FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS

FOR

B. TECH.
(COMPUTER ENGINEERING)
(Credit Based Evaluation and Grading System)
(SEMESTER: I – IV)
Session: 2019–20

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GURU NANAK DEV UNIVERSITY
AMRITSAR

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER *SYSTEM*
(Credit Based Evaluation and Grading System)

Eligibility:
  a) Senior Secondary Examination (12th grade) with Physics, Chemistry, Mathematics and English with at least 50% marks in aggregate.
  b) Any other examination recognized equivalent thereto by GND University, Amritsar.

S. NO.	Course Code	Course	L	T	P	CREDITS
		Semester – I				
1.	CEL120	Engineering Mechanics	3	1	0	4
2.	MEL120	Engineering Graphics & Drafting	2	0	2	4
3.	MTL101	Mathematics-I	3	1	0	4
4.	PHL183	Physics	3	1	1	5
5.	MEL110	Introduction to Engg. Materials	3	0	0	3
6.		Elective–I	2	0	0	2
		Total	**16**	**3**	**3**	**22**
		List of Electives–I				
1.	PBL121	Punjabi (Compulsory) OR	2	0	0	2
2.	* HSL101	Punjab History & Culture (1450-1716) **OR**	2	0	0	2
3.	* PBL 122	ਮੁੱਢਲੀ ਪੰਜਾਬੀ	2	0	0	2
4.	**SOA101	Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)	3	0	0	3

Note:

1. *** Special Paper in lieu of Punjabi Compulsory, For those students who are not domicile of Punjab**

2. **** Student can opt this Paper whether in 1st or 2nd Semester.**

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER *SYSTEM*
(Credit Based Evaluation and Grading System)

S. NO.	Course Code	Course	L	T	P	CREDITS
		Semester – II				
1.	CYL197	Engineering Chemistry	3	0	1	4
2.	MTL102	Mathematics-II	3	1	0	4
3.	ECL119	Basic Electrical &Electronics Engineering	4	0	1	5
4.	CSL126	Fundamentals of IT & Programming using Python	2	1	1	4
5.	ENL101	Communicative English	2	0	0	2
6.		Elective-II	2	0	0	2
7.	MEP101	Workshop Practices	0	0	2	2
		Total	**16**	**2**	**5**	**23**
		List of Electives–II				
1.	PBL131	Punjabi (Compulsory) OR	2	0	0	2
2.	*HSL102	Punjab History & Culture (1717-1947) **OR**	2	0	0	2
3.	*PBL132	ਮੁੱਢਲੀ ਪੰਜਾਬੀ	2	0	0	2
4.	**SOA102	Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)	3	0	0	3

Note:

1. *** Special Paper in lieu of Punjabi Compulsory, For those students who are not domicile of Punjab**

2. **** Student can opt this Paper whether in 1ˢᵗ or 2ⁿᵈ Semester.**

3. **PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory ID Course) Students can opt. in any semester except Semester 1ˢᵗ. This ID Course is one of the total ID courses.**

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER *SYSTEM*
(Credit Based Evaluation and Grading System)

S. NO.	Course Code	Course	L	T	P	CREDITS
		Semester – III				
1.	CSL231	Data Structures & Programming Methodology	3	1	0	4
2.	CSL233	Programming in C++	2	1	2	4
3.	ESL220	Environmental Studies (Compulsory ID Course)	4	0	0	4
4.	ECL291	Digital Circuits & Logic Design	3	0	2	4
5.	ENL201	Written & Oral Technical Communication	2	1	2	4
6.		Interdisciplinary Course–I	4	0	0	4
		Total:	**18**	**3**	**8**	**24**

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER *SYSTEM*
(Credit Based Evaluation and Grading System)

		Semester – IV				
S. NO.	**Course Code**	**Course**	**L**	**T**	**P**	**CREDITS**
1.	CSL240	Operating System	2	1	2	4
2.	CSL241	Data Communication	3	0	2	4
3.	CSL243	System Programming	3	1	0	4
4.	CSL244	Discrete Structures	3	1	0	4
5.	CSL245	Computer Architecture	3	1	0	4
6.		Interdisciplinary Course–II	4	0	0	4
		Total:	**18**	**4**	**4**	**24**

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

Course Name	:	**Engineering Mechanics**
Course Code	:	**CEL-120**
Credits (L-T-P)	:	**4 (3-1-0)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Internal Marks: 20	External Marks: 80

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
• To understand distributed force systems, centroid/ centre of gravity and method of finding centroids of composite figures and bodies.   • To understand moment of inertia and method of finding moment of inertia of areas and bodies.   • To understand dynamics of a particle.   • To understand the kinetics of rigid bodies and simple problems.

Total No. of Lectures –36

Lecture wise breakup	Number of Lectures

Note: Eight questions are to be set by selecting two questions from each section. Each question is divided in subsections (not exceeding 4). The candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.

SECTION - A	
1	Introduction: Force system, dimensions and units in mechanics, laws of mechanics,vectoralgebra, addition and subtraction of forces, cross and dot products of vectors, moment of aforceabout a point and axis, couple and couple moment, transfer of a force to a parallelposition, resultant of a force system using vector method, Problems involving vector application. Equilibrium: Static and dynamic equilibrium, static in determinacy, general equations of equilibrium, Varingnon's theorem, Lami's theorem, equilibrium of bodies under a forcesystem,Problems.	9

	SECTION - B	
2	Truss and Frames: Truss, classification of truss, assumptions in truss analysis, perfect truss, analysis of perfect plane truss using method of joints and method of sections, Problems. Centroid, Centre of mass and Centre of gravity, Determination of centroid, centre of mass and centre of gravity by integration method of regular and composite figures and solid objects, Problems.	9
	SECTION - C	
3	Moment of Inertia: Area moment of inertia, mass moment of inertia, parallel axis and perpendicular axis theorems, radius of gyration, polar moment of inertia, product of inertia, principle axis, problem based on composite figures and solid objects. Kinematics: Concept of rigid body, velocity and acceleration, relative velocity, translation and rotation of rigid bodies, equations of motion for translation and rotation, problems.	9
	SECTION - D	
4	Particle Dynamics: Energy methods and momentum methods, Newton's laws, work energy equation for a system of particles, linear and angular momentum equations, projectile motion, problem. Shear Force and Bending Moment Diagram for statically determinant beams Classification of beams, types of loads, shear force and bending moment calculation and their graphical presentation, point of inflection, problem.	9

Course Outcomes:	
1	Basic understanding of laws and principles of mechanics.
2	Ability to analyse and solve simple problems of mechanics.
3	An understanding of assumptions and limitations of approaches used.

