Circuit analysis: A System Approach, McGraw Hill Book Company.

Reference Books

1. M.E. Van Valkenburg, An Introduction to Modern Network Synthesis, Wiley Eastern Ltd.
2. W.H. Hayt & Jack E-Kemmerly, Engineering Circuit analysis, Tata McGraw Hill.
3. Soni, Gupta , Circuit Analysis, Dhanpat Rai & Sons.
4. A. Chakrabarti, Circuit Theory, Dhanpat Rai & Co.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 351/ ECS 454
DSC12 LAB- DATA STRUCTURE - I LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Write Program in C

1. Array implementation of Stack.
2. Array implementation of Queue.
3. Array implementation of Circular Queue.
4. Implementation of Linked List.
5. Implementation of Stack using list.
6. Implementation of Queue using list.
7. Implementation of Binary Search Tree, Tree Traversal.
8. Insertion and Deletion in BST.
9. Implementation of Searching and Sorting Algorithms.
10. Sort a double linked list.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS353
DSC18 LAB- SIMULATION LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Hands on experience on simulation softwares.

The study has to study different simulation softwares & do initial level examples of it.
The simulations may vary as per technology
For example:

1. Cloud Sim
2. Grid Sim
3. Petrinets
4. NS2

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 352

DSC14 LAB-COMPUTER ARCHITECTURE LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Perform Following

1. Identification of various components of computers.
2. Inter transfer of data among four 7495 registers through a common bus – implementation on Bread Board.
3. Creating and rectifying the common faults occurring in a computer system – implementation on computer system kit.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EEC 352

DSC15 LAB- DIGITAL ELECTRONICS LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENTS

1. To verify the truth tables of various types of gates using IC 7400.
2. To verify the truth tables of Multiplexer & also implement a function using Multiplexer.
3. To design & verify the truth table of half & full adder.
4. To design & verify the truth table SR flip-flop using NOR/NAND gates.
5. To design & verify the truth table JK flip-flop using NOR/NAND gates.
6. To design & study Counters .
7. To design & study Shift registers.
8. To verify the truth tables of de Multiplexer.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 401
DSC19- SOFTWARE PROJECT MANAGEMENT

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Project Management Fundamentals- Basic Definitions, Project Stakeholders and Organizational, Influences on Project Management, Project Management Processes, Project Initiating Processes

UNIT II

Planning and Resourcing a Project - Identifying Requirements, Creating the Work Breakdown structure, Developing the Project Schedule, Developing a Project Cost Estimate, Planning Quality, Organizing the Project Team, Planning for Potential Risks

UNIT III

Executing and Managing a Project -

Project Executing Processes- Acquiring and Developing the Project Team, Managing the Project Team, Managing Stakeholder Expectations, Directing and Managing the Project while assuring Quality

UNIT IV

Project Monitoring and Controlling Processes - Verifying and Controlling Scope, Managing Schedule and Cost, Controlling Quality, Monitoring and Controlling Risks

UNIT V

Integrated Change Control, Project Closing Process - Closing a Project

References

1. Software Engineering - Somerville (Addison Wesley) .
2. Software Engineering-Pressmen.

Tools
Rational Team Concert, MS Project

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EMA 401
DSC20- DISCRETE MATHEMATICS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Sets and Propositions: Introduction. Combination of sets, Finite and Infinite sets, Uncountably Infinite sets, Mathematical Induction, Principle of Inclusion and Exclusion. Propositions.

UNIT II

Relations and Functions : Introduction. Relation, Properties of primary relations, Equivalence relations and partitions, Partial ordering relations and lattices. Functions and the Pigeonhole principle.

UNIT III

Graphs and Planar Graphs: Basic terminology, Multigraphs and weighted graphs, Paths and circuits, Shortest paths in weighted graphs. Eulerian Paths and circuits, Hamiltonian paths and circuits, Planar Graphs.

UNIT IV

Trees and Cut Sets: Trees, Rooted trees, Path lengths in rooted trees, Prefix codes, Spanning trees and cut sets. Minimum spanning trees.

UNIT V

Generating Functions and Recurrence Relations: Introduction. Manipulation of numeric Functions, Generating functions, Recurrence relations, Linear Recurrence relations with constant coefficients. Homogeneous solutions, Particular solutions, Total solutions. Solution by the method of generating functions.

References

1. Kenneth H. Rosen, “Discrete Mathematics and its applications”, McGraw Hill.
2. Liu,C.L(2/e)., Elements of Discrete Mathematics, TMH, New Delhi, 2000
3. Tremblay J.P. and Manohar R., Discrete Mathematical structures with application to Computer Science, McGraw, Singapore, 1988
4. Kolman & Busby(3/e), Discrete Mathematical structures for Computer Science, PHI, New Delhi, 2001

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 402
DSC21- OPERATING SYSTEM

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction : Operating System, Single Processor systems, Multiprocessor Systems , Clustered Systems, Mainframe Systems, Desktop Systems, , Distributed Systems, Real Time Systems, System Components, Handheld Systems, Operating System Services, System Calls, System Programs, System Structure, Operating System Design and Implementation.

UNIT II

Process Management : Process Concept, Process Scheduling, Cooperating Processes, Interprocess Communication, Threads, Overview of Multithreading Models,CPU Scheduling, Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real Time Scheduling, Algorithm Evaluation.

UNIT III

Process Synchronization & Deadlocks: The Critical Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Deadlocks, System Model, Deadlock Characterization, Methods for handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

UNIT IV

Memory Management & Virtual Memory: Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory, Demand paging, Page Replacement, Thrashing, Allocation of Frames

UNIT V

File System & Secondary Storage Structure: File Concepts, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free Space Management, Recovery, Disk Structure, Disk Scheduling, Disk Management, Swap Space management.

References

1 Silberschatz, Galvin, Gagane, Operating System Concepts. Wiley India Edition.
2 William Stallings, Operating System, Pearson Prentice Hall.
3 D.M.Dhamdhere, Operating Systems, TMH.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EMA 402
DSC22- NUMERICAL ANALYSIS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Errors and Roots of Equations: Absolute, relative, round-off and truncation errors. Significant digits. Algebraic and Transcendental Equations, Numerical solution, Method of bisection, Newton-Raphson method, Direct iterative method, convergence.

UNIT II

Linear Simultaneous Algebric Equations: Method of Gauss elemination, LU - decomposition Jacobi's and Gauss- Seidal methods, Largest eigen value and corresponding eigen vector (Powers method).

UNIT III

Interpolation : Finite difference operators, Greogory- Newton, Stirling, Bessel and Lagrange's formula. Errors in interpolation. Divided differences.

UNIT IV

Numerical Differentiation and Integration: Differentiation, Newton- Cotes formula of Inegration, Gaussian Quadrature formula. Extension of Trapezodial and Simpson's rules to multiple integration.

UNIT V

Ordinary Differential Equations: Picard, Taylor, Eulers, Runge-Kutta, Adams-Bash forth and Milne's method. System of ordinary differential equations, Partial Differential Equations: Numerical solutions of Laplace and Poisson equations by finite difference method.

References

1. Jain M.K, Iyengar S.R.K., Jain R.K., Numerical Methods for scientific & Engineering Computation, Wiley ,1987
2. Grewal, B.S., Numerical Methods in Engineering & Sciences, Khanna, New Delhi,
3. Sastry B., Introductory Method of Numerical Analysis, PHI
4. Flowers, Numerical Methods in C++, Oxford
5. Gerald C.F. (5/e), Applied Numerical Analysis, Addison Wesley, 1994

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 403
DSC23- DATABASE MANAGEMENT SYSTEM

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: An overview of Database Management System, Database System Vs File System, Database system concept and architecture, data models schema and interfaces, data definitions language, DML, Overall Database Structure. Data Modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagram to tables, extended ER model, relationship of higher degree.

UNIT II

Relational Data Model and Language: Relational Data Model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain Constraints, relational algebra, relational calculus, tuple and domain calculus.

Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub-queries, Aggregate functions, Insert, update and delete operations, Joins, Union, Intersection, Minus.

UNIT III

Data Base Design & Normalization: Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, loss less join decomposition, normalization using FD, MVD and JDs, alternative approaches to database design.

UNIT IV

Transaction Processing Concepts: Transaction system, Testing of serializability, Serializability of schedules, conflict & view Serializable schedule, recoverability, Recovery from transaction failures, log based recovery, deadlock handling.

UNIT V

Concurrency Control Techniques: Concurrency Control, Locking Techniques for Concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi-version schemes, Recovery with concurrent transaction, Transaction processing in Distributed system, Data fragmentation, Replication and allocation techniques for distributed system, overview of concurrency control and recovery in distributed database.

References

1. Date C.J., An Introduction to Database System, Addision Wesley.

2. Korth, Silbertz, Subaeshan, Database Concepts, McGraw Hill.

3. Elmasri, Navathe, Fundamentals of Database Systems, Addision Wesley.

4. Paul Beynon Davies, Database System, Palgrave Macmillan.

5. Bipin C. Desai, An Introduction to Database System, Galgotia Publication.

6. Majumdar & Bhattacharya, Database Management System, TMH.

7. Ramakrishnan, Gehrke, Database Management system, McGraw Hill.

8. Bharti P.K., An Introduction to Database Systems, JPNP.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 404/ECS 505

DSC24- OBJECT ORIENTED PROGRAMMING USING C++

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: Review of C, Difference between C and C++, Cin, Cout, new ,delete operators, abstraction, encapsulation, inheritance, polymorphism, Structured versus object-oriented development, elements of object-oriented programming.

Class Overview: Class specification, class objects, accessing class members, defining member functions, outside member functions as inline, accessing member functions within a class, data hiding, access boundary of objects revisited, empty classes, pointers within a class, passing objects as arguments, returning objects from functions, friend functions and friend classes, constant parameters and member functions, structures and classes, static data and member functions, class, objects and memory resource, class design steps.

UNIT II

Object Initialization and Cleanup: Class revisited, constructors, parameterized constructors, destructor, constructor overloading, order of construction and destruction, constructors with default arguments, dynamic initialization through constructors, constructors with dynamic operations, copy constructor, static data members with constructors and destructors.

Operator Overloading: Introduction, over loadable operators, unary operator overloading, operator keyword, operator return values, limitations of increment/decrement operators, binary operator overloading, arithmetic operators, overloading of new and delete operators, data conversion, conversion between basic data types, conversion between objects and basic types, conversion between objects of different classes, overloading with friend functions.

UNIT III

Inheritance : Introduction, class revised, derived class declaration, forms of inheritance, inheritance and member accessibility, constructors in derived classes, destructors in derived classes, constructors invocation and data members initialization, overloaded member functions, multilevel inheritance, multiple inheritance, hierarchical inheritance, multi-path inheritance and virtual base classes, hybrid inheritance.

UNIT IV

Virtual Functions and Classes: Introduction, need for virtual functions, static and dynamic binding, pointer to derived class objects, definition of virtual functions, pure virtual functions, abstract classes, virtual destructors.

Generic Programming with Templates: Introduction, function templates, overloaded function templates, multiple arguments function templates, user defined template arguments, class templates, class template with overloaded operators.

UNIT V

Streams Computation with Streams: Predefined console streams, hierarchy of console stream classes, unformatted I/O operations, formatted console I/O operations, manipulators, custom/user-defined manipulators, stream operator with user-defined classes.

Stream Computation with Files: Introduction, hierarchy of file stream classes, opening and closing of files, testing for errors, file modes, file pointers and their manipulators, sequential access to a file, ASCII and binary files, saving and retrieving of objects, file input/output with stream class, random access to a file, in-memory buffers and data formatting, error handling during file manipulations, filter utilities.

