Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
Department of Electronics & Communication Engineering
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. IInd YEAR (SEMESTER –IV)
Choice Based Credit Scheme w.e.f. 2019-20

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam	Contact Hrs./wk.
			L	T	P		Theory	Practical				
1	ECE202C	Communication System	3	0	-	25	75	-	100	3	3	4
2	ECE282C	Communication System lab	0	0	2	25	-	75	100	1	3	2
3	ECE204C	Analog Circuits	3	0	-	25	75	-	100	3	3	4
4	ECE284C	Analog Circuits lab	0	0	2	25	-	75	100	1	3	2
5	ECE206C	Microprocessor & Interfacing	3	0	-	25	75	-	100	3	3	3
6	ECE286C	Microprocessor & Interfacing lab	0	0	2	25	-	75	100	1	3	2
7		(Slot for BS/ES/HS courses)*								8		
8	MC201C or MC203C	Environmental Studies (Gr.-A) or Constitution of India (Gr.-B)	3	0	0	25	75	-	100	-	3	3
		Total	**15**	**0**	**10**	**250**	**375**	**375**	**1000**	**20**		

Note:

1. (*) Select any two subjects (along with respective lab) from table given below:-

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam	Contact Hrs./wk.
			L	T	P		Theory	Practical				
1	CSE214C	Object Oriented Programming	3	0	0	25	75	-	100	3	3	3
2	CSE284C	Object Oriented Programming Lab	0	0	2	25	-	75	100	1	3	2
3	MATH211C	Numerical Methods	3	0	0	25	75	-	100	3	3	3
4	MATH213C	Numerical Methods lab	0	0	2	25	-	75	100	1	3	2
5	CSE303C	Data Base Management System	3	0	0	25	75	-	100	3	3	3
6	CSE383C	Data Base Management System Lab	0	0	2	25	-	75	100	1	3	2

2. At the end of 4th semester each student has to undergo Professional Training (level-2) of atleast four weeks from industry, institute, research lab,training centre during summer vacation and its evaluations shall be carried out in the 5th semester.

3. Environmental Studies (MC201C)/ Constitution of India (MC203C) are mandatory & qualifying courses.

4. For DCRUST Murthal: GROUP A: BME, BT, CSE, ECE.   GROUP B: CE, CHE, EE, ME.

5. For student admitted in B. Tech. 1st Semester (C-Scheme) in 2019 and all trailing students, Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

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A Unit of Puran Murti Educational Society
Approved by AICTE ,Recognized Under Section 2 (f) by UGC
Affiliated to Deenbandhu Chhotu Ram University of Science
And Technology, Murthal, Sonipat

Subject: Communication Systems   **Subject Code: ECE202C**

B.Tech. 2ⁿᵈ YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits		
3	0	0	3		

Class Work	: 25
Examination	: 75
Total	: 100
Duration of Exam	: 3 Hours

Unit 1

Topic no 1 Introduction to Communication System:Modulation,
Topic no 2 Demodulation, Radio Frequency Spectrum, Signals & their classification,
Topic no 3 Limitations & Advantages of a Communication System
Topic no 4 Comparison of Analog & Digital Communication Systems,
Topic no 5 Historical Perspective, Modes & Medias of Communication.
Topic no 6 Noise: Sources of Noise, External & Internal Noise, Noise Calculations,
Topic no7 Noise Figure, Noise Figure Calculation, Noise Temperature,
Topic no 8 Noise in Communication Systems, Band Pass Noise Model,
Topic no 9 Cascaded States & its Noise Figure Calculation, Signal in presence of Noise,
Topic no 10 Pre-Emphasis & De-Emphasis, Noise Quieting Effect,
Topic no 11 Capture Effect, Noise in Modulation Systems.

Unit 2

Topic no 12 Modulation:(AM) Basic definition & derivation for Modulation
Topic no13 Modulation Index, Modulation & Demodulation of AM,
Topic no 14 Suppressed Carrier Modulation, Quadrature Amplitude Modulation,
Topic no 15 SSB-SC, DSB-SC, VSB Modulation & Demodulation,
Topic no 16 Comparison of various AM Systems, Generation of AM waves.
Topic no 17 Angle Modulation:
Topic no 18 Basic definition & derivation for Modulation & Modulation Index,
Topic no 19 Generation of FM waves, Comparison between PM & FM,
Topic no 20 Frequency Spectrum of FM, B.W. & required spectra,
Topic no 21 Types of FM, vector representation of FM, Universal Curve,
Topic no 22 Multiple FM, Demodulation of FM waves, Demodulation of PM waves,
Topic no 23 Comparison between AM & FM.

Unit 3

Topic no 24 Transmitters & Receivers: Classification of Radio Transmitters,
Topic no25 Basic Block Diagram of Radio Transmitter,
Topic no 26 Effect of Feedback on operation of Transmitter,
Topic no 27 Radio Telephone Transmitters, Privacy Device in Radio Telephony,
Topic no 28 FM Transmitter using Reactance Modulator, Armstrong FM Transmitter,
Topic no 29 Radio Receivers, Classification, TRF Receiver, Super Heterodyne Receiver,
Topic no 30 Image Rejection & Double Spotting, Choice of IF,
Topic no 31Tracking & Alignment of Receivers, AGC.
Topic no 32 Pulse Analog Modulation: Sampling theory, TDM, FDM, PAM,
Topic no 33 PWM, PPM, Modulation & Demodulation techniques of above all.

Unit 4

Topic no 34 Pulse Digital Modulation:Elements of Pulse Code Modulation,
Topic no35 Noise in PCM Systems, Bandwidth of PCM Systems,
Topic no36 Measure of Information, Channel Capacity,
Topic no 37Channel Capacity of PCM System,

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Topic no 38 Differential Pulse Code Modulation (DPCM). Delta Modulation (DM)
Topic no 39 Digital Carrier Modulation And Demodulation Techniques:

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Topic no 40 Digital Modulation Formats, Coherent Binary Modulation & Demodulation:

Topic no 41 ASK, BPSK, BFSK, Coherent Quadrature Modulation

Topic no 42 Demodulation Techniques: QPSK, MSK.

Topic no 43 Non Coherent BFSK, Differential PSK, M-Ary Modulation

Topic no 44 Demodulation Techniques: M-Ary PSK, M-Ary QAM,

Topic no 45 M-Ary FSK, Synchronization: Carrier & Symbol Synchronization.