Suggested / Reference Books:	
1	Engineering Mechanics – Irving H. Shames, PHI Publication.
2	Engineering Mechanics – U.C.Jindal, Galgotia Publication.
3	Mechanics–Berkeley Physics Course, Vol–I (Second Edition): C. Kittel, W.D. Knight, M.A. Ruderman, C.A. Helmholtz and R.J. Moyer–Tata McGraw Hill Publishing Company Ltd., New Delhi.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

Course Name	:	**Engineering Graphics & Drafting**
Course Code	:	**MEL-120**
Credits (L-T-P)	:	**4 (2-0-2)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Internal Marks: 20	External Marks: 80

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
At the end of this course, the student should be able to understand the
1. Increase ability to communicate with people
2. Learn to sketch and take field dimensions.
3. Learn to take data and transform it into graphic drawings.
4. Learn basic CAD skills.
5. Learn basic engineering drawing formats
6. Prepare the student for future Engineering positions

Total No. of Lectures – 48

Lecture wise breakup	Number of Lectures
Note: Eight questions are to be set by selecting two questions from each section. Each question is divided in subsections (not exceeding 4). The candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.	
SECTION - A	
1. Introduction: Instruments used, Lettering, Types of Lines used, Scales, Types of Projections in use, Dimensioning of Figures, etc.; Orthographic Projections of Points, Lines & Lamina **Lab Work:** Introduction to AutoCAD, Practice of 2D commands, Exercises related to the theory contents of this section.	6
SECTION - B	
2. Projection of Solids: Section of Solids & its Projections; Interpenetration of Solids & Curve of Interpenetration; Development of Surfaces. **Lab Work:** Familiarity with 3D commands, Exercises related to the theory contents of this section.	6

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

SECTION - C		
3	Isometric Drawing & Isometric Projection **Lab Work:** Lab Exercises related to the theory contents of this section.	6
SECTION - D		
4	Free-Hand sketching of Engineering Components, Advance 3D Commands: Solving Problems using AutoCAD. **Lab Work:** Lab Exercises related to the theory contents of this section.	6

Course Outcomes:	
1	Student's ability to hand letter will improve.
2	Student's ability to perform basic sketching techniques will improve.
3	Students will be able to draw orthographic projections and sections.
4	Student's ability to use architectural and engineering scales will increase.
5	Students ability to produce engineered drawings will improve
6	Student's ability to convert sketches to engineered drawings will increase.
7	Students will become familiar with office practice and standards.
8	Students will become familiar with two and three dimensional drawings.
9	Students will develop good communication skills and team work.

Suggested / Reference Books:	
1	Engineering Drawing, N. D. Bhatt
2	Engineering Graphics with AutoCAD, James D. Bethune
3	Engineering Drawing & Graphics, K. Venugopal
4	Engineering Drawing PS Gill
5	Engineering Drawing, M. B. Shah & B. C. Rana

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
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Course Name	:	Mathematics-I
Course Code	:	MTL-101
Credits (L-T-P)	:	4 (3-1-0)
Total Marks	:	100
Mid Semester	:	20% weightage
End Semester	:	80% weightage

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
The aim of the course is to introduce the important topics of mathematics to future engineers which they would find useful in their respective engineering branches. This course would act as foundation for the students with basic as well as advanced concepts for familiarizing them with the use of mathematics to the real life and problems associated with their respective disciplines.

Total No. of Lectures –

	Lecture wise breakup	Number of Lecture
	SECTION - A	
1	**Matrices:** Introduction to matrices, Inverse and rank of a matrix, rank-nullity theorem; Symmetric, skew-symmetric and orthogonal matrices, Hermitian and skew-Hermitian matrices, Unitary matrix, Determinants; System of linear equations; Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem.	10
	SECTION - B	
2	**Infinite Series:** Convergence and divergence of infinite series, Geometric series test, Positive term series, p-series test, [Comparison test, D' Alembert's ratio test, Cauchy's root test, Integral test, Raabe's test, Logarithmic test, Gauss's test] (without proofs), Alternating series and Leibnitz's rule, Power series, Radius and interval of convergence.	10

	SECTION - C	
3	**Differential Calculus:** Partial Derivatives, Euler's theorem on homogeneous functions, Maclaurin's and Taylor's expansions of single and two variables, Maxima and minima of functions of several variables, Lagrangian method of multipliers, Multiple integrals and their use in obtaining surface areas and volumes of solids.	12
	SECTION – D	
4	**Vector Calculus:** Scalar and Vector point functions, Differentiation of vectors, Gradient of a scalar field, Divergence and Curl of a vector field, Line integral of a vector field, Surface integral of vector field, Volume integral of a scalar field, Green's theorem, stokes theorem, Gauss divergence theorem (without proofs) and their applications.	12

Course Outcomes:	
1	Students will be able to calculate rank of matrix, characteristic equation & characteristic roots & use the applicability of Caylay Hamilton Theorem to find inverse of matrix which is very important in many engineering application.
2	It will equipped the students in determining whether the given function can be approximated with the power series.
3	Students will learn the various applications of mathematics using vector calculus techniques.

Suggested / Reference Books:	
1	Kreyszig: Engineering Mathematics, Wiley Eastern Ltd.
2	B.S. Grewal: Higher Engineering Mathematics, Khanna Publisher, New Delhi.
3	Louis A. Pipes: Applied Mathematics for Engineers and Physicists, McGraw Hill Book

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
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Course Name	:	Physics
Course Code	:	PHL-183
Credits (L-T-P)	:	5 (3-1-1)
Total Marks	:	100
Mid Semester Examination	:	20% weightage
End Semester Examination	:	80% weightage

Internal Marks: 20	External Marks: 80

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
• To make the students aware about Electromagnetic wave fundamentals.
• To make students aware about quantum physics phenomena.

Total No. of Lectures – 48

Lecture wise breakup	Number of Lectures
Note: Eight questions are to be set by selecting two questions from each section. Each question is divided in subsections (not exceeding 4). The candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.	
SECTION - A	
1 Electric and magnetic fields in a medium, Susceptibility and Conductivity, Maxwell's equations, Boundary conditions; EM wave equation, Plane wave solutions.	9
SECTION - B	
2 Polarization of the EM waves, Pointing vector and intensity of the EM wave; Wave packet, Phase and Group velocities; Reflection and refraction of EM waves at a dielectric interface; Brewster angle; Total internal reflection at a dielectric interface; EM waves in a conducting medium and plasma.	9
SECTION - C	
3 Wave-particle duality, de-Broglie waves; Quantum mechanical operators; Schroedinger equation, Wave function, Statistical interpretation, Superposition Principle, Continuity equation for probability density; Stationary states, Bound states.	9

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

SECTION - D		
4	Free-particle solution, 1-D infinite potential well, Expectation values and uncertainty relations; 1-D finite potential well, Quantum mechanical tunneling and alpha- decay, Kronig-Penny model and emergence of bands	9

Course Outcomes:	
1	This will enable the students to learn physical concepts associated with electromagnetic radiation and devices.
2	Student will understand quantum mechanical aspects of physics.

Suggested / Reference Books:	
1	Concepts of Modern Physics. Arthur Beiser, (Tata McGraw-Hill, Sixth Edition 2003).
2	Lasers & Nonlinear optics. B.B. Laud (New Delhi, India: Wiley Eastern 1991).

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

Course Name	:	**Introduction to Engineering Materials**
Course Code	:	**MEL110**
Credits (L-T-P)	:	**3 (3-0-0)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Internal Marks: 20	External Marks: 80

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
At the end of this course, the student should be able to understand the: 1. To review physics and chemistry in the context of materials science & engineering. 2. To describe the different types of bonding in solids, and the physical outcomes of these differences. 3. Give an introduction to metals, ceramics, polymers, and electronic materials in the context of a molecular level understanding of bonding. 4. Give an introduction to the relation between processing, structure, and physical properties. 5. Give the beginning student an appreciation of recent developments in materials science & engineering within the framework of this class.

Total No. of Lectures – 47

Lecture wise breakup	**Number of Lectures**
Note: Eight questions are to be set by selecting two questions from each section. Each question is divided in subsections (not exceeding 4). The candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.	
SECTION - A	
1 Introduction**:** Historical perspective, scope of materials science and engineering. Atomic structure and interatomic bonding. Lattices, basic idea of symmetry.	9

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

SECTION – B	
2	Lattice structure: Bravais lattices, unit cells, crystal structures, crystal planes and directions,co-ordinationnumber.Singlecrystals,polycrystalline,non-crystalline,nano-crystallinematerials.Imperfections in solids: point defects, line defects, surfaced effects.	9

SECTION - C	
3	Solid solutions: phases, phase diagrams. Diffusion phenomenon, phase transformations. Strengthening mechanisms.	9

SECTION - D	
4	Classification of materials: properties of materials. Structure, properties and applications of different metals and alloys, ceramics, composites and polymers.	9

Course Outcomes:	
1	Given a type of material, be able to qualitatively describe the bonding scheme and its general physical properties, as well as possible applications.
2	Given a type of bond, be able to describe its physical origin, as well as strength.
3	Be able to qualitatively derive a material's Young's modulus from a potential energy curve.
4	Given the structure of a metal, be able to describe resultant elastic properties in terms of its 1D and 2D defects.
5	Be able to do simple diffusion problems.