Exception Handling: Introduction, error handling, exception handling model, exception handling constructs.

References

1. E.Balagurusamy, Object Oriented Programming with C++, TMH
2. R.Lafore, Object Oriented Programming using C++, Galgotia
3. S.B.Lippman & J.Lajoie, C++ Primer, Addison Wesley
4. G.Booch, Object Oriented Design & Applications, PHI

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 451

DSC23 LAB- DBMS LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Perform following queries in IBM-DB2

1. Create table using sql commands.

2. Perform insertion, updation and deletion on tables.

3. Perform select queries on table.

4. Perform primary key, Candidate key and not null constraints.

5. Perform joins (Outer Joins).

6. Nested Queries.

7. Union, Intersection and except operations.

8. Foreign Key and Referential Integrity Constraints.

9. Create View of tables.

10. Grant and revoke permissions on tables.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
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4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 452/ECS 554

DSC24 LAB- OBJECT ORIENTED PROGRAMMING LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Programming exercise on the following topics.

Functions in C++, parameter passing, call and return by reference, friend functions, inline functions, function overloading.

Classes and objects: arrays within a class, memory allocation for objects, static members, returning objects, constructor and destructors, operator overloading.

Inheritance: derived classes, single and multiple inheritance, hierarchical inheritance, constructors in derived classes, classes containing objects of other classes.

Polymorphism: pointers to objects, this pointer, pointer to derived classes, virtual functions.

Templates: class and function templates, template arguments, exception handling; use of files, learning to use Visual C++ environment.

NOTE

1. In practical examination the student shall be required to perform one experiment.
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3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EMA 452

DSC22 LAB- NUMERICAL ANALYSIS LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

List of Experiment :

Roots of Algebraic and transcendental equations

1. Bisection method
2. Newton Raphson method
3. Direct iterative method

Solutions of simultaneous equations-

4. Gauss Elimination method
5. LU – Decomposition method
6. Jacobi method
7. Gauss Seidel method

Interpolation

8. Lagrange's Interpolation method
9. Newton Forward's interpolation method and Newton Backward's interpolation method

Numerical differentiation and integration

10. first and second order differential coefficient
11. Trapezoidal formula composite
12. Simpson's 1/3 formula composite
13. Simpson's 3/8 formula
14. Lagendre Gaussian Quadrature

Solution of differential equations

15. Picards method
16. Euler’s method
17. Runge-Kutta method
18. Milne’s method

Statistics

19. Method of least square curve fitting
20. Regression analysis
21. Linear square fit and polynomial fit.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 453

DSC21 LAB- OPERATING SYSTEMS LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Perform Following Programs in C

1. Write a program to perform FCFS Scheduling Algorithm.
2. Write a program to perform SJF Scheduling Algorithm.
3. Write a program to perform SJF Preemptive Scheduling Algorithm.
4. Write a program to perform SJF Non Preemptive Scheduling Algorithm.
5. Write a program to perform Priority Scheduling Algorithm.
6. Write a program to perform Round Robin Scheduling Algorithm.
7. Write a program to perform FIFO Page Replacement algorithm.
8. Write a program to perform LRU Page Replacement algorithm.
9. Write a program to perform Optimal Page Replacement algorithm.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 501
DSC25- JAVA PROGRAMMING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction : Creation of Java, importance of Java to internet, byte code, OOP Principles, Encapsulation, Inheritance and Polymorphism, data types, variables, declaring variables, dynamic initialization, scope and life time of variables, arrays, operators, control statements, type conversion and casting, compiling and running of simple Java program.

Classes and Objects : Concepts of classes and objects, class fundamentals Declaring objects, assigning object reference variables, introducing methods,constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing – call by value, recursion,nested classes and inner classes, exploring the String class.

UNIT II

Inheritance : Basic concepts, member access rules, usage of super key word, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, the Object class.

Packages and Interfaces : Defining, Creating and Accessing a Package, Understanding classpath, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT III

Exception Handling and Multithreading : Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle,creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, daemon threads,deadlocks, thread groups.

UNIT IV

Applets : Concepts of Applets, differences between applets and applications,life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Event Handling : Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

UNIT V

AWT : Concepts of components, container, panel, window, frame, canvas, AWT Controls - Buttons, Labels, Text fields, Text area, Check boxes, Check box groups, Lists, Choice, Scrollbars, Menus, Layout Managers – Flow, Border,Grid.
Swing : JApplet, JFrame and JComponent, Icons and Labels, Handling threading issues, text fields, Buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

References

1. Herbert Schildt, The Complete Reference Java J2SE 5th Edition, TMH Publishing Company Ltd.
2. Cay Horstmann, ig Java 2nd Edition, John Wiley and Sons.
3. H.M.Dietel and P.J.Dietel, Java How to Program, Pearson Education/PHI
4. Cay.S.Horstmann and Gary Cornell, Core Java 2, Vol 1, Fundamentals, Pearson Education.
5. Cay.S.Horstmann and Gary Cornell, Core Java 2- Advanced Features, Pearson Education.
6. Iver Horton, Beginning in Java 2, Wrox Publications.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 502

DSC27- DESIGN AND ANALYSIS OF ALGORITHMS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction : Definition and characteristics of Algorithms; Analyzing algorithms; Program performance: time and space complexity, Asymptotic notation, complexity analysis. Recurrence equations and their solutions.

UNIT II

Algorithmic Techniques: Algorithm design strategies such as recursion, Divide and conquer, greedy method, dynamic programming, back tracking, branch and bound examples, applications and analysis.

UNIT III

Search Trees: Balanced trees – AVL and 2-3 trees, Algorithms for building and maintaining these trees; B-trees- m-way search trees, insertions and deletion for B-trees, optimal search trees- optimality Criterion, insertion deletions, analysis.

UNIT IV

Graph Algorithms: Search methods- DFS and BFS, Spanning trees, Biconnectivity, Minimum cost spanning trees- Kruskal's , Prime's and Sollin's algorithms; path finding and shortest path algorithms; topological sorting; Bipartite graphs

UNIT V

Infeasibility: P and NP classes; NP-hard problems Parallel algorithms: Introduction, data and control parallelism, parallel algorithms for matrix multiplication; embedding of problems graphs into processor graphs, load balancing and scheduling problems.

References

1. Sahni S, Data structures, Algorithms and applications in C++ , McGraw Hill
2. Aho, A.V., Hopcroft, J.E. & Ullman, J.D, The Design and Analysis of Computer Algorithms, PHI
3. Mchugh J.A., Algorithmic Graph Theory, PHI
4. Quinn M.J., Parallel Computing Theory & Practice, McGraw Hill
5. Goodman, S.E. & Hedetniemi, Introduction to the Design and Analysis of Algorithms, Mc-Graw Hill

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 503
DSC29-COMPUTER GRAPHICS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: Graphic displays: Random scan displays, raster scan displays, Frame buffer and video controller, points and lines, Raster and Random scan-Line and circle drawing algorithms-Polygon filling.

UNIT II

Curves, Surfaces and Solids: Clipping-Color table-Animation using Colour table-Anti aliasing methods-Representing curves, Surfaces and solids-B-splines-Bezier curves-Quadtree and octree-Geometric model-Fractals-Hierarchical model.

UNIT III

Transformations: 2D transformations-3D transformations-perspective viewing-Animation of wire frame models

UNIT IV

Hidden Surface Elimination: Hidden line elimination-Hidden surface elimination-Painter's algorithm-Scan the algorithm-Octree method-Z- buffer-Ray tracing

UNIT V

Color Models: Chromaticity diagram-RGB, CMY, HSV, HLS, CIE models-Realism in rendering, halving-Illumination and shading-Gouraud and Phong shading

References

1. Hearn D and Baker M.P., Computer Graphics, Second Edition, PHI.

2. Foley J.D., Van Dam A, Fiener S.K. and Hughes J.F., Computer Graphics, Addison Wesley.

3. Newman W.M. and Sproull R.F., Principles of Interactive Computer Graphics, Tata McGraw Hill Publishing Company Limited.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 504/ ECS 705
DSC30- COMPUTER NETWORK

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction : Computer Network & its uses, OSI reference model, TCP/IP Reference Model, ARPANET, Protocols, Routers, Switches, Hubs, Bridges and Repeaters.

The Physical Layer: Transmission media: Twisted pair, Baseband and Broadband coaxial cable, Fiber optics; Wireless Transmission: Radio transmission, Microwave transmission, Infrared and light wave transmission; ISDN: services and architecture.

UNIT II

The Data Link Layer: Design Issues: Services provided to other Layer, framing, Error control, Flow control; Error detection and Correction; Simplex, Sliding window protocol, Using Go-Back n, Stop & Wait Protocol ARQ.

The Medium Access Sub Layer: Static and Dynamic Channel Allocation in LANs and MANs; IEEE standard 802.3, 802.4, 802.5; CSMA.

UNIT III

The Network Layer: Network layer design issues, Shortest path routing, Flooding, flow- based routing, Broadcast routing, Congestion control and prevention policies; Traffic Shaping, Internetworking : connectionless Interworking, IP addressing, IPv4, Fragmentation.

UNIT IV

The Transport Layer: QOS, The transport service; Transport protocols: Addressing, Establishing and releasing a connection; TCP/UDP header**.**

Session Layer-RPC, Synchronization, dialog management.

UNIT V

The Application Layer: Network Security, FTP, SNMP, Telnet, E- mail, Multimedia, WWW, DNS, SMTP.

Presentation Layer: ASN, data compression, encryption.

References

1. Andrew S. Tanenbaum (3/e), Computer Networks, PHI
2. Frouzan , Data Communications & Networking(3/e, 4/e)
3. W.Stallings (5/e), Data and Computer Communications, PHI
4. Douglas E.Comer (3/e), Interworking with TCP/IP,Principles, Protocols & Architecture
5. D. Minoli, Internet & Intranet Engineering, TMH

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

EEC 505/EEC402/EEC605

DSC28- MICROPROCESSOR AND MICROCONTROLLER

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Microcomputers and microprocessors; 8-bit microprocessors; Instructions and timings, 8085 instruction set and programming, stacks subroutines.

UNIT II

Interrupt structure and I/O techniques; Interfacing concepts and devices; Programmable interfacing devices; Serial I/O; 16-bit microprocessors.

UNIT III

Architecture of 8086, Addressing modes, overview of arithmetic and looping instructions in 8086; Micro controllers and their applications.

UNIT IV

Simple experiments on 8085 programming using kit; Interfacing of switches and LED's; Interfacing of ADC and DAC; Use of programmable peripheral interfaces.

UNIT V

Use of counters and timer chips; Interfacing of keyboard and display controller; Serial communication; Interfacing of printer; Programming of 8086 using kit.