Reference Books:

1. Communication Systems   By Manoj Duhan – I. K. International
2. Electronic Communication Systems   By Kennedy – TMH
3. Communication Systems   By Singh & Sapre – TMH
4. Communication System Engineering   By John G. Proakis and Masoud Salehi, Pearson Education, 2015.
5. Analog Communication   By P. Chakarbarti – DR & Co.
6. Communication Systems   By Simon Haykins – Wiley

Course Outcomes: At the end of the course, students will be able to:

1. Familiarize with basic concepts like AM, FM, PM and digital modulation.
2. Differentiate between the working of transmitter and receiver of various analog and digitalmodulation techniques.
3. Design and rectify various communication gadgets and remove/reduce effects of noise on theirworking.
4. Suggest up gradation in the existing communication systems with lesser radiation output andbetter signal quality for the betterment of human kind.

Note:

1. In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

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Subject: Communication Systems Lab   **Subject Code: ECE282C**

B.Tech. 2ⁿᵈ YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits
0	0	2	1

Class Work	: 25
Examination	: 75
Total	: 100
Duration of Exam	: 3 Hours

LIST OF EXPERIMENTS:

1. To study and waveform analysis of amplitude modulation and determine the modulation index ofamplitude modulation.
2. To study and waveform analysis of amplitude demodulation by any method.
3. To study and waveform analysis of frequency modulation and determine the modulation index offrequency modulation.
4. To study and waveform analysis of frequency demodulation by any method.
5. To study Amplitude Shift Keying (ASK) modulation.
6. To study Frequency Shift Keying (FSK) modulation.
7. To study Phase Shift Keying (PSK) modulation.
8. To study and waveform analysis of phase modulation.
9. To study Phase demodulation.
10. To study Pulse code modulation.
11. To study Pulse amplitude modulation and demodulation.
12. To study Pulse width modulation.
13. To study Pulse position modulation.
14. To study delta modulation.
15. To deliver a seminar by each student on Advance CommunicationSystem.

Reference Books:

1. Communication Systems   By Manoj Duhan – I. K. International
2. Electronic Communication Systems   By Kennedy – TMH
3. Communication Systems   By Singh & Sapre – TMH

Course Outcomes:

1. Students will get hands on practical exposure to concepts of AM, FM and PM
2. Students will be able to understand the basics of PAM, PPM and PWM.
3. Students will be able to analyze various digital carrier modulation and demodulation techniques
4. They can analyze noise and disturbance in modulated signals.
   Note:
1 Total ten experiments are to be performed in the semester
2 At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed and set by the concerned institution as per the scope of the syllabus.

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Subject : Analog Circuits   **Subject Code: ECE204C**

B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits		Class Work	: 25
3	0	0	3		Examination	: 75
					Total	: 100
					Duration of Exam	: 3 Hours

Unit 1

Topic no 1 High Frequency Analysis of BJT and Multistage Amplifier:Hybrid Pi Model,
Topic no 2 CE Short Circuit Gain, Frequency Response, Alpha Cut off Frequency,
Topic no 3 Gain Bandwidth Product, Emitter Follower at High Frequencies.
Topic no 4 RC Coupled Transistor Amplifier, Lower & Upper Cut off Frequency,
Topic no 5 Response curve & Bandwidth, Transformer Coupled Amplifier,
Topic no 6 Direct Coupled Amplifier, Cascade Amplifier, Darlington Pair Amplifier,
Topic no 7 Distortion In Amplifiers.
Topic no 8 Feedback Amplifiers: Feedback concept , Transfer Gain with Feedback,
Topic no 9 General Characteristics of Negative Feedback, Advantages & disadvantages,
Topic no 10 Input And Output Resistance, Voltage Series Feedback topology,
Topic no 11Voltage Shunt, Current Series & Current Shunt topology
Topic no 12Equivalent circuit for each topology, Effects of Negative Feedback.

Unit 2

Topic no 13 Oscillators: Introduction, Barkhausen Criterion,
Topic no 14 Oscillator with RC Feedback circuit (RC Phase Shift, Wien Bridge),
Topic no 15 Tuned Collector, Tuned Base Oscillator,
Topic no 16 LC Feedback circuits (Hartley, Colpitts),
Topic no 17 Condition for Sustained Oscillations & Frequency of Oscillations, Crystal Oscillator.
Topic no 18 Power Amplifier**:** Definition, Application & Types of Power Amplifiers,
Topic no 19 Amplifier Classes of Efficiency (Class - A, B, AB, C),
Topic no 20 Push Pull Amplifiers, Distortion in Simple & Push Pull Amplifier,
Topic no 21 Push Pull Amplifier, Integrated Circuit Power Amplifier ,
Topic no 22 Introduction to MOSFET & CLASS D Power Amplifier.

Unit 3

Topic no 23 Voltage Regulators:Voltage Regulation, Basic Series Regulators,
Topic no 24 Basic Shunt Regulators, Power Supply Parameters,
Topic no 25 Basic Switching Regulators, Step up Configuration,
Topic no 26 Step down Configuration, IC Voltage Regulator, SMPS.
Topic no 27 Integrated Circuit Fabrication Process: oxidation, diffusion,
Topic no 28 Ion implantation, photolithography, etching, chemical vapour deposition,
Topic no 29 Sputtering, twin-tub CMOS process.

Unit 4

Topic no 30 Operational Amplifier Fundamentals: Block Diagram Representation,
Topic no 31 Ideal OP-AMP, OP-AMP Equivalent Circuit, Ideal Voltage Transfer Curve,
Topic no 32 Input Offset Voltage, Input Bias Current, Input Offset Current,
Topic no 33 Output Offset Voltage, Thermal Drift,
Topic no 34 Effect of Variation in Power Supply Voltages on Offset Voltage,
Topic no 35 Common Mode Configuration and CMRR,
Topic no 36 Frequency Response of OP-AMP: Open Loop Response
Topic no 37 Close Loop Response, Input and Output Impedances,

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Topic no 38 Effect of Finite Gain Bandwidth Product, Slew Rate.

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Topic no 39 Operational Amplifier Applications:

Topic no 40 Linear and non-linear applications-ADC and DAC,

Topic no 41 Multivibrators,Astable Multivibrator,Monostable Multivibrator

Topic no 42 Bistable Multivibrator, 555 Timer, Monostable & Astable Operation with 555 Timer.