Suggested / Reference Books:	
1	Materials Science and Engineering by W.D. Callister Jr. (John Wiley & Sons Inc., Eighth Edition).
2	Materials Science and Engineering: A First Course by V. Raghvan (Prentice-Hall of India Pvt. Ltd.).

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

(ELECTIVES)

PBL 121: ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - I

Credit: 2-0-0
Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਸੈਕਸ਼ਨ-ਏ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰੋਂ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ)   ਭਾਈ ਵੀਰ ਸਿੰਘ
(ਅ)   ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਿਕ
(ੲ)   ਪ੍ਰੋ. ਪੂਰਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਗੁਰਮੁਖੀ ਆਰਥੋਗਰਾਫੀ ਦੀ ਜੁਗਤ (ਪੈਂਤੀ, ਮੁਹਾਰਨੀ, ਬਿੰਦੀ, ਟਿੱਪੀ ਤੇ ਅੱਧਕ); ਵਿਸਰਾਮ ਚਿੰਨ੍ਹ, ਸ਼ਬਦ ਜੋੜ (ਸ਼ੁਧ-ਅਸ਼ੁਧ)

ਸੈਕਸ਼ਨ-ਬੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰੋਂ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ)   ਫਿਰੋਜ਼ਦੀਨ ਸ਼ਰਫ
(ਅ)   ਪ੍ਰੋ. ਮੋਹਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਲੇਖ ਰਚਨਾ (ਜੀਵਨੀ-ਪਰਕ, ਸਮਾਜਕ ਅਤੇ ਚਲੰਤ ਵਿਸ਼ਿਆਂ ਉੱਤੇ) : 10 ਲੇਖ ਲਿਖਵਾਉਣੇ
(ਕਲਾਸ ਵਿਚ ਅਤੇ ਘਰ ਲਈ ਅਭਿਆਸ)

ਸੈਕਸ਼ਨ-ਸੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰੋਂ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ)   ਨੰਦ ਲਾਲ ਨੂਰਪੁਰੀ
(ਅ)   ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ
(ੲ)   ਡਾ. ਹਰਿਭਜਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਸ਼ੁੱਧ, ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ
(15 ਪੈਰ੍ਹਿਆਂ ਦੇ ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ ਅਭਿਆਸ ਕਰਵਾਉਣੇ)

ਸੈਕਸ਼ਨ-ਡੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰੋਂ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ)   ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ
(ਅ)   ਸੁਰਜੀਤ ਪਾਤਰ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)

II. ਅਖ਼ਬਾਰੀ ਇਸ਼ਤਿਹਾਰ : ਨਿੱਜੀ, ਦਫ਼ਤਰੀ ਤੇ ਸਮਾਜਕ ਗਤੀਵਿਧੀਆਂ ਨਾਲ ਸੰਬੰਧਤ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

(ELECTIVES)

HSL–101: Punjab History & Culture (1450-1716)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0
Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A
1. Land and the People.
2. Bhakti Movement
Section-B
3. Life and Teaching of Guru Nanak Dev.
4. Contribution of Guru Angad Dev, Guru Arjun Dev, Guru Amar Das and Guru Ram Das.
Section-C
5. Guru Hargobind.
6. Martyrdom of Guru Teg Bahadur
Section-D
7. Guru Gobind Singh and the Khalsa.
8. Banda Singh Bahadur: Conquests and Execution.

Suggested Reading:
1. Kirpal Singh (Ed.), *History and Culture of the Punjab, Part-ii, Punjabi University,* Patiala, 1990.
2. Fauja Singh (Ed.), *History of Punjab, Vol, III Punjabi University, Patiala, 1987.*
3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*
4. Khushwant Singh, *A History of the Sikhs,* Vol. I, OUP, New Delhi, 1990.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

(ELECTIVES)

PBL-122: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

Credits: 2-0-0
Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਏ

ਪੈਂਤੀ ਅੱਖਰੀ, ਅੱਖਰ ਕ੍ਰਮ,
ਮਾਤ੍ਰਾਵਾਂ (ਮੁਢਲੀ ਜਾਣ-ਪਛਾਣ)
ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਤੇ ਵਰਤੋਂ

ਸੈਕਸ਼ਨ-ਬੀ

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ
ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ
ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ

ਸੈਕਸ਼ਨ-ਸੀ

ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ।
ਸਮਾਨਾਰਥਕ ਤੇ ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ

ਸੈਕਸ਼ਨ-ਡੀ

ਹਫਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਮ, ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿੱਚ।

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ।
   ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(COMPULSARY ID COURSE)
(Student can opt this Paper in 1st or 2nd Semester)

SOA: 101–PROBLEM OF DRUG ABUSE

Time: 3 Hours   **Credit 3-0-0**
                                                                    Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section – A
Meaning of Drug Abuse:
 (i) Meaning, Nature and Extent of Drug Abuse in India and Punjab.
 (ii) Consequences of Drug Abuse for:
     Individual   :   Education, Employment, Income.
     Family   :   Violence.
     Society   :   Crime.
     Nation   :   Law and Order problem.

Section – B
Management of Drug Abuse:
 (i)   Medical Management: Medication for treatment and to reduce withdrawal effects.
 (ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
 (iii) Social Management: Family, Group therapy and Environmental Intervention.

Section – C
Prevention of Drug Abuse:
 (i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
 (ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

Section – D
Controlling Drug Abuse:
 (i) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
 (ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–I
(Credit Based Evaluation and Grading System)

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.

2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.

3. Inciardi, J.A. 1981. *The Drug Crime Connection.* Beverly Hills: Sage Publications.

4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.

5. Kessel, Neil and Henry Walton. 1982, *Alcohalism. Harmond Worth:* Penguin Books.

6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.

7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.

8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society.* New Delhi: Sage Publications.

9. Sain, Bhim 1991, *Drug Addiction Alcoholism,* Smoking obscenity New Delhi: Mittal Publications.

10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.

11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.

12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,* Cambridge University Press.

13. Verma, P.S. 2017, "*Punjab's Drug Problem: Contours and Characterstics",* Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.

14. World Drug Report 2016, United Nations office of Drug and Crime.

15. World Drug Report 2017, United Nations office of Drug and Crime.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

Course Name	:	**Engineering Chemistry**
Course Code	:	**CYL-197**
Credits (L-T-P)	:	**4 (3-0-1)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Internal Marks: 20	**External Marks: 80**

Course Objectives:
At the end of this course, the student should be able to understand the water quality requirement for human consumption, different treatment process for municipal water treatment, application of glass, ceramics, composites, magnetic materials, Role of refractories for synthesis of high performance materials. Polymer, rubber and silicone material uses in daily life. Introduction to electrochemistry. Application of CNT and graphene in electronics industry.