Books Recommended

1. Gaonkar R.G.---Microprocessor Architecture, Programming & Application-Wiely Eastern ltd.
2. Ram, B.---Microprocessor and Application-Dhanpatrai Pub.
3. Mathur, A.P.---Introduction to Mircroprocessor.
4. Short, K.L.---Microprocessors and Programmed Logic-Prentice hall.
5. Leventhal, L.A.---Introduction to Microprocessors, software, hardware, programming-Prentice Hall, Inc.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 505
DSC26-CLOUD COMPUTING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Overview of cloud computing
What is a cloud, Definition of cloud , Definition of cloud ,characteristics of cloud ,Why use clouds, How clouds are changing , How clouds are changing , Driving factors towards cloud , Comparing grid with cloud, Public clouds (commercial)

UNIT II

Cloud computing concepts
Concepts of cloud computing, Cloud computing leverages the Internet ,Positioning cloud to a grid infrastructure, Elasticity and scalability, Virtualization, Characteristics of virtualization, Benefits of virtualization, Virtualization in cloud computing , Hypervisors , Multitenancy, Types of tenancy, Application programming interfaces (API), Billing and metering of services , Economies of scale, Management, tooling, and automation in cloud computing , Management: Desktops in the Cloud, Security

UNIT III

Cloud service delivery
Cloud service , Cloud service model architectures, Infrastructure as a service (IaaS) architecture , Infrastructure as a service (IaaS) details, Platform as a service (PaaS) architecture, Platform as a service (PaaS) details, Platform as a service (PaaS) , Examples of PaaS software, Software as a service (SaaS) architecture, Software as a service (SaaS) details , Examples of SaaS applications , Trade-off in cost to install versus , Common cloud management platform reference architecture: Architecture overview diagram, Common cloud management platform

UNIT IV

Cloud deployment scenarios
Cloud deployment models, Public clouds, Hybrid clouds, Community , Virtual private clouds, Vertical and special purpose, Migration paths for cloud , Selection criteria for cloud deployment, Case study example: IBM ITE

UNIT V

Security in cloud computing

Cloud security reference model, How security gets integrated , Cloud security , Understanding security risks , Principal security dangers to cloud computing, Virtualization and multitenancy, Internal security breaches, Data corruption or loss, User account and service hijacking, Steps to reduce cloud security breaches, Steps to reduce cloud security breaches , Reducing cloud security , Identity management: Detection and forensics, Identity management: Detection and Identity management, Benefits of identity, Encryption techniques, Encryption & Encrypting data , Symmetric key encryption, Asymmetric key encryption , Digital signature, What is SSL?

References

1. **Practices and Paradigms in Cloud Computing, Raj Kumar Buyya**
2. **IBM , Handouts**
3. **Cloud Computing, Publisher : Jones and Barret India, Author : Kris Jasma**

ECS 551
DSC25 LAB- JAVA PROGRAMMING LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Write Following Programs In Java Using RAD (Rational Application Developer)

1. Write a program in Java for illustrating overloading, over riding and various forms of inheritance.
2. Write programs to create packages and multiple threads in Java.
3. Write programs in Java for event handling Mouse and Keyboard events.
4. Using Layout Manger create different applications.
5. Write programs in Java to create and manipulate Text Area, Canvas, Scroll
6. Bars, Frames, and Menus using swing/AWT.
7. Using Java create Applets.
8. Using Java language for Client Server Interaction with stream socket connections.
9. Write a program in Java to read data from disk file.
10. Write a program to show use of swing controls.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering

EEC 553/EEC451/EEC654
DSC28 LAB- MICROPROCESSOR & MICROCONTROLLER LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

LIST OF EXPERIMENT

1. Addition of 8 bit hexadecimal numbers without carry.
2. Addition of 8 bit hexadecimal numbers with carry.
3. To calculate 2's compliments of a 8 bit number.
4. Subtraction of two 8 bit hexadecimal number.
5. Interfacing with 8255 in I/O mode & BSR mode.
6. Verification of all interrupts.
7. Multiplication of 8 bit hexadecimal number by 2.
8. Division of 8 bit hexadecimal numbers.
9. Addition of two 8 bit decimal numbers.
10. Transfer the block from one memory location to another.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

ECS 552
DSC26 LAB- CLOUD COMPUTING LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

The students shall work on simulator like Cloud Sim, Grid Sim etc and also study open Nebula/Ecucalyptus etc.
Case Study of IBM Smart Cloud.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

ECS 560
DSC31 LAB- PROJECT / SEMINAR

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Each student is required to present a Seminar on Recent Technology under the supervision of the supervisor(s). The seminar delivered on Recent Technology will be evaluated by a departmental committee chaired by H.O.D. The student shall be required to submit the data in a file used in seminar 15 days before the end of VI semester. The file shall be forwarded by H.O.D. The file of the seminar shall be evaluated by the external examiner(s). The same external examiner(s) shall hold the viva-voce examination.
The student will also have to make a small project on the assigned topic which can be carried forward to Minor / Major project.
Study of Project Management Rational Team Concert, RSA.

NOTE
1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 601
DSC32- THEORY OF COMPUTATION

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Regular Languages: FiniteState systems – Basic Definitions – Finite Automation – DFA & NFA – Finite Automaton with e-moves – Regular Expression – Equivalence of NFA and DFA – Equivalence of NFA's with and without e-moves – Equivalence of finite Automaton and regular expressions – Pumping Lemma for Regular sets – Problems based on Pumbing Lemma.

UNIT II

Context Free Languages: Context Free Grammars – Derivations and Languages – Relationship between derivation and derivation trees – ambiguity – simplification of CEG – Greiback Normal form – Chomsky normal forms – Problems related to CNF and GNF

UNIT III

Pushdown Automata: Definitions – Moves – Instantaneous descriptions – Deterministic pushdown automata – Pushdown automata and CFL - pumbing lemma for CFL - Applications of pumbing Lemma.

UNIT IV

Turing Machines: Turing machines – Computable Languages and functions – Turing Machine constructions – Storage in finite control – multiple tracks – checking of symbols – subroutines – two way infinite tape.

UNIT V

Undecidability: Properties of recursive and Recursively enumerable languages – Universal Turing Machines as an undecidable problem – Universal Languages – Rice's Theorems

References

1. J.E.Hopcroft and Jeffery D.Ullman, Introduction to Automata Theory, Languages and Computation, Narosa Publishers
2. Michael Sipser,Introduction to the Theory of Computation, Brooks/Cole Thomson Learning
3. J.C.Mortin, Introduction to languages and Theory of computation, McGraw Hill

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 602

DSC33- ENTERPRISE COMPUTING WITH JAVA

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

JDBC: The connectivity Model, JDBC/ODBC Bridge, java.sql package, connectivity to remote database, navigating through multiple rows retrieved from a database, selection ,insertion, updation and deletion in database using JDBC.

Networking and Java Library: Basics of Networking , Inetaddress, TCP/IP sockets , datagrams, using sockets and datagram sockets to transfer data.

UNIT II

Remote Method Invocation (RMI): Introduction to RMI, Defining the Remote Interface, Implementing the Remote Interface, Defining the Client, Compiling and Executing the Server and the Client.

Java Beans : Definition of java beans, Component Model, Java beans Architecture and Properties, Methods, and Events.

UNIT III

Servlets : Background, Life cycle of a servlet, Reading servlet parameters, HTTP GET Requests – Handling HTTP Post Requests, Cookies and Session Handling, HTTP Response codes, Database handling using servlets, Sharing data between different servlets.

UNIT IV

JSP: JSP overview, Problems with Servlets, JSP Processing, Setting UP the JSP Environment, Processing Input and Output, Understanding the need for JSP, Evaluating the benefits of JSP, Comparing JSP to other technologies, Installing JSP pages, Life cycle of JSP pages, Surveying JSP syntax, JSP expressions, JSP scriptlets, JSP declarations, Servlet code resulting from JSP scripting elements, Scriptlets and conditional text.

UNIT V

JSP: Using JavaBeans Components in JSP, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests and Users, Using jsp:include, jsp:forward and jsp:plugin, The Model View Controller (MVC) Architecture, Accessing a Database.

References:

1. Marty and Hall, Core Servlets and JSP, Prentice Hall and Sun Microsystems Press.
2. Complete Reference JSP, TMH
3. Deiltel & Deitel, Advanced Java, TMH
4. Developing Java Beans , Robert Englander, O'Reilly Media

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering

ECS 603
DSC34- DISTRIBUTED SYSTEMS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Characterization of Distributed Systems-Introduction-Examples-Resource Sharing and the Web-Challenges. System Models-Architectural-Fundamental. Interprocess Communication-Introduction-API for Internet protocols-External data representation and marshalling--Client-server communication-Group communication- Case study: Interprocess Communication in UNIX.

UNIT II

Distributed Objects and Remote Invocation-Introduction-Communication between distributed objects-Remote procedure calls-Events and notifications-Case study: Java RMI. Operating System Support-Introduction-OS layer-Protection-Processes and threads- Communication and invocation OS architecture.

UNIT III

Distributed File Systems-Introduction-File service architecture-Case Study:Sun Network File System-Enhancements and further developments. Name Services-Introduction-Name Services and the Domain Name System-Directory. Services-Case Study: Global Name Service.

UNIT IV

Time and Global States-Introduction-Clocks, events and process states-Synchronizing physical clocks-Logical time and logical clocks-Global states-Distributed debugging.
Coordination and Agreement-Introduction-Distributed mutual exclusion-Elections-Multicast communication-Consensus and related problems.

UNIT V

Distributed Shared Memory-Introduction-Design and implementation issues-Sequential consistency and Ivy case study Release consistency and Munin case study-Other consistency models. CORBA Case Study- Introduction-CORBA RMI-CORBA services.

References

1. George Coulouris, Jean Dollimore, Tim Kindberg, , "Distributed Systems: Concepts and Design", 4th Edition, Pearson Education, 2005.
2. A.tS. Tanenbaum and M. V. Steen, "Distributed Systems: Principles and Paradigms", Second Edition, Prentice Hall, 2006.
3. M.L.Liu, “Distributed Computing Principles and Applications”, Pearson Addison Wesley, 2004.
4. Mukesh Singhal, “Advanced Concepts In Operating Systems”, McGrawHill Series in Computer Science, 1994.
5. Nancy A. Lynch, "Distributed Algorithms", The Morgan Kaufmann Series in Data Management System, Morgan Kaufmann Publishers, 2000.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 604
DSC35- DATA STRUCTURE - II

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Structure of string storage: fixed length, variable length, linked list storage.
String operations: Indexing,concatenation, length.
Applications of string processing: Insertion, deletion, pattern matching, text formation.

UNIT II

Trees: Threaded Binary trees, Traversing Threaded Binary trees, recursive and non recursive traversal of binary tree, Efficient non recursive tree traversal algorithms, B+ Tree, B* Tree

UNIT III

Advanced Trees: Definitions Operations on Weight Balanced Trees (Huffman Trees),2-3 Trees and Red-Black Trees. Augmenting Red-Black Trees to Dynamic Order Statics and Interval Tree Applications. Operations on Disjoint sets and its union-find problem Implementing Sets. Dictionaries, Priority Queues and Concatenable Queues.

UNIT IV

Mergeable Heaps : Mergeble Heap Operations,Binomial Trees Implementing Binomial Heaps and its Operations, 2-3-4. Trees. Structure and Potential Function of Fibonacci Heap Implementing Fibonacci Heap.

UNIT V

Graph: Definitions of Isomorphism Components.Circuits,Fundamental Circuits. Cut-Vertices Planer and Dual graphs,Spanning Trees
Graph Theory Algorithms : Algorithms for Connectness, Finding all Spanning Trees in a Weighted Graph and Planarity Testing Breadth First and Depth First Search, Topological Sort, Strongly Connected Components and Aritculation Point. Min-Cut Max-Flow theorem of Network Flows. Ford-Fulkerson Max Flow Algorithms.

References

1. Narsingh Deo-Graph, Theory with Application to Engineering and Computer Science,Prentice Hall of India.
2. Baase, Computer Algorithms, Pearson Education.
3. Cormen, Introduction to Algorithms,Prentice Hall of India.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 605
DSC36- ARTIFICIAL INTELLIGENCE

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: : Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.

UNIT II

Introduction to Search: Searching for solutions, Uniformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning.

UNIT III

Knowledge Representation & Reasoning: Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.