Text/Reference Books:

1. Electronics Device &Circuit   By David.A. Bell - Oxford University Press.
2. Electronics Device & Circuit   By Theodore F. Bogart, Jeffrey.S.Bealey,Guilermo Rico – 6thEdition, Pearson Education.
3. Electronics Device & Circuit   By Robert Boylestad ,Louis Nashelsky, 11th Edition, PearsonEducation, 2015.
4. Electronics Device   By Floyd , 9th Edition, Pearson Education, 2015.
5. Integrated Electronics   By Millman Halkias - TMH.
6. Electronic Devices & Circuits   By B.P Singh and Rekha Singh, 2nd Edition, PearsonEducation.
7. Electronics Device & Circuit   By Sanjeev Gupta.
8. Electronics Device & Circuit   By I. J. Nagrath - PHI
9. Electronic Principles   By Albert Malvino.

Course Outcomes: At the end of the course, students will be able to:

1. Apply knowledge of electronic devices to construct electronic circuits with better applicationsfor our real time causes.
2. Handle higher power capacity devices which will enhance the existing power handling capacityof electronic circuits.
3. Design various power supplies for different circuit requirements in turn help in reducing size ofbatteries.
4. Design same electronic circuits with another very important device i.e. operational amplifier withhigher gain and easy design facilities.

   Note:

   1. In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend onlyfive questions selecting atleast one question from each unit.
   2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

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Subject: Analog Circuits Lab   **Subject Code: ECE284C**

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B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

</div>

L	T	P	Credits
0	0	2	1

Class Work	: 25
Examination	: 75
Total	: 100
Duration of Exam	: 3 Hours

LIST OF EXPERIMENTS:

1. To analyze and study frequency response of RC coupled amplifier.
2. To analyze and study different types of feedback topology.
3. To analyze and study RC phase shift oscillator.
4. To analyze and study wein bridge oscillator.
5. To analyze and study three terminal IC voltage regulator.
6. To draw characteristics of a transistor.
7. To analyze and study CE amplifier and calculate its gain.
8. To analyze and study 555 timer as a square wave generator.
9. To analyze and study SMPS power supply.
10. To analyze and study working of Push-Pull amplifier.

Text/Reference Books:

1. Electronics Device &Circuit   By David.A. Bell - Oxford University Press.
2. Electronics Device & Circuit   By Theodore F. Bogart, Jeffrey.S.Bealey,Guilermo Rico – 6thEdition, Pearson Education.
3. Electronics Device & Circuit   By Robert Boylestad ,Louis Nashelsky, 11th Edition, PearsonEducation, 2015.
4. Electronics Device   By Floyd , 9th Edition, Pearson Education, 2015.
5. Integrated Electronics   By Millman Halkias - TMH.

Course Outcomes: At the end of the course, students will be able to:

1. Apply knowledge of electronic devices to construct electronic circuits with better applications for ourreal time causes.

2. Handle higher power capacity devices which will enhance the existing power handling capacity ofelectronic circuits.

3. Design various power supplies for different circuit requirements in turn help in reducing size ofbatteries.

4. Design same electronic circuits with another very important device i.e. operational amplifier withhigher gain and easy design facilities.

Note:

1 Total ten experiments are to be performed in the semester
2 At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed and set by the concerned institution as per the scope of the syllabus.

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Subject: Microprocessor & Interfacing
Subject Code: ECE206C

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B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

</div>

L	T	P	Credits		Class Work	: 25
3	0	0	1		Examination	: 75
					Total	: 100
					Duration of Exam	: 3 Hours

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Unit 1

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Topic no 1 Overview of microcomputer systems and their building blocks
Topic no 2 Memory interfacing, concepts of interrupts and Direct Memory Access
Topic no 3 Architecture & Instruction set of microprocessors (8086).

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Unit 2

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Topic no 4 Concepts of virtual memory, Cache memory,
Topic no 5 Architecture & Instructions set of X86 family Microprocessors
Topic no 6 (80186, 80286, 80386, 80486).

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Unit 3

</div>

Topic no 7 Enhanced features of Pentium, Pentium Pro, Pentium-II, Pentium-III,
Topic no 8 Pentium-IV, Multi-core Technology, Mobile Processor.

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Unit 4

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Topic no 9 Interfacing with peripherals - Serial I/O, parallel I/O, A/D & D/A converters,
Topic no10 PPI chip, DMA controller, Programmable Interrupt Controller,
Topic no 11 Programmable interval timer chips.

Text / Reference Books:

1. D. V. Hall, Microprocessors and interfacing, Tata McGraw-Hill, 2nd Edition, 2006.
2. Ray A. K. and Burchandi, Advanced Microprocessors and Peripherals Architectures,Programming and Interfacing, Tata McGraw Hill, 2002.
3. Brey, The Intel Microprocessors 8086- Pentium Processor, 8th Edition, Pearson Education.
4. M. A. Mazidi, J. P. Maizidi and Danny Causey, The X86 PC: Assembly Language, Design andinterfacing, 5th Edition, Pearson Education, 2017.
5. Liu Yu-Chang and Gibson Glenn A., Microcomputer Systems: The 8086/8088 Family:Architecture, Programming and Design, 2nd Edition, Pearson Education, 2015.
6. L. B. Das, The X86 Microprocessor (Architecture, Programming and Interfacing), 2nd Edition,Pearson Education, 2014.
7. Daniel Tabak, Advanced Microprocessor", Tata McGraw-Hill, 2nd Edition, 2012.
8. B. Ram, Fundamentals of Microprocessor and Microcomputers, Dhanpat Rai Publications, 5th edition, 2008.

Course Outcomes: At the end of this course, the students will:

1. Understand the architecture & Instruction set of 8086 microprocessor and will be able to doassembly language programming
2. Understand the architecture & Instruction set of X86 family microprocessors and will be able todo assembly language programming
3. Understand the features of advance Microprocessors

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4. Be able to do interfacing design of peripherals.
   Note:
   1. In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.
   2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.
      For student admitted in B. Tech. 1ˢᵗ Year (C-Scheme) in 2019 and all trailing students.