Total No. of Lectures –45

Lecture wise breakup	**Number of lectures**
Note: Eight questions are to be set by selecting two questions from each section. Each question is divided in subsections (not exceeding 4). The candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.	
SECTION - A	
1 **Water hardness:** Common impurities of water, Hardness: Introduction, EDTA method for determination of hardness, degree of hardness. Numerical based on hardness and EDTA method.	3
2 **Water hardness related problems:** Boiler troubles, their causes, disadvantages and prevention: Formation of solids (scale and sludge), carry over (priming and foaming), corrosion and caustic embrittlement.	2
3 **Water treatment techniques**: Introduction, water purification techniques, steps involved in purification of water, sedimentation, coagulation, filtration and sterilization, chlorination.	2
4 **Softening of water:** Lime-Soda method, Zeolite method, Deionization/Demin-eralization methods. Numerical problems based on Lime-Soda and Zeolite softening methods.	2

	SECTION - B	
5	**Glasses, Ceramics, Composites** Glassy state, glass formers and modifiers, types of glasses, manufacturing, applications. Ceramic structures, types of ceramics and their properties. Composites; types, properties and applications.	3
6	**Magnetic Materials:** Introduction, types of magnetic material, hard and soft ferrites, magnetic properties and applications.	3
7	**Refractories:** Definition, classification, properties, requisites of good refractory, manufacturing of refractory, silica and fire clay refractory and their uses. Seger's (Pyrometric) Cone Test and RUL Test.	3
	SECTION - C	
8	**Polymers:** Introduction, classification and constituents of polymers, polymer structure and properties, glass transition temperature (T_g), melting point (T_m), structure-property relations (general), synthesis, properties and application of commercial polymers (Bakelite, Polyethylene, Polypropylene, Polystyrene, Polycarbonate, Polytetra fluoroethylene, Polyester and Nylon)	3
9	**Polymer processing methods**: Introduction, compounding, moulding (Injection, Compression, Blow film and Extrusion). Application of polymers such as contact lenses, bulletproof vest, etc.	3
10	**Rubber:** Introduction, natural rubber, vulcanization, different types of rubber, synthesis of rubbers viz. Buna-S, Buna-N, Buty1 and neoprene rubbers, properties and application.	3
	SECTION - D	
12	**Silicone based compounds:** Introduction, properties, preparation of silicones, cross-linked silicones, silicon fluids or oils, silicon elastomers and their applications.	2
13	**Electrochemistry:** Introduction, Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, Arrhenius theory of ionization, specific conductance, molar conductance, Faraday's Law of electrolysis, Chemical cells, distinguish between electrolytic and galvanic cell, reversible and irreversible cells with examples. Standard electrode (reduction) potential of half-cells. Applications of electrochemistry in daily life.	4
14	**Nanomaterial:** Introduction, properties, general methods of preparation. Applications of fullerenes, CNTs and graphene.	3

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

List of Practical's:

1. Determination of total hardness of Water.

2. Determination of temporary and permanent hardness of water.

3. To determine the strength of sodium carbonate in given sample of washing soda.

4. To determine the strength of sodium carbonate and sodium hydroxide in caustic soda solution.

5. To determine the strength of acetic acid in vinegar

6. Find the strength of KMnO4 solution with oxalic acid

7. Find the strength of KMnO4 solution with Mohr's salt.

8. To determine the number of water molecules in Mohr's salt by titration method.

9. Determination of relative viscosity of a given liquid with respect to water by viscometer.

10. Determination of surface tension of a given liquid by drop number method by stalagmometer.

11. To determine the strength of strong and weak acid conductometry

12. To determine the critical micelle concentration of a soap (sodium laurate) by surfacetension measurements.

Course Outcomes:	
1	Develop new methods to produce soft water for industrial use and potable water at low cost.
2	Replace metals with polymer in different application areas.
3	Develop low cost and new methods for synthesis of Nano materials.
4	Apply their knowledge for development of new application of electrochemistry.
5	Demonstrate the knowledge of polymer materials for advance engineering applications.

Suggested / Reference Books:	
1	Engineering Chemistry by P.C. Jain & Monica Jain DhanpatRai Publishers, NewDelhi.2014.
2	Physical Chemistry by A. Peter and J.de. Paula 10th Edition Oxford University Press, 2014.
3	Inorganic Polymers by P.B. Saxena, Discovery Publishing House, 2007.
4	Ferrite materials by V.R.K. Murthy & B. Viswanathan, SpringerVerlag, Berlin, 1990
5	Advanced practical physical chemistry by J.B Yadav by Krishna's educational publishers.

E-learning resource: https://nptel.ac.in/courses.php

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

Course Name	:	**Mathematics-II**
Course Code	:	**MTL-102**
Credits (L-T-P)	:	**4 (3-1-0)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
The aim of the course is to enlighten the students with engineering mathematics which they would need to implement in their respective engineering branches. This course would prepare the students for implementation of these concepts in future applications and help them trouble shoot the problems associated with their respective disciplines.

Total No. of Lectures – 45

	Lecture wise breakup	Number of Lectures
	SECTION - A	
1	**Fourier Series:** Euler's formula, Conditions for a Fourier expansion, Functions having points of discontinuity, Change of interval, Odd and even periodic functions, Expansion of odd and even periodic functions, Half-range series	10
	SECTION - B	
2	**Ordinary Differential Equations :** Exact equations, Equations reducible to exact equations, Linear differential equations with constant co-efficients, Complimentary functions and particular integral, Method of variation of parameters, Equations reducible to linear equations with constant co-efficients (Cauchy's and Legendre's linear equations).	12
	SECTION - C	
3	**Complex Analysis:** De Moivre's theorem with applications, Analytic functions, Cauchy-Riemann equations, Harmonic functions, Cauchy's integral theorem, Cauchy's integral formula (without proofs), Taylor series and Laurent series (without proofs) Residues and Residue theorem.	10

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

	SECTION - D	
4	**Integral Transforms:** Laplace Transforms of standard functions and their properties, Inverse Laplace Transforms, General Properties of inverse Laplace transforms and Convolution Theorem, Fourier transforms, Finite Fourier Sine and Cosine Transforms, modulation theorem, shifting properties, Convolution theorem.	13

Course Outcomes:	
1	The students will be able to classify differential equations according to certain features.
2	The tool of Fourier series and Laplace Transforms for learning advanced Engineering Mathematics.
3	The students will learn the mathematical tools needed in evaluating complex analysis and their usage.

Suggested / Reference Books:	
1	Kreyszig: Engineering Mathematics, Wiley Eastern Ltd.
2	B.S. Grewal: Higher Engineering Mathematics, Khanna Publisher, New Delhi.
3	Louis A. Pipes: Applied Mathematics for Engineers and Physicists, McGraw Hill Book Company.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

Course Name	:	**Basic Electrical & Electronics Engineering**
Course Code	:	**ECL-119**
Credits (L-T-P)	:	**5 (4-0-1)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Internal Marks: 20	External Marks: 80

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
This course is aimed to introduce important initial understanding of electrical and electronics engineering to the 1st year students, this will act as the foundation for the advanced electronics courses. The aim of this course is to familiarize the students to the basics of electricity, electrical machines and the basics of electronic devices. so that they can use this knowledge in relevant applications.

Total No. of Lectures –48

Lecture wise breakup	**Number of Lectures**
Note: Eight questions are to be set by selecting two questions from each section. Each question is divided in subsections (not exceeding 4). The candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.	
SECTION – A	
1 **Electricity and power supply**: Features of the power supply system, power station, transmission, distribution lines, difference between AC and DC, voltage, current and resistance, concept of electromagnetic induction and production of alternating e.m.f - single phase and 3 phase, 3-phase star and delta connections, voltage and current relations. **Electrical Machinery:** Transformer, its working principle, types of transformers and their applications, performance losses, efficiency and voltage regulation, open circuit and short circuit tests on transformer, auto transformers.	12

SECTION – B		
2	**Circuit Analysis**: A brief review of DC and single phase AC circuits. , Star-delta load transformation, concept of balanced and unbalanced three phase circuits, measurement of power and power factor in three phase balanced circuits. **Semiconductors:** Introduction to semiconductors, Intrinsic Semiconductor, n-type and p-type semiconductors, Effect of Doping, Fermi levels, Charge flow in semiconductors.	12
SECTION – C		
3	**PN junction diode**: Theory of PN junction diode, depletion layer, barrier potential, Volt-Ampere Characteristics, Current Components, Storage Capacitance and transition capacitance, Junction diode switching times, Zener diode, LED, Photodiode, Varactor diode, Schottky diode **Bipolar Junction Transistors**: Junction Transistor, Current components, transistor as an amplifier, CB, CE and CC configurations and characteristics.	12
SECTION – D		
4	**Fundamentals of DC & AC Motors:** Working principle, construction, types & characteristics of DC motor, Working principle of Single-Phase & Three-Phase Induction motor, Three phase synchronous motor. **Control and Protection**: Control mechanism, principle and applications of protection devices: Fuses, MCB, LCB, relays. Need& types of earthing and grounding, Cables, Construction of LT & HT cables.	12

Course Outcomes: After study of this subject the student will become	
1	Familiar with the electricity production, distribution and the use of control/protection devices.
2	Able to understand the working and applications of electrical machines.
3	Able to understand the basics of semiconductor devices and their applications.
4	Familiar to the concept of rectification and filtration circuits.
5	Able to analyze the basic DC and AC circuits and to solve related circuit problems.