UNIT IV

Machine Learning: Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data - Naive Bayes models.
Expert System: Existing Systems (DENDRAL, MYCIN) domain exploration Meta Knowledge, Self Explaining System

UNIT V

Pattern Recognition: Introduction to Pattern Recognition, Structured Description, Symbolic Description, Machine perception, Line Finding, Interception Semantic & Model, Object Identification, Speech Recognition. Programming Language Introduction to programming Language, LISP, PROLOG

References

1. Rich & Knight, Artificial Intelligence
2. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, Pearson Education
3. Charnick, Introduction to A.I., Addision Wesley
4. Winston, LISP, Addision Wesley
5. Marcellous, Expert System Programming, PHI
6. Elamie, Artificial Intelligence, Academic Press
7. Lioyed, Foundation of Logic Processing, Springer Verlag

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 606
DSC37- .net TECHNOLOGIES

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction , Basic Concepts and a Simple Application , Using Variables, Constants, Functions , Processing Decisions , Looping Structures and Lists , Sub Procedures, Function Procedures, Modules , Arrays, Structures, Collections

UNIT II

Windows Forms, Adding Controls, Adding an Event Handler, Adding Controls at Runtime
Attaching an Event Handler at Runtime, Menu , Multiple Document Interface, Dialog Form ,Form Inheritance, Tab-Control, Anchoring Controls, Changing the Startup Form, ListView , TreeView imageList Context Menu, TreeView, Creating Controls at run time, Creating a User Control, adding Functionality, Writing a Custom Control, Testing the Control.

UNIT III

ADO.NET Architecture, ConnectionObject, Connection String, CommandObject, DataReaders, DataSets and DataAdapters, DataTable, DataColumn, DataRow, Differences between DataReader Model and DataSet Model, DataViewObject, Working with System.Data.OleDb, Working with SQL.NET, Using Stored Procedures, Working with Odbc.NET, Using DSN Connection

UNIT IV

Creating Distributed Web Applications, XML and ADO.NET, Graphics, Printing, Reporting

UNIT V

Building ASP.NET Pages: Overview of the ASP.NET Framework , Using the Standard Controls, Using the Validation Controls, Using the Rich Controls, Designing Websites with Master Pages, Creating Custom Controls with User Controls.

References

1. “Database Programming in VB.NET”, Chittibabu Govindarajulu, Pearson
2. “Understanding .NET”, Chappell, David, Addison Wesley, 2006
3. **“**Asp.Net : A Beginners Guide”, Mercer , TMH

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 651

DSC33 LAB- ENTERPRISE COMPUTING WITH JAVA LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Perform Following In Java/Servlets/JSP Using RAD

1. Write a program to connect a java program to database.
2. Write a program to implement dedicated connection.
3. Write a program to implement non-dedicated connection.
4. Write a program to create a application using RMI.
5. Write a program to implement database application using RMI.
6. Write a program to create a new component using Java Beans.
7. Write a program to implement pass parameters in Servlets.
8. Write a program to show use of Cookies in JSP.
9. Write a program to create a database application in JSP.
10. Write a program to implement session tracking.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 652

DSC37 LAB- .net TECHNOLOGIES LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Perform Following In Java/Servlets/JSP/C#

1. Write a program to Add Control in c#.

2. Write a program to implement arrays in c#.

3. Write a program to implement Multiple Document Interface in c#.

4. Write a program to create an application using Controls at run time.

5. Write a program to create a simple ASP Page.

6. Write an application in ASP.net using standard controls.

7. Write a program to Create Distributed Web Applications.

8. Write a program to retrieve the data from the database in ADO.net.

9. Write a program for writing a Custom Control

10. Write a program to create a database application in SQL.net.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

ECS 653
DSC34 LAB- DISTRIBUTED SYSTEM LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Different Experiments of Distributed Systems to be performed.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 654

DSC35 LAB- DATA STRUCTURE – II LAB

MM : 100 **Sessional : 30**
Time : 2 hrs **ESE : 70**
L T P **Credits 2**
0 0 2

Write Program in C

1. Implementation of Weighted Balanced Trees.
2. Implementation of Red-Black Tree.
3. Implementation of Threaded Binary Tree and there Traversal.
4. Implementation of Priority Queue.
5. Implementation of Heap Tree.
6. Implementation of Graphs.
7. Implementation of Depth First Search.
8. Implementation of Breadth First Search.
9. Implementation of Hashing.
10. Graph Implementation Min. cost spanning tree, shortest path algorithm.

NOTE

1. In practical examination the student shall be required to perform one experiment.
2. A teacher shall be assigned 20 students for daily practical work in laboratory.
3. No batch for practical class shall consist of more than 20 students.
4. The number of students in a batch allotted to an examiner for practical examination shall not exceed 20 students.
5. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 701
DSC38- COMPILER DESIGN

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: What is system software. Introduction to system software. Assembler, Loader, Linker, Interpreter, Compiler.

UNIT II

Compiler Structure: Compiler and translator, various phases of compiler, pass structure of compiler, boot strapping of compiler.

Lexical Analysis: The role of lexical analyzer, a simple approach to the design of lexical analyzer, regular expressions, transaction diagram, finite state machines, Implementation of lexical analyzer, lexical analyzer generator : LEX, capabilities of lexical analyzer.

UNIT III

Basic Parsing Techniques : Top down Parser with back tracking, recursive recent parsers, predicate parsers, bottom-up parsers, Shift-reduce parsing, operator precedence parsers.

UNIT IV

Intermediate Code Generator: Different intermediate forms - Three address code, Quadruplex and triples, syntax direct translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array references in arithmetic expression, produced calls, case statement, postfix translation.

UNIT V

Code Optimization and Code Generation: Local optimization, loop, peephole optimization, basic blocks and flow graphs DAG, data flow analyzer, machine model, order of evaluation, register allocation of code selection.

Error Detection and Recovery: Lexical phases error, syntactic phase errors, semantic errors.

References

1. Alfred V Aho, Jeffrey D. Ullman, Principles of Compiler Design, Narosa.
2. V. Aho, R. Sethi and J.D. Ullman, Compiler: Principle, Techniques and Tools, AW.
3. H. C. Holub, Compiler Design in C, Prentice Hill Inc.
4. Apple, Modern Computer Implementation in C : Basic Design, Cambridge press.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
EMA 701
DSC39- OPTIMIZATION TECHNIQUES

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Linear Programming : Introduction, Construction of LP Model, Graphical ofSolution LP.Simplex Method, Introduction, Standard LP Form and its basic Solutions, Simplex Algorithm, Artificial Starting Solution, Special cases in Simplex Method, Applications.

UNIT II

Duality: Introduction, Definition of Dual Problems, Relationship between the Optimal Primal and Dual Solutions, Economic Interpretation of Duality, Dual Simplex Method, Primal Dual Computation.

UNIT III

Integer Programming : Methods of Integer Programming, Cutting-Plane Method: Fractional (Pure Integer) Method, Mixed-Cut method, Branch and Bound Technique. .

Deterministic Dynamic Programming : Introduction, Recursive Nature of Computing, Forward and Backward Recursion, Applications of Dynamic Programming in Shortest Route Problem, Cargo Loading Problem, Work Force Size Model.

UNIT IV

Transportation and Assignment Model : Definition of Transportation Model, Non Traditional Transportation Model, Transportation Algorithms, Assignments Model.

Game Theory : Minimax-Maximin criterion, Pure strategies, Mixed strategies and Expected Payoff, Concept of Dominance, Graphical Solution of m x 2 and 2 x n Games. Solution by Linear Programming method.

UNIT V

Queuing Theory : Definition of Queuing System, Characteristics of Queuing Models, Notation, Transient and Steady State of Queuing System, Birth-Death process, Pure birth & Pure Death processes, (M/M/1):(FIFO/ ∞ / ∞); (M/M/s):(FIFO/ ∞ / ∞); (M/M/1):(FIFO/N/∞) Models, Their Characteristics, State Transition Diagrams.

References

1. Taha, Hamdy A., Operations Research, (Maxwell Macmillan)
2. Kanti Swarup, P.K. Gupta, Man Mohan Operations Research, (Sultan Chand & Sons)
3. Gillet, Billy E.,Introduction to Operations Research, A Computer Oriented Algorithmic Approach (TMH)

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 702
DSC40- CRYPTOGRAPHY AND NETWORK SECURITY

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: Introduction to security attacks, services and mechanism, introduction to cryptography. Conventional Encryption: Conventional encryption model, classical encryption techniques- substitution ciphers and transposition ciphers, cryptanalysis, stereography, stream and block ciphers.

Modern Block Ciphers: Block ciphers principals, Shannon's theory of confusion and diffusion, fiestal structure, data encryption standard(DES), strength of DES, differential and linear crypt analysis of DES, block cipher modes of operations, triple DES, IDEA encryption and decryption, strength of IDEA, confidentiality using conventional encryption, traffic confidentiality, key distribution, random number generation.

UNIT II

Introduction to graph, ring and field, prime and relative prime numbers, modular arithmetic, Fermat's and Euler's theorem, primality testing, Euclid's Algorithm, Chinese Remainder theorem, discrete logarithms. Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffle-Hellman key exchange algorithm, introductory idea of Elliptic curve cryptography, Elganel encryption.

UNIT III

Message Authentication and Hash Function: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions and MACS, MD5 message digest algorithm, Secure hash algorithm(SHA).

Digital Signatures: Digital Signatures, authentication protocols, digital signature standards (DSS), proof of digital signature algorithm.

UNIT IV

Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good privacy (PGP), S/MIME.

UNIT V

IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management.

Web Security: Secure socket layer and transport layer security, secure electronic transaction (SET).

System Security: Intruders, Viruses and related threads, firewall design principals, trusted systems.

References

1. William Stallings, Cryptography and Network Security: Principals and Practice, Prentice Hall, New Jersy.
2. Johannes A. Buchmann, Introduction to Cryptography, Springer-Verlag.
3. Bruce Schiener, Applied Cryptography

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Faculty of Engineering & Technology
Computer Science & Engineering
ECS 703
DSC41- UNIX

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction : The UNIX operating system, The UNIX architecture, Features of UNIX, Locating commands, Internal and external commands, General purpose utilities – cal, date, echo, printf, bc, script, passwd, who, uname.

UNIT II

UNIX File System: File system and inodes, Type of files – Ordinary files, Directory files and Device files. The UNIX file system. Creating and handling files, copying, renaming and creating links, absolute and relative pathnames, File permissions and ownership , Comparing files, Compressing and decompressing files, archiving files.

UNIT III

VI Editor: vi basics, Different modex in vi editor, Different working commands in vi editor, handling multiple files, storing multiple text sections, searching and marking text, customizing vi.
AWK Filter: Awk filtering, splitting line into fields, comparison operators, number processing and variables, BEGIN and END section, arrays and functions, Control flow – if, for and while.
Perl Manipulator : perl preliminaries, chop function, variables and operators, string handling, list and arrays, looping, splitting into a list or array and joining lists.

UNIT IV

Shell Programming : Shell scripts, operators, reading and printing, control statement – if, case, while and for. Expression evaluation, command line arguments and shift command, debugging a shell program, exporting shell variables, arrays and string handling, merging streams and shell functions.

UNIT V

Unix System Administration : Administrative privileges, maintaining security, user management, startup and shutdown, managing disk space, device files and handling floppy diskettes, backup and archive programs, partitions and file systems, creating partitions and file systems, mounting and un-mounting file systems, file system checking, system startup and shutdown.

References

1. Sumitabh Das, Unix Concepts and applications, TMH.
2. Stephen Parata, Advance Unix Programming Guide, BPB.
3. Yashwant Kanitkar, Unix Shell Programming, BPB.
4. Mike Joy, Stephen Jarvis, Michael Luck, Introducing Unix and Linux, Palgrave Macmilan.
5. Rachel Morgan, Henry McGilton, Introducing Unix System V, TMH.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 704
DSE01-VISUAL PROGRAMMING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Windows Programming : Windows operating system and MFC, MFC and Windows OS Interaction, The structure of an MFC application, Creating window using MFC, Resource files, Customized icon, cursor and background, Adding menus to window and controlling menu items. Working with timers.