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Subject: Microprocessor & Interfacing Lab   **Subject Code: ECE286C**
B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits		
0	0	2	1		

Class Work	: 25
Examination	: 75
Total	: 100
Duration of Exam	: 3 Hours

LIST OF EXPERIMENTS:

1. To study the architecture of 8086 microprocessor and 8086 microprocessor kit.
2. Write a program to add the contents of the memory location to the content of other memorylocation and store the result in 3rd memory location.
3. Write a program to add 16 bit number using 8086 instruction set.
4. Write a multiplication of two 16 bit numbers using 8086 instruction set.
5. Write a program for division of two 16 bit numbers using 8086 instruction set.
6. Write a program factorial of a number.
7. Write a Program to transfer a block of data with & without overlap.
8. Write a program to find the average of two numbers.
9. Write a Program to check whether data byte is odd or even
10. Write a program to find maximum number in the array of 10 numbers.
11. Write a program to find the sum of the first 'n' integers.
12. Write a program to generate a square wave.
13. Write a program to generate a rectangular wave.
14. Write a program to generate a triangular wave.

Reference Books:

1. D. V. Hall, Microprocessors and interfacing, Tata McGraw-Hill, 2nd Edition, 2006.
2. Ray A. K. and Burchandi, Advanced Microprocessors and Peripherals Architectures,Programming and Interfacing, Tata McGraw Hill, 2002.
3. Brey, The Intel Microprocessors 8086- Pentium Processor, 8th Edition, Pearson Education.
4. M. A. Mazidi, J. P. Maizidi and Danny Causey, The X86 PC: Assembly Language, Design andinterfacing, 5th Edition, Pearson Education, 2017.
5. B. Ram, Fundamentals of Microprocessor and Microcomputers, Dhanpat Rai Publications, 5th edition, 2008.

Course Outcomes: At the end of the course, students will demonstrate the ability to:

1. Do basic assembly language programming of 8086.
2. Do advance assembly language programming of 8086.
3. Do basic assembly language programming of 8086 for interfacing of peripherals.
4. Do advance assembly language programming of 8086 for interfacing of peripherals.

Note:

1 Total ten experiments are to be performed in the semester.
2 At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed and set by the concerned institution as per thescope of the syllabus.

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Subject: Environmental   **Subject Code: MC201C**

Studies B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits
3	0	0	-

Class Work	: 25
Examination	: 75
Total	: 100
Duration of Exam	: 3 Hours

Unit 1

Topic no 1 The Multidisciplinary Nature of Environmental Studies.

Topic no 2 Introduction to Environment: Definition, Scope,

Topic no 3 Importance of environmental studies; need for public awareness.

Topic no 4 Environmental Pollution: Definition, Cause and effects of: Air pollution

Topic no 5 Water pollution, Soil pollution, Marine pollution, Noise pollution,

Topic no 6 Role of an individual in prevention of pollution, Pollution case studies

Unit 2

Topic no 7 Natural Resources: Water resources: over-utilization, floods, drought,

Topic no 8 Dams-benefits and problems; Mineral resources: Use and exploitation

Topic no 9 Environmental effects; Food resources : changes caused by modern agriculture,

Topic no 10 Fertilizer-pesticide problems, water logging, Energy resources

Topic no 11 Growing energy needs, renewable and non renewable energy sources

Topic no 12 Land resources : Land as a resource, land degradation, man induced landslides

Topic no 13 Soil erosion and desertification.

Unit 3

Topic no 14 Ecosystems and Biodiversity: Concept of an ecosystem,

Topic no15 Structure and function, Energy flow, Ecological succession

Topic no 16 Ecological pyramids. Concept of Biodiversity, definition and types,

Topic no 17 Hot-spots of biodiversity; Threats to biodiversity

Topic no 18 Endangered and endemic species of India, Conservation of biodiversity.

Unit 4

Topic no 19 Social Issues and Environment: Water conservation

Topic no 20 Rain water harvesting, Environmental ethics: Issues and possible solutions.

Topic no 21 Climate change, global warming, acid rain, ozone layer depletion,

Topic no 22 Public awareness. Population growth, variation among nations,

Topic no 23 Family Welfare Programme. Human Population and the Environment

Topic no 24 Population growth, Population explosion, Women and Child Welfare.

Reference Books:-

1. A Textbook of Environmental Studies by Asthana D.K. and Asthana Meera
2. Fundamental Concepts in Environmental Studies by Mishra D.D.
3. Environmental Studies by S.C Sharma M.P Poonia
4. Textbook of Environmental Studies for Undergraduate by Erach Bharucha
5. Environmental Studies: Third Edition by R. Rajagopalan

Campus:
Puran Murti Campus
Kami Road, Sonepat (Delhi-NCR), Haryana - 131001, India
Contact no.:7438900900

Website: www.puranmurti.com
E-mail: info@puranmurti.com

Course Outcomes:

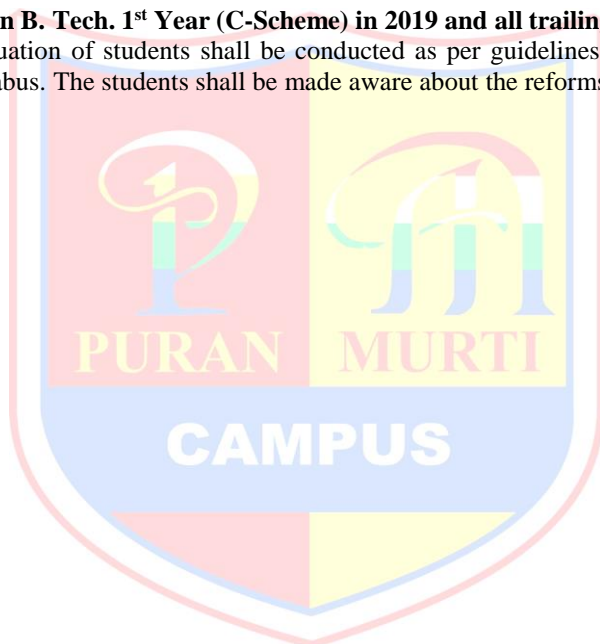At the end of the course, students will demonstrate the ability to:

1. Develop concepts of basic environmental factors.
2. Introduce to the students the basic understanding of ecosystem and its structural and functionalaspects and vast biodiversity
3. Outline aspects of environmental issues.
4. Understand the knowledge of energy resources and their environmental implications

Note:

1. In Semester Examinations, the examiner will set two questions from each unit (total 8 questions in all) covering the entire syllabus. The students will be required to attend only five questions selecting atleast one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

For student admitted in B. Tech. 1st Year (C-Scheme) in 2019 and all trailing students.

Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

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PURAN MURTI
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A Unit of Puran Murti Educational Society
Approved by AICTE ,Recognized Under Section 2 (f) by UGC
Affiliated to Deenbandhu Chhotu Ram University of Science
And Technology, Murthal, Sonipat

Subject: Object Oriented Programming
Subject Code: CSE214C

B.Tech. 2nd YEAR (SEMESTER –IV) CSE214C
Electronics & Communication Engineering

L	T	P	Credits		
3	0	0	3	Class Work	: 25
				Examination	: 75
				Total	: 100
				Duration of Exam	: 3 Hours

UNIT- I: Basic Concepts Of Object Oriented Programming:-

Topic no.1: Procedural Vs. Object oriented,

Topic no.2: C++ Standard Library, Preprocessor Directive

Topic no.3: Illustrative Simple C++ Programs. Header Files and Namespaces,

Topic no.4: library files. Object Oriented Concepts:

Topic no.5: Introduction to Objects and Classes, Data Abstraction,

Topic no.6: Encapsulation (Information Hiding), Access Modifiers:

Topic no.7: Controlling access to a class,

Topic no.8 Method, or variable (public, protected, private),

Topic no.9 Polymorphism, Inheritance, and Reusability **Classes: -**

Topic no.10 Introduction, Structure Vs. Class, Class Scope and Accessing Class

Topic no.11 Initializing Class

Topic no.12: Objects: Constructors.

UNIT- II Destructors, Friend Functions And Operator Overloading:-

Topic no.13: Destructors, Static Class Members, Const(Constant)

Topic no.14: Object And Const Member Functions, Object as Member of Classes,

Topic no.15: Friend Function and Friend Classes, Using This Pointer,

Topic no.16: Dynamic Memory Allocation with New

 Topic no.17: Container Classes and Iterators, Function

Operator Overloading:

Topic no.18: Introduction, Fundamentals of Operator

Topic no.19: Restrictions on Operators Overloading,

Topic no.20: Operator Functions as Class Members vs. as Friend

Topic no.21: Overloading Binary Operators (+,-,*, /,=),

Topic no.22: Overloading Unary Operators(-,++,--,)

UNIT- III: Inheritance and Virtual Functions:-

Topic no.23: Introduction, Types of Inheritance, Base Classes And Derived Classes,

Topic no.24: Virtual Base class, Casting Base Class Pointers to Derived- Class Pointers,

Topic no.25: Using Member Functions,

Topic no.26: Overriding Base - Class Members in aDerived Class,

Topic no.27: Public, Protected and Private Inheritance,

Topic no.28: Using Constructors and Destructors in derived Classes,

Topic no.29: Composition Vs. Inheritance, Overloading Vs. Overriding.

Topic no.30: Run Time Polymorphism, Introduction to Virtual Functions,

Topic no.31: Pure Virtual Functions, Abstract Base Classes and Concrete

Topic no.31: Dynamic Binding, Virtual Destructors, Dynamic Binding.

UNIT-IV Files, Templates and Exception Handling: -

Topic no.32: Files and I/O Streams and various operation on files.

Topic no.33: Stream Input/output Classes and Objects,

Topic no.34: Stream Output, Stream Input, Unformatted I/O (with read and write),

Topic no.35: Stream Manipulators, Stream Format States, Stream Error States.

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Templates & Exception Handling: -

Topic no.36: Function Templates, Overloading Template Functions,

Topic no.37: Class Template, Class Templates and Non-Type Parameters,

Topic no.38: Templates and Inheritance, Templates and Friends.

Basics of C++ Exception Handling: -

Topic no.39:Try Throwing, Catch, and Throwing an Exception; -

Topic no.40: Catching an Exception, Re-throwing an Exception,

Topic no.41: Processing Unexpected Exceptions,

Topic no.42: Constructors, Destructors and Exception Handling

Reference Books:

1. Object Oriented Programming in Turbo C++ by Robert Lafore ,1994, The WAITE Group Press.
2. Programming with C++ By D Ravichandran, 2003, T.M.H
3. Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill
4. C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
5. Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,
6. The Complete Reference in C++ By Herbert Schildt, 2002, TMH.
7. C++ Programming Fundamentals by Chuck Easttom, Firewall Media.

Course Outcomes: At the end of the course, students will be able to:

1. Specify simple abstract data types and design implementations, using abstraction functions todocument them.

2. Recognise features of object-oriented design such as encapsulation, polymorphism, inheritance,and composition of systems based on object identity.

3. Name and apply some common object-oriented design patterns and give examples oftheir use.

4. Design applications with an event-driven graphical user interface.

Note:

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2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

   For student admitted in B. Tech. 1ˢᵗ Year (C-Scheme) in 2019 and all trailing students.

   Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.

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Subject: Object Oriented Programming Lab   **Subject Code: CSE284C**
B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits		Class Work	: 25
0	0	2	1		Examination	: 75
					Total	: 100
					Duration of Exam	: 3 Hours

LIST OF EXPERIMENTS:

1. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called power ( ) that takes a double value for n and an int value for p, and returns the result as double value Use a default argument of 2 for p. so that if this argument is omitted, the number will be squared. Write a main ( ) function that gets values from the user to test thisfunction.

2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinate.
    Write a program that uses a structure called point to model a point Define three points, and have the user input values to two of them Then set the third point equal to the sum of the other two. and display the value of the new point Interaction with the program might look like this:

    Enter coordinates for PI :   3   4

    Enter coordinates for P2:   5   7

    Coordinates of PI + P2 are: 8   11

3. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding. subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should display the result.
     When it finishes the calculation, the program should ask if the user wants to do another calculation.The response can be 'Y' or 'N'. Some sample interaction with the program might look like this.
    Enter first number. Operator, second number: 10/3Answer = 3.333333

    Do another (YI N)? Y

    Enter first number. Operator, second number 12 + 100Answer = 112
    Do another (Y I N)? N

4. Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that can read values forthe class objects and add one object of DM with another object of DB.
    Use a friend function to carry out the addition operation. The object that stores the results maybe DM object or

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DB object. depending on the units in which the results are required. The display should be in the format of feet and inches or metres and centimetres depending on object on display.

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5 Create a class rational which represents a numerical value by two double values- NUMERATOR & DENOMINATOR Include the following public member Functions:

- constructor with no arguments (default).

- constructor with two arguments.

- void reduce( ) that reduces the rational number by eliminating the highest commonfactor between the numerator and denominator.

- Overload + operator to add two rational number

- Overload » operator to enable input through cin

- Overload « operator to enable output through cou1.

- Write a main ( ) to test all the functions in the class.