	Suggested / Reference Books:
1	Principles of Electrical Engineering by Gupta BR; S. Chand and Company, New Delhi.
2	Electrical Technology by Hughes Edward; The English Language Book Society and Longmans.
3	Electrical Machines by Bhattacharya SK; Tata McGraw Hill, Delhi.
4	Basic Electrical Engineering by T.K. Naggarkar& Ms. Sakhija Seventh Edition 2008, Oxford University Press.
5	Electronic Devices and Circuit Theory, Boylestad R.L. VIII Edition, Pearson Education, 2008.
6	Electronic Fundamentals & Application, J.D. Ryder, PHI, 2006.
7	Experiments in Electrical Engineering by Bhatnagar US; Asia Publishing House, Bombay.

PRACTICAL:

1. Study of VI characteristics of PN junction

2. Study of Half wave, full wave & Bridge rectifiers.

3. Study of simple capacitive, T & II filters.

4. Study of zener as a voltage regulator.

5. Study of transistor characteristics in CC, CB and CE configuration

6. To study the performance characteristic of clipper circuit

7. To study the performance characteristic of clamper circuit

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

Course Name	:	**Fundamentals of Information technology and programming using python**
Course Code	:	**CSL 126**
Credits (L-T-P)	:	**4 (2-1-1)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Internal Marks: 20	**External Marks: 80**

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
At the end of this course, the student should be able to understand the basics of computer as well as programming. The students are able to write programs. This course introduces computer programming using the Python programming language. Emphasis is placed on common algorithms and programming principles utilizing the standard library with Python.

Total No. of Lectures –40

Lecture wise breakup	**Number of Lectures**
Note: Eight questions are to be set by selecting two questions from each section. Each question is divided in subsections (not exceeding 4). The candidates are required to attempt five questions by selecting one question from each section and the fifth question can be attempted from any section. All questions carry equal marks.	
SECTION - A	
1 Block diagram of Computer, Associated peripherals, Memories – RAM, ROM, Secondary Storage Devices, Classification of Computers and Languages, Introduction to Compilers, Interpreter and Assemblers, Introduction of various operating system with their file system.	10
SECTION - B	
2 Algorithm and Flowchart, Introduction to Python and Setting up the Python development environment, Basic syntax, interactive shell, editing, saving, and running a script, Concept of data types, Random number, Real numbers, immutable variables, Python console Input / Output. Arithmetic operators and expressions, Conditions, Comparison operators, Logical Operators, Is and In operators, Control statements: if-else, Nested If-Else, Loops (for, while)	10

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

	SECTION - C	
3	Built in function and modules in python, user defined functions, passing parameters, arguments and return values; formal vs actual arguments, Recursion, lists, Common List operations	10
	SECTION - D	
4	String Handling, Unicode strings, Strings Manipulation:-compare strings, concatenation of strings, Slicing strings in python, converting strings to numbers and vice versa. Strings and text files; manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab-separated).	10

Course Outcomes:	
1	Implement a given algorithm as a computer program in python language with the understanding of hardware components and memory utilization.
2	Able to use standard programming constructs: repetition, selection, functions, composition, modules and different data types
3	Adapt and combine standard algorithms to solve a given problem (includes numerical as well as non-numerical algorithms) and to debug the program written in python language

Suggested / Reference Books:	
1	Computers Today by Sanders.
2	Fundamentals of Computers TTTI Publication.
3	Learning Python by Mark Lutz, 5th edition
4	Python cookbook, by David Beazley , 3rd Edition
5	Python Essential Reference, by David Beazley , 4th edition
6.	Python in a Nutshell, by Alex Mortelli, 2nd Edition.
7	Python programming: An Introduction to computer science, by John Zelle, 2nd Edition.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

ENL-101: COMMUNICATIVE ENGLISH

Credits: 02 (L= 2, T=0, U=0)
Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Prescribed Text Books:
- *The Written Word* by Vandana R. Singh, Oxford University Press, New Delhi.
- *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

Section–A
"Word List", "Correct Usage of Commonly used words and Phrases" from the chapter "Vocabulary" given in *The Written Word* by Vandana R. Singh.

Section–B
Letter- writing as prescribed in *The Written Word* by Vandana R. Singh.
Report writing as prescribed in *The Written Word* by Vandana R. Singh.

Section–C
Section 1 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

Section–D
Section 2 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

Course Name	:	**Workshop Practices**
Course Code	:	**MEP-101**
Credits (L-T-P)	:	**2 (0-0-2)**
Total Marks	:	**100**
Mid Semester Examination	:	**20% weightage**
End Semester Examination	:	**80% weightage**

Internal Marks: 20	External Marks: 80

Course Objectives:
At the end of this course, the student should be able to understand the 1. Understand applications of hand tools and power tools. 2. Understand the operations of machine tools. 3. Select the appropriate tools required for specific operation. 4. Comprehend the safety measures required to be taken while using the tools.

Total No. of Practicals – 24

	Lecture wise breakup	**Number of Practicals**
	SECTION - A	
1	Carpentry Shop: (a) Study of tools & operations and carpentry joints. (b) Simple exercise using jackplane. (c) To prepare half-lap corner joint, mortise & tennon joints. (d) Simple exercise on wood working lathe.	3
2	Fitting (Bench Working) Shop: (a) Study of tools & operations (b) Simple exercises involving fitting work. (c) Make perfect male-female joint. (d) Simple exercises involving drilling / tapping / dieing.	3
	SECTION - B	
3	Black Smithy Shop: (a) Study of tools & operations (b) Simple exercises based on black smithy operations such as upsetting, drawing down, punching, bending, fullering & swaging.	3

4	Welding Shop: (a) Study of tools & operations of Gas welding & Arc welding. (b) Simple butt and Lap welded joints. (c) Oxy-acetylene flame cutting.	3
	SECTION - C	
5	Sheet-metal Shop: (a) Study of tools & operations. (b) Making Funnel complete with soldering. (c) Fabrication of tool-box, tray, electric panel box etc.	3
6	Machine Shop: (a) Study of Single point cutting tool, machine tools and operations. (b) Plane turning. (c) Step turning. (d) Taper turning. (e) Threading.	3
	SECTION - D	
7	Foundry Shop: (a) Study of tools & operations (b) Pattern making. (c) Mould making with the use of a core. (d) Casting	3
8	Electrical and Electronics Shop: Study of tools & operations	3

Course Outcomes:	
1	To acquire skills in basic engineering practice, measuring skills and practical skills in the trades.
2	To provides the knowledge of job materials in various shops.
3	To identify the hand tools and instruments.
4	To provides the knowledge of core technical subjects for making and working ofany type of project.
5	Understand modern manufacturing operations, including their capabilities, limitations, and how to design economically.
6	Gain insight into how designers influence manufacturing schedule and cost, and cost of different components.
7	Learn how to analyze products and be able to improve their manufacturability and make the cost effectively.
Suggested / Reference Books:	
1	Lab Manual to be provided by Department of Mechanical Engineering
2	Work shop technology by Hajraand Chaudhary
3	Work shop technology by Chapmen