UNIT II

Event Handling: Message Maps, Handling mouse and keyboard events, Handling menu events, Graphics and text drawing, Graphics Device Interface (GDI), Device Context Classes (CDC, CPaintDC & CClientDC), Creating pen and brush, Drawing and bitmap graphics. Adding toolbars and status bar.

UNIT III

Child Windows and Dialog Boxes: Create child windows, popup windows. Using message boxes. Dialog boxes – Modal vs Modeless, Adding dialog boxes to window, Adding controls and handling controls in dialog boxes like Static Text, Edit Box, Command Button Control, Check Box, Radio Button, Lists.

UNIT IV

Document-View Architecture: The Structure of Document-View Architecture, Message Routing, SDI and MDI applications, Message maps in Document-View architecture, Customizing mainframe window and view window, The document template and RUNTIME_CLASS macro.

UNIT V

Splitter Windows and ActiveX Controls: Creating splitter windows, Multiple view classes. What is ActiveX control and adding ActiveX control to project, Using ActiveX control in project, Interacting with control and responding to control ActiveX control events.

References

1. Shirley Wodtke, MFC C++ Classes, BPB Publications.
2. Davis Chapman, Visual C++ Programming, SAMS Publications
3. Kate Gregory, Using Visual C++, Prentice Hall of India Pvt., Ltd.
4. C.H. Pappas, W.H. Murray, Visual C++: The Complete Reference, Tata McGraw-Hill Publishing Company

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 705
DSE02- DATA WAREHOUSING & DATA MINING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining. Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT II

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction.

UNIT III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining

UNIT IV

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Backpropagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods.

UNIT V

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

Applications and Trends in Data Mining: Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining and Social Impacts of Data Mining.

References

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier,2nd Edition, 2006.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.
3. Data Mining Techniques – Arun K Pujari,2nd edition, Universities Press.
4. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson Edn Asia.
5. Insight into Data Mining,K.P.Soman,S.Diwakar,V.Ajay,PHI,2008.
6. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley student Edition

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Faculty of Engineering & Technology
Computer Science & Engineering
ECS 706
DSE03- MOBILE COMPUTING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction, issues in mobile computing, overview of wireless telephony: cellular concept, GSM: air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.

UNIT II

Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.

UNIT III

Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

UNIT IV

Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.

UNIT V

Ad Hoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

References

1. J. Schiller, Mobile Communications, Addison Wesley.
2. A. Mehrotra , GSM System Engineering.
3. M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
4. Charles Perkins, Mobile IP, Addison Wesley.

Charles Perkins, Ad hoc Networks, Addison Wesley

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Faculty of Engineering & Technology

Computer Science & Engineering

ECS 707

DSE04- COLLABORATIVE DEVELOPMENT WITH VERSION CONTROL

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Version Control: History – RCS, CVS, SVN, Git, Mercurials etc., Concepts – Versioning, Repository, Types of Repositories, Repository structure (Trunk, Branch, Tag), Create, Checkout, Commit, Update, Add, Edit, Delete, Rename, Move, Status, Diff, Revert, Log, Tag, Branch, Merge, Resolve, Lock, Command line vs. GUI mode of Operation.

UNIT II

Subversion Basics – SVN AdminCreate, Checkout, Add, Status, Commit, Log, Diff, Update, Commit (with a merge) , Update (with merge) , Move , Rename, Delete, Lock, Revert, Tag, Branch, Merge (no conflicts), Merge (repeated, no conflicts), Merge (conflicts), Access Protocols (file://, http://, svn://, svn+ssh://)

UNIT III

DVCS Concepts – Distinguishing local and remote repository,Clone, Push, Pull, Directed Acyclic Graphs (DAGs), Advantages, Disadvantages. Workflows – managing multiple releases, shrinkwrap software, web software.

UNIT IV

Git Basics – Create, Clone, Add, Status, Commit, Push, Pull, Log, Diff, Update, Commit (with a merge), Update (with merge), Move, Rename, Delete, Revert, Tag, Branch, Merge (no conflicts), Merge (repeated, no conflicts), Merge (conflicts).

UNIT V

Setting up subversion hosting – svnserve, Apache (dav_module, viewvc). Git on the server – Configuration, gitweb, gitolite. Version control in hosted services – Sourceforge, Savannah, GitHub, Bitbucket, Gitorious.

References

1. Eric Sink, “Version Control by Example”, Pyrenean Gold Press, 2011. http://www.ericsink.com/vcbe/index.html Available in digital form for free download.
2. Version control with subversion – http://svnbook.red-bean.com
3. Pro Git – http://git-scm.com/book

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Faculty of Engineering & Technology
Computer Science & Engineering
ECS 708
DSE05- APPLICATION DEVELOPMENT USING PHP

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction, Basics, Data types, Operators, Flow control, Arrays, Array functions, Strings and Regular expressions, Generators

UNIT II

OOP in PHP -- Classes, Objects, Constructors and Destructors, Access Modifiers, Methods, Inheritance, Error and Exceptional Handling , File Handling, PEAR, Security

UNIT III

Common libraries – cURL, GetText, GD, DB access – MySQL, PostgreSQL, SQLite, XML handling using PHP Data Objects (PDO)

UNIT IV

CMS Introduction. Advantages of a CMS, Different types of CMS, Examples , Drupal -- Installation – Content Management, Structure – Site Building – Modules – Theming

UNIT V

Web Development Frameworks – Introduction – Yii – Model View Controller – Entry Script – Application – Controller – Model – View – Component – Module, PHP application development pitfalls.

References

1. Kevin Tatroe, Peter MacIntyre,Rasmus Lerdorf, “Programming PHP”, Creating Dynamic Web Pages, O'Reilly Media, 3rd Edition, 2013

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Computer Science & Engineering
ECS 709
DSE06- PYTHON PROGRAMMING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Python – Installation – Python Interpreter – usage and customization – Editor setup – Variables, Expressions and Statements – Conditionals – Functions.

UNIT II

Strings – Lists – List Comprehensions – Stacks – Queues – Tuples – Sequences – Sets – Dictionaries – Sets.

UNIT III

Modules – Search path – Compiled modules – Standard modules – Packages – Input and Output functions – Files – read and write – Exception – Handling and Raising – User defined Exceptions.

UNIT IV

OOPS in Python – Classes – Scopes and Namespaces – Class Objects – Instance Objects – Method Objects – Inheritance – Iterators – Generators – Generator Expressions.

UNIT V

OS Interface – Command line arguments – String Pattern Matching – Mathematics – Internet Access – Dates and Times – Data Compression – Performance Measurement – Quality Control – Templating – Multi-threading – Logging.

References

1. The Python Tutorial available at http://docs.python.org/3.3/tutorial/
2. How to Think Like a Computer Scientist: Learning with Python (3nd edition) by: Peter Wentworth Jeffrey Elkner, Allen B. Downey, and Chris Meyers. Free Online Version: http://openbookproject.net/thinkcs/python/english3e/
3. Python Documentation available at http://www.python.org/doc/
4. A Byte of Python by Swarooph CH available at http://swaroopch.com/notes/python/

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 751

DSC41 LAB- UNIX LAB

MM : 50 **Sessional : 15**
Time : 2Hr **ESE : 35**
Credits: 02 **Pass Marks : 20**

Perform Following in UNIX

1. Perform different file handling commands.
2. Change file permissions and ownership.
3. Copying and moving files to different folders using relative and absolute path.
4. Using vi editor.
5. Handling files using awk and perl.
6. Create a shell program to reverse a number.
7. Create a shell program to reverse a string.
8. Create a shell program to update a file.
9. Create new user and groups.
10. Display partition information and system information.

NOTE

1. Each experiment shall carry 20 marks and 15 marks shall be reserved for viva-voce examination.
2. In practical examination the student shall be required to perform one experiment.
3. A teacher shall be assigned 20 students for daily practical work in laboratory.
4. No batch for practical class shall consist of more than 20 students.
5. The number of students in a batch allotted to an examiner for practical examination shall not exceed
   20 students.
6. Addition/deletion in above list may be made in accordance with the facilities available with the approval of H.O.D./Dean.

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 752

DSC40 LAB- CRYPTOGRAPHY & NETWORK SECURITY LAB

MM : 50 **Sessional : 15**
Time : 2Hr **ESE : 35**
Credits: 02 **Pass Marks : 20**

Perform Following Experiments in C

1. Write a program to implement Ceaser Cipher.
2. Write a program to implement Mono alphabetic Cipher.
3. Write a program to implement Play Fair Cipher.
4. Write a program to implement Vigenere Cipher.
5. Write a program to implement Hill Cipher.
6. Write a program to implement Rail Fence Cipher.
7. Write a program to implement RSA algorithm.
8. Study of DES algorithm.
9. Study of Fiestel Cipher.
10. Study of diffie Hellman key exchange algorithm**.**

Gurukula Kangri Vishwavidyalaya, Haridwar

Faculty of Engineering & Technology

Computer Science & Engineering

ECS 760

DSC42 LAB- MINOR PROJECT

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
0 0 4

Each student shall be assigned a Minor Project by departmental committee. The student shall be required to perform his project work under the supervision of the supervisor(s). There shall be a seminar on the project work of the student to be evaluated by a departmental committee chaired by H.O.D. The student shall be required to submit his project report in the form of dissertation 15 days before the end of VII semester. The student shall be required to submit three copies of the project work with certificate from the supervisor(s) that the work is authentic record of the work performed by him. The report shall be forwarded by H.O.D. The report of the project work shall be evaluated by the external examiner(s). The same external examiner(s) shall hold the viva-voce examination.

** - Marks for the project work shall be awarded jointly by the external and internal examiners after viva-voce examination.

*** - There shall be a seminar on the project work of the student to be evaluated by the departmental committee chaired by H.O.D.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 801
DSE07- DISTRIBUTED DATABASE MANAGEMENT SYSTEM

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction :Review of relational Databases, Database tuning, Advanced Transaction Processing.

UNIT II

Distributed Databases : Introduction, Architecture, Design, Query Processing,Transaction Management, Concurrency control, Recovery, Parallel databases.

UNIT III

Object Oriented Databases : Introduction, Basic OO concepts, Modeling and design for Object Oriented databases, Persistence, Transaction, Concurrency, Recovery and Versioning.

UNIT IV

Special Purpose Databases : Temporal databases, Active databases, Spatial and multimedia databases, Deductive databases, Mobile databases.

UNIT V

Current Trends : Data warehousing, OLAP, Data mining techniques, Databases and the World Wide Web, Decision support system.

References

1. M. Timer, Ozsu and Patrick Valduriez, Principles of Distributed Database System, Prentice Hall International
2. Setrag Khos Shafian, Object Oriented Databases, John Wiley & Sons Inc., 1993
3. Abdullah Uz Transelet-al (Edited), Temporal Databases – Theory, Design & Implementation, Benjamin / Cummings Publishing Company
4. Jennifer wisdom & Stefano Ceri (Edited), Active Database Systems – Triggers & Rules for Advanced Database Processing, Morgan Kaufmann Publishers Inc.
5. Setrag Khoshafian, A.Brad Baker, Multimedia and Imaging Databases, Morgan Kaufmann

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 802
DSE08- ADVANCE COMPUTER NETWORKS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

OSI model and TCP/IP model, Layered architecture, layer interfaces, Services and protocols, ATM (Design Goals, Problems, Architecture), ATM Connection establishment and release, ATM switching, ATM layers, QoS in ATM.