6 Write a program that creates a binary file by reading the data for the students from the terminal. The data of each student consist of roll no., name (a string of 30 or lesser no. of characters) and marks.

7 A hospital wants to create a database regarding its indoor patients. The information to store include

- Name of the patient

- Date of admission

- Disease

- Date of discharge

Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to enter information and display a list of all the patients in the database. Create a derived class to storethe age or the patients List the information about all the to store the age of the patients. List the information about an the pediatric patients (less than twelve years in age).

8 Make a class Employee with a name and salary. Make a class Manager inherit from Employee. Add an instance variable, named department, of type string. Supply a method to toString that prints the manager's name, department and salary. Make a class Executive inherit from Manager Supply a method to String that prints the string Executive followed by the information stored in the Manager superclass object. Supply a test program that tests these classes and methods.

9   Imagine a tollbooth with a class called toll Booth. The two data items of a type unsigned intto hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called payingCar ( ) increments the car total and adds 0.50 to the cash total. Another function, called nopayCar ( ). increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals.

Text/Reference Books:

1. Object Oriented Programming in Turbo C++ by Robert Lafore ,1994, The WAITE Group Press.

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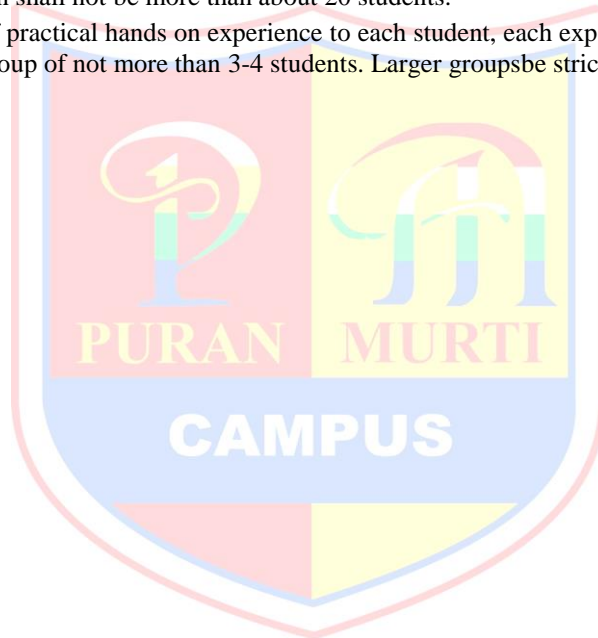**And Technology, Murthal, Sonipat**

2. Programming with C++ By D Ravichandran, 2003, T.M.H
3. Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill
4. C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
5. Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,
6. The Complete Reference in C++ By Herbert Schildt, 2002, TMH.
7. C++ Programming Fundamentals by Chuck Easttom, Firewall Media.

Course Outcomes: At the end of the course, students will demonstrate the ability to:
1. Use the characteristics of an object-oriented programming language in a program.
2. Use the basic object-oriented design principles in computer problem solving.
3. Use the basic principles of software engineering in managing complex software project.
4. Program with advanced features of the C++ programming language.

Note:-
1. Each laboratory class/section shall not be more than about 20 students.
2. To allow fair opportunity of practical hands on experience to each student, each experiment may either done by each student individually or in group of not more than 3-4 students. Larger groupsbe strictly discouraged/disallowed

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And Technology, Murthal, Sonipat

Subject: Numerical Methods   **Subject Code: MATH211C**

B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits		Class Work	: 25
3	0	0	3		Examination	: 75
					Total	: 100
					Duration of Exam	: 3 Hours

Unit 1

Topic no 1 Solution of Polynomial and Transcendental Equations, Bisection Method,

Topic no 2 Newton-Raphson Method and Regula-Falsi. Finite differences,

Topic no 3 Relation between operators, Interpolation using Newton's,

Topic no 4 forward and backward difference formulae.

Topic no 5 Interpolation with unequal intervals: Newton's divided difference

Topic no 6 Lagrange's formulae.

Unit 2

Topic no 7 Simultaneous Linear Equations: Elimination Method, Gauss and Gauss-Jordan

Topic no 8 Method, Jacobi's Method, Gauss-Seidal Method, Relaxation Method.

Topic no 9 Numerical Differentiation and Integration: Derivatives from difference tables,

Topic no 10 Higher order derivatives, Extrapolation Techniques

Topic no 11Newton-Cotes integration formula, Trapezoidal rule, Simpson's rule,

Topic no 12 Boole's rule , Weddle's rule, Romberg's integration

Unit 3

Topic no 13 Ordinary differential equations: Taylor's series, Euler's methods,

Topic no 14 Methods Runge-Kutta Method of Fourth Order for solving first and second order equations.

Topic no15 Milne's and Adam's Predicator-Corrector Methods.

Topic no 16 Power Method for Eigen values by Interations.

Unit 4

Topic no17 Partial Differential Equations

Topic no 18 Finite difference solution two dimensional Laplace equation and Poisson equation,

Topic no 19 Implicit and explicit methods for one dimensional heat equation

Topic no19 (Bendre-Schmidt and Crank-Nicholson Methods

Topic no 20 Finite difference explicit Method for Wave Equation, Dufort and Frankel Method.

Text/Reference Books:

1. P. Kandasamy,. K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Co. 2ndEdition, Reprint 2012.
2. S.S. Sastry, Introductory methods of Numerical Analysis, PHI, 4th Edition, 2005
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th, Edition, 2010.

Course Outcomes: At the end of the course:

1. The students will understand to find the solutions of various kinds of first order ordinaryDifferential equations.
2. The student will understand second order differential equations and to find their solutions alongwith variable coefficients, power series, Legendre's and Bessel's equations.

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3. The students will learn to solve polynomial, algebraic and Transcendental equations by variousMethods, interpolations, Numerical Differentiation and numerical Integration.

4. The students will be able to find numerical solutions of Ordinary Differential Equations of firstand second order and of Partial Differential Equations by various methods.