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

(ELECTIVES)

PBL 131: ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ–II

Credit: 2-0-0
Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਸੈਕਸ਼ਨ-ਏ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ)   ਨਾਨਕ ਸਿੰਘ : **ਭੂਆ**
(ਅ)   ਗੁਰਮੁਖ ਸਿੰਘ ਮੁਸਾਫ਼ਿਰ : **ਬਾਗੀ ਦੀ ਧੀ**
(ੲ)   ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ : **ਪੇਮੀ ਦੇ ਨਿਆਣੇ**
                     (ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
II.   ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ/ਮੂਲ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਵਿਉਤਪਤ ਅਤੇ ਰੁਪਾਂਤਰੀ), ਸਮਾਸ।

ਸੈਕਸ਼ਨ-ਬੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ)   ਸੁਜਾਨ ਸਿੰਘ : **ਬਾਗਾਂ ਦਾ ਰਾਖਾ**
(ਅ)   ਕਰਤਾਰ ਸਿੰਘ ਦੁੱਗਲ : **ਤੈਂ ਕੀ ਦਰਦ ਨਾ ਆਇਆ**
                     (ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
II.   ਪੈਰ੍ਹਾ ਰਚਨਾ : ਕਲਾਸ ਵਿਚ 10 ਵਿਸ਼ਿਆਂ (ਸਭਿਆਚਾਰ, ਧਾਰਮਕ ਅਤੇ ਰਾਜਨੀਤਕ) 'ਤੇ ਪੈਰ੍ਹਾ ਰਚਨਾ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ।

ਸੈਕਸ਼ਨ-ਸੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ)   ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ : **ਧਰਤੀ ਹੇਠਲਾ ਬੌਲਦ**
(ਅ)   ਨਵਤੇਜ ਸਿੰਘ : **ਦੂਜੀ ਵਾਰ ਜੇਬ ਕੱਟੀ ਗਈ**
(ੲ)   ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ : **ਲੱਛਮੀ**
                     (ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
II.   ਮੁਹਾਵਰੇ ਤੇ ਅਖਾਣ (ਅਖਾਣ ਤੇ ਮੁਹਾਵਰਾ ਕੋਸ਼ ਵਿਚ) 200 ਮੁਹਾਵਰਿਆਂ ਅਤੇ 100 ਅਖਾਣਾਂ ਨੂੰ ਵਾਕਾਂ ਵਿਚ ਵਰਤਣ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ (ਕਲਾਸ ਵਿਚ ਤੇ ਘਰ ਲਈ)।

ਸੈਕਸ਼ਨ-ਡੀ

I. **ਦੋ ਰੰਗ** (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ)   ਅਜੀਤ ਕੌਰ : **ਬੁੱਤ ਸ਼ਿਕਨ**
(ਅ)   ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ : **ਬੱਸ ਕੰਡਕਟਰ**
                     (ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
II.   ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸੰਬੰਧਕ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1.   ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2.   ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3.   ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4.   ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

(ELECTIVES)

HSL–102: Punjab History & Culture (1717-1947)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Credits: 2-0-0
Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A
1. Sikh Struggle for Sovereignty.
2. Ranjit Singh: Conquests, Administration and the Anglo-Sikh Relations.
Section-B
3. Anglo-Sikh Wars and the Annexation.
4. The Punjab under the British: New Administration, Education and social Change.
Section-C
5. Economic Changes: Agricultural
6. Socio-Religious Reform Movements.
Section-D
7. Role of Punjab in the Freedom Struggle.
8. Fairs and Festivals.

Suggested Readings:

1. Kirpal Singh (Ed.), *History and Culture of the Punjab,* Part-II, Punjabi University, Patiala, 1990.

2. Fauja Singh (Ed.), *History of Punjab,* Vol, III, Punjabi University, Patiala, 1987.

3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*

4. Khushwant Singh, *A History of the Sikhs,* Vol. I, OUP, New Delhi, 1990.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

(ELECTIVES)

PBL-132: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)

Credits: 2-0-0
Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਪਾਠ–ਕ੍ਰਮ

ਸੈਕਸ਼ਨ–ਏ

ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਪਛਾਣ ਅਤ ਵਰਤ

(ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਾਰਾਆ ਵਿਸ਼ੇਸ਼ਣ)

ਸੈਕਸ਼ਨ–ਬੀ

ਨਿਤ ਵਰਤ ਦਾ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲਾ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤ-ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਨਾਲ ਸਬੰਧਤ ।

ਸੈਕਸ਼ਨ–ਸੀ

ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ

ਸਾਧਾਰਨ-ਵਾਕ (ਪਛਾਣ ਅਤ ਵਰਤ)

ਸੰਯੁਕਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਮਿਸ਼ਰਤ-ਵਾਕ (ਪਛਾਣ ਅਤ ਵਰਤੋਂ)

ਸੈਕਸ਼ਨ–ਡੀ

ਪਰ੍ਹਾ ਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ।ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(COMPULSARY ID COURSE)
(Student can opt this Paper in 1ˢᵗ or 2ⁿᵈ Semester)

SOA–101: PROBLEM OF DRUG ABUSE

Time: 3 Hours   **Credit 3-0-0**
                                                                        Marks: 100

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section – A

Meaning of Drug Abuse:
  i.   Meaning, Nature and Extent of Drug Abuse in India and Punjab.
  ii. Consequences of Drug Abuse for:
       Individual   :   Education, Employment, Income.
       Family   :   Violence.
       Society   :   Crime.
       Nation   :   Law and Order problem.

Section – B

Management of Drug Abuse:
  i.   Medical Management: Medication for treatment and to reduce withdrawal effects.
  ii. Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
  iii. Social Management: Family, Group therapy and Environmental Intervention.

Section – C

Prevention of Drug Abuse:
  i.   Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
  ii. School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

Section – D

Controlling Drug Abuse:
  i.   Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
  ii. Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–II
(Credit Based Evaluation and Grading System)

(ELECTIVES)

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.

2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.

3. Inciardi, J.A. 1981. *The Drug Crime Connection.* Beverly Hills: Sage Publications.

4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.

5. Kessel, Neil and Henry Walton. 1982, *Alcohalism. Harmond Worth:* Penguin Books.

6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.

7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.

8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society.* New Delhi: Sage Publications.

9. Sain, Bhim 1991, *Drug Addiction Alcoholism,* Smoking obscenity New Delhi: Mittal Publications.

10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.

11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.

12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,* Cambridge University Press.

13. Verma, P.S. 2017, "*Punjab's Drug Problem: Contours and Characterstics",* Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.

14. World Drug Report 2016, United Nations office of Drug and Crime.

15. World Drug Report 2017, United Nations office of Drug and Crime.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–III
(Credit Based Evaluation and Grading System)

CSL–231: DATA STRUCTURES & PROGRAMMING METHODOLOGY

Internal Marks:	20	CREDITS
External Marks:	80	L T P
		3 1 0

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Theory:

SECTION-A

Introduction: About data structure, Data structure operations, Algorithm: Def., Complexity, Time-space tradeoff, Algorithmic notations, Big O notation.

Arrays: Linear array, Representation of Linear array in memory, Traversing linear array, Inserting, Deleting, Sorting (Bubble sort), Searching (Linear search, Binary search).

SECTION-B

Stacks: Introduction, operations, Arithmetic expression, Polish notations, Transforming infix to postfix, Quick sort, Recursion concept, Tower of Hanoi.

Queues: Define Queues, Operations, Dequeues, Priority Queues.