UNIT II

Routing Techniques, Static Vs Dynamic routing, Static & dynamic routing table, Routing table format, Shortest path routing, distance vector routing, Link state routing, Multicast routing.
Data traffic and properties, Traffic Shaping, Choke Packet, Open and closed loop congestion control, Quality of Service, Techniques to improve QoS, Fragmentation, IPv4 addressing.

UNIT III

Wireless LAN 802.11 Architecture, Physical Layer in 802.11, MAC Sub-layer in 802.11, CSMA/Ca in 802.11, Fragmentation and Frame format, Addressing mechanism, Bluetooth Architecture, Bluetooth Layers.

UNIT IV

IPv4, ICMP, ARP, BGP, CIDR, IPv6 packet format, Transition from IPv4 to IPv6.

UNIT V

Flow control and buffering. Multiplexing. Dialog management. Synchronization. Remote procedure call. Data representation, data compression. Networking security and cryptography.DNS, SNMP, TELNET, FTP, TFTP, NFS, Electronic mail, SMTP, WWW.

References

1. Andrew S. Tanenbaum (3/e), Computer Networks, PHI, 1997
2. Frouzan , Data Communications & Networking(3/e, 4/e)
3. W.Stallings (5/e), Data and Computer Communications, PHI, 1999
4. Douglas E.Comer (3/e), Interworking with TCP/IP,Principles, Protocols & Architecture
5. D. Minoli, Internet & Intranet Engineering, TMH,1999

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 803
DSE09- PARALLEL ALGORITHMS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Sequential model, need of alternative model, parallel computational models such as PRAM, LMCC, Hypercube, Cube Connected Cycle, Butterfly, Perfect Shuffle Computers, Tree model, Pyramid model, Fully Connected model, PRAM-CREW, EREW models, simulation of one model from another one.

UNIT II

Performance Measures of Parallel Algorithms, speed-up and efficiency of PA, Costoptimality, An example of illustrate Cost-optimal algorithms- such as summation,
Min/Max on various models.

UNIT III

Parallel Sorting Networks, Parallel Merging Algorithms on CREW/EREW/MCC/, Parallel Sorting Networks on CREW/EREW/MCC/, linear array

UNIT IV

Parallel Searching Algorithm, Kth element, Kth element in X+Y on PRAM, Parallel Matrix Transportation and Multiplication Algorithm on PRAM, MCC, Vector-Matrix Multiplication, Solution of Linear Equation, Root finding.

UNIT V

Graph Algorithms - Connected Graphs, search and traversal, Combinatorial Algorithms-Permutation, Combinations, Derrangements.

References

1. M.J. Quinn, Designing Efficient Algorithms for Parallel Computer, Mc Graw Hill.
2. S.G. Akl, Design and Analysis of Parallel Algorithms
3. S.G. Akl, Parallel Sorting Algorithm, Academic Press

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Computer Science & Engineering
ECS 804
DSE10- E-COMMERCE

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Electronic Commerce: Frameworks, E-Commerce and Convergence, Anatomy of E-Commerce Applications, Consumer Applications, Organization Applications.

Network Infrastructure for E-Commerce: Market forces influencing, Components of I- Way, Network Access Equipment, Global Information Distribution Network.

Internet as Network Infrastructure: Internet Terminology, History of Internet, NSFNET, National Research and Educational Network, Globalization of Academic Internet, Internet Applications.

UNIT II

E-Commerce and WWW: Architectural Framework of E-Commerce, WWW as the Architecture, Hypertext Publishing, Technology and Security of Web

Consumer Oriented E-Commerce: Consumer Oriented Application, Mercantile Process Model, Mercantile Model from consumer and Merchant's Perspective.

Electronic Payment System: Types of EPS, Digital Token-Based EPS, Smart Cards and EPS, Credit card based EPS, Risk and EPS, Designing EPS.

UNIT III

Inter Organizational Commerce and EDI: EDI, EDI Applications in Business, EDI : Legal, Security and Privacy Issue, EDI and E-Commerce, Standardization and EDI, EDI Software implementation, EDI Envelop for Message Transport, Value Added Networks, Internet Based EDIs.

Intra Organizational E-Commerce: Internal Information System, Macroforces and Internal Commerce, Work-Flow Automation and Coordination, Customization and Internal Commerce.

UNIT IV

Supply Chain Management: SCM Fundamentals, Managing Retail Supply Chain, Supply Chain Application Software, Future of Supply Chain Software

E-Commerce and Banking: Changing Dynamics in Banking industry, Home Banking History and Implementation Approaches, Open Versus Closed Models, Management Issues in Online Banking.

Network Security and Firewalls: Client-Server Network Security, Emerging Client Server Security Threats, Firewalls and Network Security, Data and Message Security, Challenge Response System, Encrypted Documents and E-Mail.

UNIT V

Advertising and Marketing on the Internet: Information based Marketing, Advertising on Internet, Charting on-Line Marketing Process.

Consumer Search and Resource Discovery: Search and Resource Discovery Paradigms, Information Search and retrieval, E-Commerce Catalogs, Information Filtering, Consumer-Data Interface.

Software Agents: History, Characteristics and Properties of Software Agents, Technology behind Software Agents, Telescript Agent Language, Safe-Tcl, Applets, Browser and Software Agents.

References

1. Ravi Kalokaota and A.B. Whinston, Frontiers of Electronic Commerce , Addison-Wesley
2. Ravi Kalokaota and A.B. Whinston, Electronic Commerce A Manager's Guide, Addison-Wesley

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Computer Science & Engineering
ECS 805
DSE11- DIGITAL IMAGE PROCESSING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction and Fundamentals: Motivation and Perspective, Applications, Components of Image Processing System, Element of Visual Perception, A Simple Image Model, Sampling and Quantization.

Image Enhancement in Spatial Domain : Introduction; Basic Gray Level Functions – Piecewise-Linear Transformation Functions: Contrast Stretching; Histogram Specification; Histogram Equalization; Local Enhancement; Enhancement using Arithmetic/Logic Operations – Image Subtraction, Image Averaging; Basics of Spatial Filtering; Smoothing - Mean filter, Ordered Statistic Filter; Sharpening – The Laplacian.

UNIT II

Image Enhancement in Frequency Domain : Fourier Transform and the Frequency Domain, Basis of Filtering in Frequency Domain, Filters – Low-pass, High-pass; Correspondence Between Filtering in Spatial and Frequency Domain; Smoothing Frequency Domain Filters – Gaussian Lowpass Filters; Sharpening Frequency Domain Filters – Gaussian Highpass Filters; Homomorphic Filtering.

Image Restoration : A Model of Restoration Process, Noise Models, Restoration in the presence of Noise only-Spatial Filtering – Mean Filters: Arithmetic Mean filter, Geometric Mean Filter, Order Statistic Filters – Median Filter, Max and Min filters; Periodic Noise Reduction by Frequency Domain Filtering – Bandpass Filters; Minimum Mean-square Error Restoration.

UNIT III

Color Image Processing : Color Fundamentals, Color Models, Converting Colors to different models, Color Transformation, Smoothing and Sharpening, Color Segmentation.

Morphological Image Processing : Introduction, Logic Operations involving Binary Images, Dilation and Erosion, Opening and Closing, Morphological Algorithms – Boundary Extraction, Region Filling, Extraction of Connected Components, Convex Hull, Thinning, Thickening

UNIT IV

Registration : Introduction, Geometric Transformation – Plane to Plane transformation, Mapping, Stereo Imaging – Algorithms to Establish Correspondence, Algorithms to Recover Depth

Segmentation : Introduction, Region Extraction, Pixel-Based Approach, Multi-level Thresholding, Local Thresholding, Region-based Approach, Edge and Line Detection: Edge Detection, Edge

Operators, Pattern Fitting Approach, Edge Linking and Edge Following, Edge Elements Extraction by Thresholding, Edge Detector Performance, Line Detection, Corner Detection.

UNIT V

Feature Extraction : Representation, Topological Attributes, Geometric Attributes
Description : Boundary-based Description, Region-based Description, Relationship.
Object Recognition : Deterministic Methods, Clustering, Statistical Classification, Syntactic Recognition, Tree Search, Graph Matching

References

1. Rafael C. Gonzalvez and Richard E. Woods, Digital Image Processing 2nd Edition, Pearson Education.
2. R.J. Schalkoff, Digital Image Processing and Computer Vision, John Wiley and Sons, NY.
3. A.K. Jain, Fundamentals of Digital Image Processing,Prentice Hall, Upper Saddle River, NJ.

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Faculty of Engineering & Technology

Computer Science & Engineering

ECS 806

DSE12- INDUSTRIAL ECONOMICS AND BUSINESS ADMINISTRATION

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Industrial Economics: Elasticity of demand and supply, Demand forecasting methods, Consumption laws, Types of competition, Break even analysis, National income accounting, Trends in Industrialization in India, Economies of scale, Production Planning and control.

UNIT II

Money, Banking and Financial Management: Nature and functions of money, Functions of commercial and central banks, Credit creation in the banks, Balance of payment and trade, Foreign Exchange, Exchange control, Devaluation and Revaluation, Sources of Industrial Finance, Principles of accounting, Balance sheet & P & L A/C, Cash flow statement.

UNIT III

Principles of Management: Managerial functions - Planning, Organizing Leading & Controlling.

UNIT IV

Marketing Management: Concept of marketing management, P's of marketing, Product life cycle, Market segmentation.

UNIT V

Personnel Management and Industrial Psychology: Concept and importance of Personnel Management recruitment and selection, Training and development, Job evaluation, Fatigue, Accidents - causes and prevention, Nature of Industrial relations, Industrial disputes, Quality of work life.

References

1. Dewtt. K.K., Modern Economic Theory" S. Chand, & Co (r) Ltd (r) 1999.
2. Robbins (r) P. Stephen, Coutter Mary, 'Management' PHI 1998.
3. Kotler Philip, 'Marketing Management', PHI latest edition.
4. Nair N.G.,Latha Nair,Personnel Management and Industrial Relations', S.Chand &Co 1999.
5. Singh S.P. "Industrial Economics & Management" AITBS, New Delhi, 2006
6. Kooutsnnis, 'Modern Economic Theory', PHI, 1996.
7. Maheswari S.N., 'An Introduction to Accountancy' Vikas Publishing House 1999.
8. Koontz Harold, O Donnel Cyril, Weihirch Heniz, 'Management', TMH-1983.
9. Monoppan Arun, Sayadain S (r) Mirza, 'Personnel Management', TMH 1997 Edn.

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ECS 807
DSE13- NATURAL LANGUAGE PROCESSING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Natural Language Understanding: The study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, Linguistic Background: An outline of English syntax.

UNIT II

Introduction to semantics and knowledge representation, Some applications like machine translation, database interface.

UNIT III

Grammars and Parsing: Grammars and sentence Structure, Top-Down and Bottom-Up Parsers, Transition Network Grammars, Top-Down Chart Parsing. Feature Systems and Augmented Grammars: Basic Feature system for English, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks.

UNIT IV

Grammars for Natural Language: Auxiliary Verbs and Verb Phrases, Movement Phenomenon in Language, Handling questions in Context-Free Grammars. Human preferences in Parsing, Encoding uncertainty, Deterministic Parser.

UNIT V

Ambiguity Resolution: Statistical Methods, Probabilistic Language Processing, Estimating Probabilities, Part-of-Speech tagging, Obtaining Lexical Probabilities, Probabilistic Context-Free Grammars, Best First Parsing. Semantics and Logical Form, Word senses and Ambiguity, Encoding Ambiguity in Logical Form.