Note:

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Subject: Numerical Methods Lab
Subject Code: MATH213C

B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits		
0	0	2	1		

Class Work	: 25
Examination	: 75
Total	: 100
Duration of Exam	: 3 Hours

LIST OF EXPERIMENTS:

Write down and execute the following programs using c/c++/matlab

1. To find the roots of non-linear equations using Bisection method
2. To find roots of non-linear equation using Newton's method
3. Curve fitting by least square approximations
4. To solve system of linear equations using Gauss-Elimination method
5. To solve system of linear equations using Gauss-Seidal iteration method
6. To solve system of linear equation using Gauss-Jordan method
7. To integrate numerically using Trapezodal rule
8. T integrate numerically using Simpsons's rule
9. To find largest Eigen value of a matrix by power-method
10. To find numerical solution of ordinary differential equations by Euler's method
11. To find numerical solution of ordinary differential equations by Runge-Kutta method
12. To find numerical solution of ordinary differential equations by Milne's method
13. To find numerical solution of Laplace equation
14. To find numerical solution of wave equation
15. To find numerical solution of heat equation

Text/Reference Books:

1. Applied Numerical Analysis by Curtis F. Gerald and Patrick G. Wheatley-Pearson, Edu. Ltd.
2. Numerical Methods: E.Balaguruswamy T.M.H

Course Outcomes: At the end of the course:

1. The students will understand to find the solutions of various kinds of first order ordinaryDifferential equations.
2. The student will understand second order differential equations and to find their solutions alongwith variable coefficients, power series, Legendre's and Bessel's equations. .
3. The students will learn to solve polynomial, algebraic and Transcendental equations by variousMethods, interpolations, Numerical Differentiation and numerical Integration.
4. The students will be able to find numerical solutions of Ordinary Differential Equations of firstand second order and of Partial Differential Equations by various methods.

Note:-

1. Each laboratory class/section shall not be more than about 20 students.
2. To allow fair opportunity of practical hands on experience to each student, each experiment may either done by each student individually or in group of not more than 3-4 students. Larger groupsbe strictly discouraged/disallowed.
3. Ten experiments are to be performed out of which at least seven experiments should be performed from the above list. Remaining three experiments should be performed from the above list or designed and set by the concerned department as per the scope of the syllabus.

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Website: www.puranmurti.com
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Subject: Database Management Systems
Subject Code: CSE303C

<div align="center">

B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering
(Common with 5th Semester CSE)

</div>

L	T	P	Credits		Class Work	: 25
3	0	0	3		Examination	: 75
					Total	: 100
					Duration of Exam	: 3 Hours

UNIT- I: Database system architecture: -

Topic no.1: Data Abstraction, Data Independence,

Topic no.2: Data Definition Language (DDL),

Topic no.3: Data Manipulation Language (DML).Data models: -

Topic no.4: Entity-relationship model, network model,

Topic no.5: Relational and object oriented data models,

Topic no.6: Integrity constraints, data manipulation operations.

UNIT-II Relational query languages:-

Topic no.7:Relational algebra, Tuple and domain relational calculus,

Topic no.8: SQL3, DDL and DML constructs,

Topic no.9 Open source and Commercial DBMS –MYSQL, ORACLE, DB2, SQL server.Relational database design: -

Topic no.10:Domain and data dependency,

Topic no.11:Armstrong's axiom, Normal forms,

Topic no.12: Dependency preservation, Lossless design.Query processing and optimization: -

Topic no.13:Evaluation of relational algebra expressions,

Topic no.14: Query equivalence, Join strategies,

Topic no.15:Query optimization algorithms.

UNIT- III

Topic no.16: Concurrency control, ACID property,

Topic no.17: Serializability of scheduling, Locking and timestamp based schedulers,

Topic no.18: Multi-version and optimistic Concurrency Control schemes,

Topic no.19: Database recovery.

UNIT- IV

Topic no.20: Authentication, Authorization and access control,

Topic no.21: DAC, MAC and RBAC models, Intrusion detection,

Topic no.22: SQL injection. Advanced topics: Object oriented and object relational databases,

Topic no.23: Logical databases, Web databases,

Topic no.24: Distributed databases, Data warehousing and data mining.

Text/Reference Books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S.Sudarshan, McGraw-Hill
2. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, ComputerScience Press.
3. "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, PearsonEducation
4. "Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu,Addison-Wesley.
5. An introduction to **Database Systems**. Author : C J Date. Publisher : Wesley

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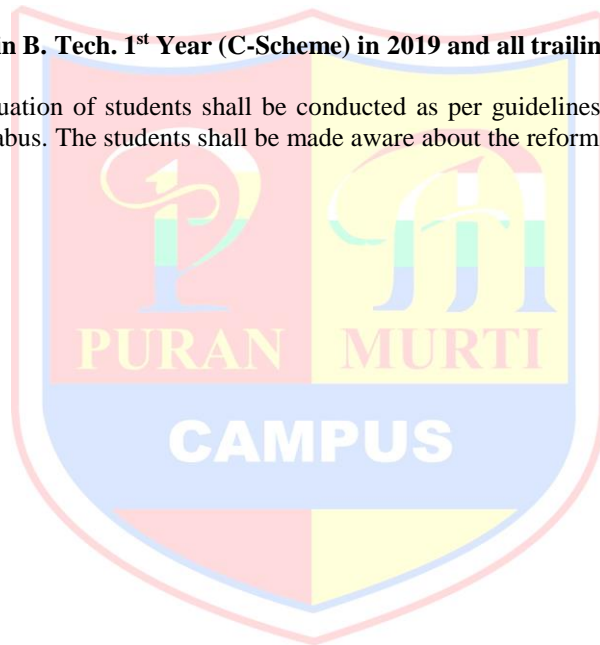
Course Outcomes: At the end of the course:

1. Write relational algebra expressions for the query and optimize the developed expressions anddesign the databases using ER method and normalization for a given specification of the requirement
2. Construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, andDB2 for a given specification
3. Determine the transaction atomicity, consistency, isolation, and durability for a giventransaction-processing system,
4. Implement the isolation property, including locking, time stamping based on concurrency controland Serializability of scheduling.

Note:

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2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

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Subject Code: Database Management System Lab   **Subject Code: CSE383C**

B.Tech. 2nd YEAR (SEMESTER –IV)
Electronics & Communication Engineering

L	T	P	Credits
0	0	2	1

Class Work	: 25
Examination	: 75
Total	: 100
Duration of Exam	: 3 Hours

LIST OF EXPERIMENTS:

1. Study of oracle 11g interface, with different types of installations, Accounts and privileges inOracle 11g.
2. Study of various Data Types and Data Objects in SQL
3. Implementation of Data Definition Language (DDL) Commands in SQL
4. Implementation of Data Manipulation Language (DML) Commands in SQL.
5. Implementation of various aggregate functions in SQL with group by and Having Clause.
6. Implementation of various String functions in SQL.
7. Implementation of various Date Functions in SQL.
8. Implementation of Data Control Language (DCL) Commands in SQL
9. Implantation of Data Integrity Constraints in SQL
10. Implementation of Different types of Views in SQL.
11. Implementation Nested Queries (Simple and Correlated) in SQL.
12. Implementation of JOINS (Natural, Equi, Theta, Inner, Outer) in SQL.
13. Implementation of SET Operations (UNION,INTER-SECTION, SET DIFFERENCE) in SQL
14. Implementation of SQL Commands related to Database recovery and Concurrency Control inDBMS.
15. Implementation different types of Index in SQL.