SECTION-C

String Processing: Introduction, Basic terminology, Storing strings, String operations, Word processing.
Linked List: Representation in memory, Traversing, Searching, Insertion, deletion, Header Linked List, Two ways List: operations.

SECTION-D

Trees: Binary trees, Representation in memory, Traversing, Traversal algorithms using stacks, Binary Search trees: Searching, Inserting and Deleting. Heap and Heap sort.

Graphs: Graph Theory Terminology, Sequential Representation, Warshall's Algorithm, Linked Representation, Traversing a graph, Hashing.

Texts / References:

1. Seymour Lipschutz : Theory and Problems of Data Structures, Schaum's Outline Series

2. Aho A. V. J. E. Hopcroft, J.D. Ullman; Data Structures and Algorithms, Addison–Wesley, 1983.

3. Baase, S Computer Algorithms; Introduction to Design and Analysis, Addison – Wesley, 1978.

4. Berztiss, A. T.: Data Structures, Theory and practice: 2nd ed., Academic Press, 1977.

5. Collins, W.J. Data Structures, An Object–Oriented Approach, Addison – Wesley, 1992.

6. Goodman, S.E., S.T.Hedetniemi: Introduction to the Design and Analysis of Algorithms, McGraw Hill, 1977.

7. Horowitz, E.S. Sahni: Algorithms: Design and Analysis, Computer Science Press, 1977.

8. Kunth, D.E. The Art of Computer Programming. Vols. 1–3, Addison – Wesley, 1973.

9. Kurse, R.L. Data Structures and Program Design, 2nd Ed., Prentice Hall, 1987.

10. Lorin, H.: Sorting and Sort Systems, Addison – Wesley, 1975.

11. Standish, T.A.: Data Structure Techniques, Addison – Wesley, 1980.

12. Tremblay, J.P., P.G. Sorenson: An Introduction to Data Structures with Applications, McGraw Hill, 1976.

13. Wirth, N.: Algorithms + Data Structures = Programs, Prentice Hall, 1976.

CSL–233: PROGRAMMING IN C++

Internal Marks: 20   CREDITS
External Marks: 80   L   T   P
                                                                   2   1   1

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Theory:

SECTION–A
Difference between C, C++ and VC++. Brief introduction to data types, operators and control statements in C++. Advanced preprocessor statements, Features of C++, I/O statements in C++, Manipulators, Arrays and Strings.

SECTION–B
Classes and Objects; Access Specifiers, Function Overloading, Inline Functions, Friend Functions and Friend Class. Constructors & Destructors: Types of Constructors.

SECTION–C
Inheritance, Types of Inheritance, Ambiguity in Inheritance. Polymorphism: Virtual Functions, Pure virtual Functions, Operator Overloading.

SECTION–D
Pointers, Array of pointers. Dynamic memory allocation in C++.File handling in C++, Templates and Exception Handling.

PROGRAMMING LANGUAGES LAB:

Students should be asked to write programs in C++ using different statements, Libraries and Functions, Designing Unique Manipulators for the development of program in all areas of data structures covered in the course. Emphasis should be given on development of recursive as well as non recursive algorithms involving arrays, string handling, stacks and queues, linked list trees and graphs. Use of pointers for dynamic memory allocation.

Books:
1. Object Oriented programming in C++ – Robert Lafore
2. Programming ANSI and TURBO C++ – Kamdhane
3. Let Us C++ – Yashwant Kanetkar.
4. The C++ Programming Language – BjarneStroustrup

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–III
(Credit Based Evaluation and Grading System)

ESL–220: ENVIRONMENTAL STUDIES
(Compulsory ID Course)

Credits: 4-0-0

Teaching Methodologies:
The Core Module Syllabus for Environmental Studies includes class room teaching and field work. The syllabus is divided into 8 Units [Unit-1 to Unit-VII] covering 45 lectures + 5 hours for field work [Unit-VIII]. The first 7 Units will cover 45 lectures which are class room based to enhance knowledge skills and attitude to environment. Unit-VIII comprises of 5 hours field work to be submitted by each candidate to the Teacher in-charge for evaluation latest by 15 December, 2019.

Exam Pattern: **End Semester Examination- 75 marks**
                                  Project Report/Field Study- 25 marks [based on submitted report]
                                  Total Marks- 100

The structure of the question paper being:

Part-A, Short answer pattern with inbuilt choice   – **25 marks**
Attempt any five questions out of seven distributed equally from Unit-1 to Unit-VII.
Each question carries 5 marks. Answer to each question should not exceed 2 pages.

Part-B, Essay type with inbuilt choice   – **50 marks**
Attempt any five questions out of eight distributed equally from Unit-1 to Unit-VII. Each question carries 10 marks. Answer to each question should not exceed 5 pages.

Project Report / Internal Assessment:

Part-C, Field work – **25 marks [Field work equal to 5 lecture hours]**
The candidate will submit a hand written field work report showing photographs, sketches, observations, perspective of any topic related to Environment or Ecosystem. The exhaustive list for project report/area of study are given just for reference:

1. Visit to a local area to document environmental assets: River / Forest/ Grassland / Hill / Mountain / Water body / Pond / Lake / Solid Waste Disposal / Water Treatment Plant / Wastewater Treatment Facility etc.
2. Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
3. Study of common plants, insects, birds
4. Study of tree in your areas with their botanical names and soil types
5. Study of birds and their nesting habits
6. Study of local pond in terms of wastewater inflow and water quality
7. Study of industrial units in your area. Name of industry, type of industry, Size (Large, Medium or small scale)
8. Study of common disease in the village and basic data from community health centre
9. Adopt any five young plants and photograph its growth
10. Analyze the Total dissolved solids of ground water samples in your area.
11. Study of Particulate Matter ($PM_{2.5}$ or PM_{10}) data from Sameer website. Download from Play store.
12. Perspective on any field on Environmental Studies with secondary data taken from Central Pollution Control Board, State Pollution Control Board, State Science & Technology Council etc.

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(Credit Based Evaluation and Grading System)

Unit-I
The multidisciplinary nature of environmental studies
Definition, scope and importance, Need for public awareness

(2 lectures)

Unit-II
Natural Resources: Renewable and non-renewable Resources:
Natural resources and associated problems.
(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

(8 Lectures)

Unit-III
Ecosystems:
- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

(6 Lectures)

Unit-IV
Biodiversity and its conservation:
- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
- 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 and Ex-situ conservation of biodiversity

(8 Lectures)

Unit-V

Environmental Pollution:
Definition:
- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

(8 Lectures)

Unit-VI

Social Issues and the Environment
- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

(7 Lectures)

Unit-VII

Human Population and the Environment
- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education

- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

(6 Lectures)

Unit-VIII

Field Work
- Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc

(Field work equal to 5 lecture hours)

References:

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.

2. Down to Earth, Centre for Science and Environment, New Delhi.

3. Heywood, V.H. & Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.

4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.

5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.

6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.

7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.

8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut.

9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi

10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi.

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(Credit Based Evaluation and Grading System)

ECL–291: DIGITAL CIRCUITS AND LOGIC DESIGN

Internal Marks: 20   CREDITS
External Marks: 80   L   T   P
                                                           3   0   1

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Theory:
SECTION-A
Data and number representation–binary, Octal, Hexadecimal (conversions, addition & subtraction) complements, BCD, ASCII, Excess-3 code, Gray codes, logic gates, Boolean Algebra.
SECTION-B
Minimization of logic functions.Sum of Products (SOP), Product of Sums (POS), minterm, maxterm. Digital Circuit Technologies: RTL / DTL / DCTL / TTL / MOS / CMOS / ECL, analysis of basic circuits in these families. Comparison of logic families.