References

1. Akshar Bharti, Vineet Chaitanya and Rajeev Sangal, NLP: A Paninian Perspective, Prentice Hall, New Delhi
2. James Allen, Natural Language Understanding,2/e, Pearson Education
3. D. Jurafsky, J. H. Martin, Speech and Language Processing, Pearson Education
4. L.M. Ivansca, S. C. Shapiro, Natural Language Processing and Language Representation
5. T. Winograd, Language as a Cognitive Process, Addison-Wesley

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 808
DSE14- REAL TIME SYSTEMS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction : Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency.

UNIT II

Real Time Scheduling : Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST) Algorithms, Offline Versus Online Scheduling, Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems.

UNIT III

Resources Access Control : Effect of Resource Contention and Resource Access Control (RAC), Nonpreemptive Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects.

UNIT IV

Multiprocessor System Environment : Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling Protocol, Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, Scheduling of Tasks with Temporal Distance Constraints.

UNIT V

Real Time Communication : Model of Real Time Communication, Priority-Based Service and Weighted Round-Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time Protocols, Communication in Multicomputer System, An Overview of Real Time Operating Systems.

References

1. Jane W. S. Liu, Real Time Systems, Pearson Education Publication.
2. Prof. Albert M. K. Cheng, Real-Time Systems: Scheduling, Analysis, and Verification, John Wiley and Sons Publications.

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Faculty of Engineering & Technology

Computer Science & Engineering

ECS 809

DSE15- EMBEDDED SYSTEMS

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to embedded systems: Classification, Characteristics and requirements

UNIT II

Timing and clocks in Embedded systems, Task Modeling and management, Real time operating system issues.

UNIT III

Signals, frequency spectrum and sampling, digitization (ADC, DAC), Signal Conditioning and Processing. Modeling and Characterization of Embedded Computation System.

UNIT IV

Embedded Control and Control Hierarchy, Communication strategies for embedded systems: Encoding and Flow control.

UNIT V

Fault-Tolerance Formal Verification.

References

1. H.Kopetz, Real-Time Systems, Kluwer
2. R.Gupta, Co-synthesis of Hardware and Software for Embedded Systems, Kluwer

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Faculty of Engineering & Technology
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ECS 810
DSE16- ADVANCE COMPUTER ARCHITECTURE

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Pipelining: principles of linear pipelining; instruction pipelines- speedup, data dependency hazards, remedy measures, branch handling; Arithmetic pipelines; pipeline control- job sequencing and collision prevention, pipeline chaining; case studies of pipelined systems.

UNIT II

Vector Processing: Characteristics and requirements; pipelined vector processing; vectorization methods; vector processing in some systems Array Processing: SIMD array processors; communications; SIMD interconnection networks some algorithms for array processing.

UNIT III

Parallel Processing: Introduction, data and control parallelism, concurrency, scalability, speedup, Amdahl's law, PRAM model of parallel computation, parallel algorithms multiprocessors and multicomputers: Processor organizations- mesh, binary tree, hypercube etc.

UNIT IV

Shared Memory and Message Passing Systems: loosely and tightly coupled systems. Mapping and scheduling: Embedding of tasks graphs in processor graphs, dilation and loading; load balancing on multicomputers; deterministic and nondeterministic models for static scheduling

UNIT V

Dynamic Scheduling: prevention of deadlocks. Parallel programming languages: creation and programming of parallel processes; synchronization among processes; languages offering features for data parallelism such as C, FORTRAN 90; general MIMD programming languages.

References

1. Hwang K., Advanced Computer Architecture, McGraw Hill
2. Dasgupta, Subrata, Computer Architecture, A modern synthesis, John wiley
3. Stone, H.S., Introduction to Computer Architecture, McGraw Hill
4. Hwang K., Briggs, F.A., Computer Architecture and Parallel Processing, McGraw Hill

Gurukula Kangri Vishwavidyalaya, Haridwar
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Computer Science & Engineering
ECS 811
DSE17- MOBILE APPLICATION DEVELOPMENT

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction: Mobile operating system, Operating system structure, Constraints and Restrictions, Hardware configuration with mobile operating system, Features: Multitasking Scheduling, Memory Allocation, File System Interface, Keypad Interface, I/O Interface, Protection and Security, Multimedia features.

UNIT II

Introduction to Mobile development IDE's , Introduction to Worklight basics, Optimization, pages and fragments , Writing a basic program- in Worklight Studio, Client technologies, Client side debugging, Creating adapters, Invoking adapters from Worklight Client application, Common Controls, Using Java in adapters, Programming exercise with Skins, Understanding Apache Cordova, Offline access, Encrypted cache deprecated, Using JSONStore

UNIT III

Understanding Apple iOS development, Android development, Shell Development, Creating Java ME application, Exploring the Worklight Server, Working with UI frameworks, Authentication, Push notification, SMS Notifications, Globalization, WebView overlay , Creating Authentication application: development for Apple iOS by using a login module, Device Analytics, Worklight Server Administration

Unit IV

Windows Phone: Introduction to Windows Phone, Architecture, memory management, communication protocols, application development methods, deployment.
Case Study: Design and development of Application using mobile application development platforms e.g. WorkLight, Kendo, Appcon, Xcode, Xpages

Unit V

Android: Introduction to Android, Architecture, memory management, communication protocols, application development methods, deployment.
Case Study: Design and development of Application using mobile application development platforms e.g. WorkLight, Kendo, Appcon, Xcode, Xpages

iOS: Introduction to iOS, Architecture, memory management, communication protocols, application

development methods, deployment.
Case Study: Design and development of Application using mobile application development platforms e.g. WorkLight, Kendo, Appcon, Xcode, Xpages

Text Books -:

1. IBM -Worklight resources
2. PhoneGap Essentials: Building Cross-Platform Mobile Apps -- By John M. Wargo
3. Pro iOS Geo: Building Apps with Location Based Services -- By Giacomo Andreucci
4. Mobile Device Management: - by Michael Johnson
5. Mobile Device Security – by Stephen Fried..
6. Jeff McWherter, Scott Gowell "Professional Mobile Application Development", John Wiley & Sons, 2012.
7. Jennifer Kyrnin, "Sams Teach Yourself HTML5 Mobile Application Development in 24 Hours", Sams Publishing, 2011.
8. Damon Oehlman, Sébastien Blanc, "Pro Android Web Apps: Develop for Android using HTML5, CSS3 & JavaScript", Apress, 2011.
9. Burd, "Android Application Development All-in-One For Dummies", John Wiley & Sons, 2011.
10. Henry Lee, Eugene Chuvyrov, "Beginning Windows Phone App Development", Apress, 2012.
11. Neal Goldstein, Tony Bove, "iPhone Application Development All-In-One For Dummies", John Wiley & Sons, 201

Additional Learning Resources

1. http://www-01.ibm.com/software/mobile-solutions/worklight/
2. https://www.ibm.com/developerworks/mobile/worklight/getting-started/
3. http://pic.dhe.ibm.com/infocenter/wrklight/v5r0m5/index.jsp

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ECS 812
DSE18- BIG DATA

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Big Data Overview: Introduction to Big Data. History of Big Data.What is big data? (Reference : Understanding Big Data)

UNIT II

Analysis of data at Rest- Hadoop analytics: Limitations of existing distributing systems: Hadoop Approach, Hadoop Architecture: Distributed file system: HDFS and GPFS, Lab: Shell commands, File I/O APIs, MapReduce programming paradigm in general, Internals of Hadoop MR engine, Need for High level language: JAQL and PIG.

UNIT III

Introduction to Text Analytics: Using Regular expressions, Using AQL, Sentiment analysis. No SQL: JSON store, MongoDB, RDF, HBASE. Analytics: Clustering, Classification, Segmentation, Linear regression, ML. Search: What is Indexing and Indexing Techniques, Create inverted index using JAQL, Lab using Data Explorer. Bundling Hadoop job: What is Application?, Use BI tooling to create application, Publish applications.

UNIT IV

Analysis of data in motion – Real time analytics: Introduction to streams computing, Challenges/limitations of conventional Systems, Solving a real time analytics problem using conventional system, Challenges to be solved - scalability, thread pooling, etc.

UNIT V

Understanding the challenges in handling streaming data from the real world, how to address those using stream computing, Benefits of stream computing in Big Data world, Realtime Analytics Platform(RTAP) and putting RTAP to use(with lab work)

References

1. **IBM Material**

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ECS 813
DSE19- COMPUTER VISION

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction Computer Vision, What is Computer Vision, Image Formation Models, Monocular imaging system, Orthographic & Perspective Projection, Camera model and Camera calibration • Binocular imaging systems.

UNIT II

Image Processing and Feature Extraction , Image representations (continuous and discrete), Edge detection.

UNIT III

Motion Estimation, Regularization theory, Optical computation, Stereo Vision, Motion estimation, Structure from motion

UNIT IV

Shape Representation and Segmentation, Deformable curves and surfaces, Snakes and active contours, Level set representations, Fourier and wavelet descriptors, Medial representations, Multiresolution analysis

UNIT V

Object recognition, Hough transforms and other simple object recognition methods, Shape correspondence and shape matching, Principal component analysis, Shape priors for recognition

References

2. Computer Vision - A modern approach , by D. Forsyth and J. Ponce, Prentice Hall
3. Robot Vision , by B. K. P. Horn, McGraw-Hill.
4. Computer Vision Relevant Courses CAP 5416
5. Computer Vision References Introductory Techniques for 3D Computer Vision , by E. Trucco and A. Verri, Publisher: Prentice Hall.

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 814
DSE20- RELATIONAL DATABASE MANAGEMENT SYSTEM

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

What is DBMS ?, History of DBMS – Navigational, Relational, Object Oriented, XML and NoSQL Databases, Database Models – Hierarchical, Network, Relational, Multidimensional and Object Oriented models, Relational Database System Architecture, RDBMS – Postgresql and Sqlite

UNIT II

Relational Database Design – ER models, ER diagrams and Database normalization, Locks, Concurrency-Control-MVCC, ANSI-SQL Overview, Data Definition, Basic structures, Basic Operations.

UNIT III

ANSI-SQL Data Modification Statements, Null values, Aggregate Functions, Nested Sub-queries, SQL Joins – Inner and Outer Joins, Views – creation and updating, Transactions, Integrity Constraints – not null, unique, check and referential integrity, Functions and Procedures, Triggers

UNIT IV

Server Setup, Server Configuration, Managing Databases, Backup and Restore, Database Monitoring, High Availability, Load, Balancing, Replication and concepts of Clustering.