Text/Reference Books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S.Sudarshan, McGraw-Hill
2. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, ComputerScience Press.
3.   "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, PearsonEducation

Course Outcomes: At the end of the course:

1. Student will be able to know basics of SQL.
2. Student will be able to construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, and DB2 for a given specification.
3. Student will be able to implement SET Operations in SQL.
4. Student will be able to implement different types of Index in SQL.

Note:-

1. Each laboratory class/section shall not be more than about 20 students.
    To allow fair opportunity of practical hands on experience to each student, each experiment may either done by each student individually or in group of not more than 3-4 students. Larger groups be strictly discouraged/disallowed.

Campus:
Puran Murti Campus   Website: www.puranmurti.com
Kami Road, Sonepat (Delhi-NCR), Haryana - 131001, India   E-mail: info@puranmurti.com
Contact no.:7438900900

PURAN MURTI
C A M P U S

A Unit of Puran Murti Educational Society
Approved by AICTE ,Recognized Under Section 2 (f) by UGC
Affiliated to Deenbandhu Chhotu Ram University of Science
And Technology, Murthal, Sonipat

Subject: Constitution of India
Subject Code: MC203C

Study Scheme				Evaluation Scheme			Total Marks
Lecturesper week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	2 5	75	3 hours	100

Unit 1 Philosophy of Indian Constitution:
        Topic No 1 Ideological Basis and Salient Features of Indian Constitution,
        Topic No 2 Fundamental Rights & Duties of the Citizens**,**
        Topic No3 Directive Principles of State Policy

Unit 2 Nature and Dynamics of Indian Federalism:

        Topic No 4 Federalism: Theory and Practice in India,
        Topic No 5 Federal Features of the Indian Constitution**,** Legislative,
        Topic No 6 Administrative and Financial Relations between the Union and the States.

Unit 3 Union and State Legislature :
        Topic No 7 Parliament: Composition, Functions and Working of the Parliamentary system
        Topic No 8 State Legislature:
        Topic No 9 Composition and Functions of Vidhan Sabha/ Vidhan Parishad

Unit 4 Centre and State: Executive and Judiciary:
        Topic No 10 President,
        Topic No 11 Prime Minister and Council of Ministers **,**
        Topic No 12 Governor,
        Topic No 13 Chief Minister and Council of Ministers**,** Judiciary:
        Topic No 14 Supreme Court;
        Topic No 15 High Court

Text Books:
1. Austin G., The Indian Constitution: Corner Stone of a Nation, New Delhi: Oxford UniversityPress, 196
2. Basu D.D., An Introduction to the Constitution of India, New Delhi: Prentice Hall, 1994
3. Kothari R., Politics in India, New Delhi: Orient Language, 1970
4. Siwach J.R., Dynamics of Indian Government and Politics, New Delhi: Sterling Publishers,1985

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And Technology, Murthal, Sonipat

Subject: Environmental StudiesSubject
Code: MC201C

Study Scheme				Evaluation Scheme			Total Marks
Lecturesper week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

UNIT – I Environmental Studies and Environmental Pollution

Topic No 1 The Multidisciplinary Nature of Environmental Studies,
Topic No 2 Introduction to Environment:
Topic No 3 Definition, Scope, and importance of environmental studies;
Topic No 4 Need for public awareness.
Topic No 5 Environmental Pollution: Definition, Cause and effects
Topic No 6 Air pollution,
Topic No7 Water pollution
Topic No8 Soil pollution,
Topic No 9 Marine pollution,
Topic No10 Noise pollution,
Topic No 11 Role of an individual in prevention of pollution,
Topic No 12 Pollution case studies

UNIT – II Natural Resources:

Topic No13 Water resources: over-utilization, floods, drought, dams-benefits and problems;
Topic No14 Mineral resources: Use and exploitation, environmental effects;
Topic No15 Food resources: changes caused by modern agriculture, fertilizer-pesticideProblems, water logging,
Topic No16 Energy resources: Growing energy needs, renewable and non renewable energySources;
Topic No17 Land resources: Land as a resource, land degradation, man induced landslides,
Topic No18 Soil erosion and desertification.

UNIT – III Ecosystems and Biodiversity

Topic No 19 Concept of an ecosystem,
Topic No 20 Structure and function,
Topic No 21 Energy flow,
Topic No 22 Ecological succession,
Topic No 23 Ecological pyramids.
Topic No24 Concept of Biodiversity, definition and types,
Topic No25 Hot-spots of biodiversity; threats to biodiversity,
Topic No26 Endangered and endemic species of India, Conservation of biodiversity.

UNIT - IV Social Issues and Environment

Topic No 27 Water conservation,
Topic No 28 Rain water harvesting,
Topic No 29 Environmental ethics: Issues and possible solutions.
Topic No 30 Climate change, global warming,

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Topic No 31 Acid rain,

Topic No 32 Ozone layer depletion,

Topic No 33 Public awareness.

Topic No34 Population growth, variation among nations,

Topic No35 Family Welfare Programmed.

Topic No 36 Human Population and the Environment

Topic No 37 Population growth,

Topic No 38 Population explosion,

Topic No 39 Women and Child Welfare.

Field Work –

1. Visit to a local area to document environmental assets—river/forest/grassland/hill/ mountain.

2. Visit to a local polluted site—Urban/Rural/Industrial/Agricultural.

3. Study of common plants, insects, birds.

4. Study of simple ecosystems—pond, river, hill slopes, etc

<div align="center">REFERNCE BOOKS:</div>

1. A Textbook of Environmental Studies by Asthana D.K. and Asthana Meera
2. Fundamental Concepts in Environmental Studies by Mishra D.D.
3. Environmental Studies by S.C Sharma M.P Poonia
4. Textbook of Environmental Studies for Undergraduate by Erach Bharucha
5. Environmental Studies: Third Edition by R. Rajagopalan

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