UNIT V

Embedded SQL – Cursors and Dynamic SQL using PgSQL, Embedded SQL in C using ECPG, JDBC access to Postgresql, Embedded Database in C – Using the Sqlite C/C++ API

References

1. Database System Concepts, Sixth Edition, 2011 – Abraham Silberschatz, Henry F. Korth, S. Sudarshan – McGrawHill
2. PostgreSQL 9 Administration Cookbook ; By Simon Riggs, Hannu Krosing ; ISBN: 9789350232866 ; Shroff/Packt (2011)
3. Postgresql Manuals – http://www.postgresql.org/docs/
4. SQLite Documents – http://www.sqlite.org/docs.html
5. Planet PostgreSQL - http://planet.postgresql.org/

Gurukula Kangri Vishwavidyalaya, Haridwar
Faculty of Engineering & Technology
Computer Science & Engineering
ECS 815
DSE21- STORAGE MANAGEMENT

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

UNIT II

Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modulararrays, Component architecture of intelligent disk subsystems, Disk physical structure components,properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

UNIT III

Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparision. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

UNIT IV

Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

UNIT V

Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

References

1. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
2. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Managementand Security, CRC Press, Taylor Frances Pub.
3. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
4. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach,TMH Pub.
5. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
6. Sosinsky, Cloud Computing Bible, Wiley India.
7. Rich Schiesser, IT Systems Management :Designing, Implementing and Managing World-classInfrastructures, PHI Learning

Suggested Tools : Tivoli Storage Manager

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Computer Science & Engineering
ECS 816
DSE22- OPEN SOURCE SOFTWARE

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement,Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential— globaland Indian**.**

UNIT II

GNU/Linux OS installation--detect hardware, configure disk partitions & file systems andinstall a GNU/Linux distribution ; Basic shell commands -logging in, listing files, editing files,copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAMauthentication ; Introduction to common system configuration files & log files ; Configuringnetworking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup,DSL, Ethernet, leased line) ; Configuring additional hardware -sound cards, displays & displaycards, network cards, modems, USB drives, CD writers ; Understanding the OS boot upprocess ; Performing every day tasks using gnu/Linux --accessing the Internet, playing music,editing documents and spreadsheets, sending and receiving email, copy files from disks and overthe network, playing games, writing CDs ; X Window system configuration and utilities-- configureX windows, detect display devices ; Installing software from source code as well as using binarypackages

UNIT III

Setting up email servers--using postfix (SMTP services), courier (IMAP & POP3 services),squirrel mail (web mail services) ; Setting up web servers --using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services --using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux /Unix networks) ; Setting up proxy services --using squid (http / ftp / https proxy services) ;Setting up printer services -using CUPS (print spooler), foomatic (printer database) ; Setting up afirewall -Using netfilter and iptables

UNIT IV

Using the GNU Compiler Collection --GNU compiler tools ; the C preprocessor (cpp), the Ccompiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems--constructing make files and using make, using autoconf and autogen to automaticallygenerate make files tailored for different development environments ; Using source codeversioning and management tools --using cvs to manage source code revisions, patch & diff ;Understanding the GNU Libc libraries and linker -linking against object archives (.a libraries) anddynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating

dynamically linked libraries ; Using the GNU debugging tools --gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ;

Review of common programming practicies and guidelines forGNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting.

UNIT V

Basics of the X Windows server architecture, Qt Programming, Gtk+ Programming, Python Programming, Programming GUI applications with localisation support.

References

1. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B SPublishers; 2005.
2. Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002.
3. Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, 2004.

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Faculty of Engineering & Technology

Computer Science & Engineering

ECS 817

DSE23- INFORMATION SECURITY

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Security Engineering – Framework, Applications. Application Usability – Passwords (attacks and countermeasures), System Issues. Basic Cryptography -- History, Random Model, Symmetric Cryptography, Modes of Operation, Hash Functions, Asymmetric Cryptography-PKI.

UNIT II

Eavesdropping, Simple Authentication, Authorization, Encryption Management, Formal Verification, OS access control, Hardware Protection, Access Control Failures.

UNIT III

Introduction to the application vulnerability & Mitigations -- Injection , Broken Authentication and Session Management, Cross-Site Scripting (XSS), Insecure Direct Object References , Security Misconfiguration, Sensitive Data Exposure, Missing Function Level Access Control, Cross-Site Request Forgery (CSRF), Using Known Vulnerable Components, Unvalidated Redirects and Forwards, Debugging Tools – burpsuite, Tamper Data, Apache Jmeter.

UNIT IV

Multilevel Security Policy Models, Real Life Examples – SELinux, AppArmor, Virtualization. Problems. Multilateral Security – Models – Lattice, Chinese Wall, BMA. Inference Control.

UNIT V

Security Management – Risk Management, Organisational issues, Methodologies, Security Risk Engineering. System Assurance. Evaluation – Common Criteria (ISO/IEC15408), hostile review, FOSS, CERTS, Bugtraq, Education, Security audit.

References

1. Case Study of App Scan, XRadar
2. Ross Anderson, “Security Engineering”, Wiley, 2nd Edition, 2008.
3. “The Open Web Application Security Project Development Guide”, https://www.owasp.org/index.php/Category:OWASP_Guide_Project (for Unit III)
4. Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, “Handbook of Applied Cryptography”, http://cacr.uwaterloo.ca/hac/, Digital copy available for download.
5. Matt Bishop, “Computer Security: Art and Science”, Addison-Wesley Professional, 200.
6. “Vulnerability Scanner and Web application Penetration testing”, Metasploit (Community Version), http://www.metasploit.com.
7. Tony Howlett, “Open Source Security Tools- Practical Applications for Security”, Prentice Hall, 2004

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Faculty of Engineering & Technology
Computer Science & Engineering
ECS 818
DSE24- SOFT COMPUTING

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Introduction to Neural Networks, Artificial Neuron and its model, activation functions, Neural network architecture: single layer and multilayer feed forward networks, Neural learning, Supervised Learning: Single layer networks, Multilayer networks.

Back propagation algorithm, Prediction Networks, Unsupervised Learning, Associated Learning, Optimization using Hopfield Networks, application of neural algorithm

UNIT II

FUZZY SETS AND OPERATIONS: Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Different faces of imprecision -inexactness, Ambiguity, Fuzziness and uncertainty, Conventional set operations, Intersections of Fuzzy sets, Union of Fuzzy sets, the complement of Fuzzy sets, Probability & Fuzzy logic, Fuzzy control and knowledge based systems.

UNIT III

FUZZY REASONING: Linguistic variables, Fuzzy propositions, Fuzzy compositional rules of inference, the Min-Max rules, fuzzy additive rules of implication, Methods of decompositions and defuzzification-composite maximum, average of maximum values and centre of maximums.

UNIT IV

METHODOLOGY OF FUZZY DESIGN: Direct & Indirect methods with single and multiple experts, Construction from sample data- Least square method, Adaptive Fuzzy controllers-Membership function tuning using gradient descent

UNIT V

INTRODUCTION TO GENETIC ALGORITHMS: procedures of GA, flow chart of GA, robustness of traditional optimization and search Methods, difference of Genetic Algorithm from Traditional Methods, simulation of a simple genetic algorithm,Genetic operators, Mutation, Crossover, data structures and concepts in computer implementation of a genetic algorithm, application of genetic algorithms

References:

1 Elements of Artificial Neural network, Kishan Mehrotra,Chilukuri K.Mohan, S.Ranka (Penram Int.)
2 Introduction to Artificial Neural Systems J.M.Zurada (JAICO)
3 Zimmermann, H.J. 'Fuzzy set theory and its applications', Allied publishers limited, Madras,1966
4 Klir, G.l., and Folger, T. 'Fuzzy sets, uncertainty and information', PHI, New Delhi,1991.
5 EarlCox,'The Fuzzy Systems Harldbook', AP professional Cambridge, MA 02139, 1994 6
6. David E. Goldberg, Genetic Algorithms, Pearson Education india
7. S. N. Sivanandam & S. N. Deepa, Introduction to Genetic Algorithms, Springer

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Computer Science & Engineering
ECS 819
DSE25- BUSINESS INTELLIGENCE

MM : 100 **Sessional : 30**
Time : 3 hrs **ESE : 70**
L T P **Credits 4**
3 1 0

NOTE: The question paper shall consist of three sections (Sec.-A, Sec.-B and Sec.-C). Sec.-A shall contain 10 objective type questions of one mark each and student shall be required to attempt all questions. Sec.-B shall contain 10 short answer type questions of four marks each and student shall be required to attempt any five questions. Sec.-C shall contain 8 descriptive type questions of ten marks each and student shall be required to attempt any four questions. Questions shall be uniformly distributed from the entire syllbus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

UNIT I

Turning data into information- Business and data, Challenges for Business and data, Data, Information, Insight, Data decision challenge, Operational versus Informational data,
Data Warehouse architecture, What is a Data Warehouse, Logical tiers in a Data Warehouse, concept of Data Mart, Data Warehouse process flow, Dynamic Warehousing, Decision Support System , Decision support processes, Decision support users ,DW + DSS = Business Intelligence areas, Information as a service, Explicit and tacit knowledge, Knowledge lifecycle, Value of information, Extending beyond the Data Warehouse

Building the data warehouse - Data Modeling and Metadata, Data Warehouse modeling and design, The challenges, Requirements capturing, Modeling, Modeling process, Modeling techniques - Entity relationship modelling, Temporal modeling, Multidimensional modelling, Snowflake — Dimension hierarchies, Multidimensional data modeling – Basic, ERM versus MDDM, Metadata, Types of metadata, Metadata benefits, Populating the Data Warehouse, Data transformation, Anomalies in data fields, Lack of data standards, Lack of data consolidation, Federation.

UNIT II

Accessing the data warehouse- Data warehouse usage, Decision support processing, Decision support system users, Query and reporting, Query and reporting process flow,
Data analysis, Data analysis,OLAP, OLAP: Multdimensional view, OLAP: Slice and dice, Data mining, Information mining / Data mining, Statistical Analysis versus Data Mining, Data mining process , data mining algorithms , BI technologies

Information integration – Components, Functions, Information integration, Data workflow, Information as a service, SOA, SOA reference architecture, Data warehouse and MDM, MDM logical architecture, MDM logical architecture with Data warehousing, MDM with Data warehousing and information integration, MDM, data warehouse and EII, Operational Data store / dynamic warehousing, Batch processing, Data warehouse and MDM working together

UNIT III

Wrap up and Planning considerations- Planning Considerations, Data insight, The big picture, Suggestions for success, People stand in the middle of the environment

UNIT IV

Understanding information on demand, COGNOS BI and fpm

COGNOS BI components, ibm COGNOS BI architecture (high level), COGNOS BI groups and roles, Introduction to the reporting application, Report studio , explore the environment ,report templates, properties of an object , dimensionally-modeled and multi-dimensional data sources, examine list reports Group data ,fact/measure data, aggregate data, difference in aggregation, shared dimensions to create multi-fact queries, Focus reports using filters, Filters, advanced detail filters,

filter with aggregation , Pre-defined source filters , crosstab report, measures to crosstab reports, unrelated items in crosstab edges , Present data graphically, Chart report, create charts containing peer and nested items, custom chart palettes, gauge charts, parameters and prompts

UNIT V

Extend reports using calculations & maps, Deriving information from the data source , run-time features from reports , present data using maps, map reports:match your data source, zoom capabilities, Statistics -statistical report types, descriptive statistics, normality and related terms, Working with multiple reports, drill – through from one report to another, set up drill-through access from a report, values passed to target parameters, navigate through multiple reports, Package-based drill through, drill through from Measure-based scope , drill through assistant, Enhance report layout, Structure of the report , page breaks in reports, horizontal pagination, modifying structures, Change pdf page orientation to suit report objects, Set pdf security options, Format objects across a report.

References:

1. IBM -Changing Business with Data Insight
2. IBM - Working with Cognos Report Builder
3. Business Intelligence by David Loshin
4. Business intelligence for the enterprise by Mike Biere
5. Business intelligence roadmap by Larissa Terpeluk Moss, Shaku Atre

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Faculty of Engineering & Technology

Computer Science & Engineering

ECS 860

DSC43- MAJOR PROJECT

MM : 400 **Sessional : 100**
Time : 8Hr **ESE : 300**
Credits: 08

Each student shall be assigned a Major Project by departmental committee. The student shall be required to perform his project work under the supervision of the supervisor(s). There shall be a seminar on the project work of the student to be evaluated by a departmental committee chaired by H.O.D. The student shall be required to submit his project report in the form of dissertation 15 days before the end of VIII semester. The student shall be required to submit three copies of the project work with certificate from the supervisor(s) that the work is authentic record of the work performed by him. The report shall be forwarded by H.O.D. The report of the project work shall be evaluated by the external examiner(s). The same external examiner(s) shall hold the viva-voce examination.

** - Marks for the project work shall be awarded jointly by the external and internal examiners after viva-voce examination.

*** - There shall be a seminar on the project work of the student to be evaluated by the Departmental committee chaired by H.O.D.