SECTION-C
Combinational circuit design, Adder, Subtractor, Encoder, Decoder, Multiplexer, Demultiplexer.
Sequential circuits: flip–flops, counters, shift registers, State diagram for sequential circuits.
SECTION-D
A/D and D/A conversion techniques. Memory system – RAM, ROM, EPROM, EEPROM, PLDs, PAL, PLA, PGAs. Introduction to VLSI Design.

Practicals:
- Realization of selected circuits using TTL and MOS components.
- Familiarization with CAD design tools.
- Design exercises using EPLDs and FPGAs.
- Compare two six bit numbers and display the larger number on seven segment display.
- Design a mod – 7 counter. Generate a pulse for every 1 ms.
- Use 2 to 1 Mux and implement 4 to 1 Mux.
- Pattern recognizer.
- 4 bit ALU.
- Serial to parallel shifter and parallel to serial shifter.
- Priority resolver.
- Binary to gray code converter.
- Traffic light controller.
- Pattern Generator.

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(Credit Based Evaluation and Grading System)

Texts / References:

1. Morris Mano, Digital Design– Prentice Hall of India Pvt. Ltd., New Delhi, 1992.

2. Jesse H.Jenkins, Designing with FPGAs and CPLDs, PTR Prentice Hall, Englewood Cliffs, New Jersy, 1994.

3. H.Taub& D. Schilling, Digital Integrated Electronics. McGraw Hill, 1977.

4. Douglas L. Perry, VHDL, McGraw Hill, Inc. 2nd Edition, 1993.

5. Mead and L. Conway, Introduction to VLSI Systems, Addition Wesley, 1979.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–III
(Credit Based Evaluation and Grading System)

ENL–201: WRITTEN & ORAL TECHNICAL COMMUNICATION
(Communication Skills for Scientists and Engineers)

Internal Marks: 20	CREDITS
External Marks: 80	L T P
	2 1 1

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Note taking from lectures and reference material	[10%]
Essay and precis writing	[30%]
Slide preparation and oral presentation principles	[10%]
Written presentation of technical material	[20%]
Preparation of Bibliography	[10%]
Basics of Official Correspondence	[15%]
Preparation of bio–data	[5%]

Students should be asked to prepare and present Seminars during the practice session.

Texts / References:
1. The Chicago Manual of Style, 13th Edition, Prentice Hall of India 1989.
2. Gowers Ernest, "The Complete Plan in Words" Penguin, 1973.
3. Menzel D.H., Jones H.M., Boyd, LG., "Writing a Technical Paper", McGraw Hill, 1961.
4. Strunk, W., & White E.B., "The Elements of Style:, 3rd Edition, McMillan, 1979.
5. Turbian K.L., "A Manual for Writers of Term Papers, Thesis and Dissertations" Univ. of Chicago Press, 1973.
6. IEEE Transactions on "Written and Oral Communication" has many papers.

Practical:
Students should be asked to prepare Technical Presentation on the emerging areas of Information Technology and present the same to the group of Students.

Texts / References:
1. The Chicago Manual of Style, 13th Edition, Prentice Hall of India, 1989.
2. Gowers Ernest, "The Complete Plan in Words" Penguin, 1973.
3. Menzel D.H., Jones H.M., Boyd, LG., "Writing a Technical Paper", McGraw Hill, 1961.
4. Strunk, W., & White E.B., "The Elements of Style:, 3rdEdition, McMillan, 1979.
5. Turbian K.L., "A Manual for Writers of Term Papers, Thesis and dissertations" Univ. f
   Chicago Press, 1973. IEEE Transactions on "Written and Oral Communication" has many papers

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–IV
(Credit Based Evaluation and Grading System)

CSL–240: OPERATING SYSTEM

		CREDITS
Internal Marks:	20	
External Marks:	80	L T P
		2 1 1

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A
Introduction to Operating Systems, Main Functions and characteristics of Operating Systems, Types of Operating Systems, System Calls

Process Management: Process States, Process Control Block, Process Scheduling, CPU Scheduling.

SECTION-B
Resource allocation graph, Deadlocks: Deadlock Avoidance and Deadlock Handling

Process Synchronisation: Race Condition, Critical Section, Semaphores, Classical problems of synchronization, Monitors

SECTION-C
Memory Management: External fragmentation, Internal fragmentation, Compaction, Paging, Segmentation, Virtual memory, Demand paging.

Device Management: Dedicated devices, shared devices, virtual devices, channels, I/O traffic controller, I/O scheduler, I/O Device handlers.

SECTION-D
Disk Scheduling: FCFS, SSTF, SCAN, C–SCAN, N–Stop Scan

Introduction to Multiprocessor and Distributed Operating Systems

Case Studies: Windows 8x/XP/2000, UNIX, LINUX to be discussed briefly.

Practicals:

Implementation of scheduling algorithm, Banker's algorithm, memory management technique (First Fit, Best Fit, Worst Fit), Practical concept of virtual memory.

Text / References:

1. Peter B. Galvin, A. Silberchatz: Operating System Concepts, Addison Wesley, 6thEdi., 2003.

2. A.S. Tenenbaum: Operating System: Design and Implementation PHI, 1989

3. Madnick and Donovan: Operating System, McGraw Hill, 1973.

4. P.B. Henson: Operating System Principles, Prentice Hall, 1973.

5. P.B. Henson: Architecture of concurrent programs, Prentice Hall, 1977.

6. A.C. Shaw: Logic Design of operating System, Prentice Hall, 1974.

7. M.J. Bach: Design of UNIX Operating system, PHI, 1986.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–IV
(Credit Based Evaluation and Grading System)

CSL–241: DATA COMMUNICATION

Internal Marks: 20   CREDITS
External Marks: 80   L   T   P
                                                        3   0   1

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A
OSI Reference Model, Concepts of layer, protocols, layer interfaces; TCP/IP Model.

Network topologies, LAN, MAN, WAN.

Transmission Media: Twisted pair, coaxial cables, fibre–optics cables.

Wireless Transmission: Electromagnetic spectrum, Radio transmission, Microwave Transmission, Infrared, and Millimeter Waves, Lightwave Transmission.

SECTION-B
Error Detection and correction, sliding window protocols, Multiple Access protocols: ALOHA, CSMA/CD

LAN standards: Ethernet, Wireless LAN Standards , Bluetooth Architecture

Repeaters, Hubs, Bridges, Switches, Routers, Gateways

SECTION-C
Virtual Circuits and datagrams, Routing Algorithms, Congestion Control Algorithms. Internetworking. Elements of Transport Protocol

SECTION-D
Fundamental of Data Compression Techniques and Cryptography.

Domain Name System, Electronic Mail, FTP, Worldwide web (WWW), IPv4, IPv6

Practicals:

- Hands on practice for preparing cross cable & straight cable.
- Hands on practice of various Communication Media (both Guided and Unguided).
- Study of various Topologies and Setup.
- Configure various network devices like Switch, Router etc.
- Simulation of OSI Reference Model.

- Implement various error detection algorithms for Noisy channel.

- Simulate and implement stop and wait protocol for noisy channel.

- Simulate and implement go-back-N and sliding window protocols.

- Simulate and implement Routing Algorithms.

- Hands on Practice of various servers like DHCP, Proxy and FTP.

- Implementation of various Cryptography Algorithms.

Relevant Books:

1. Tannanbaum, A.S. : Computer Networks, Prentice Hall, 1992 2nd Ed.
2. Tannanbaum, A.S. : Computer Networks, Prentice Hall, 1992 3rd Ed.
3. Stallings, William : Local Networks : An introduction Macmillan Publishing Co.
4. Stallings, William : Data & Computer Communication Macmillan Publishing Co.
5. Black : Data Networks (PHI) 1988.

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–IV
(Credit Based Evaluation and Grading System)

CSL–243: SYSTEM PROGRAMMING

Internal Marks: 20   CREDITS
External Marks: 80   L   T   P
                                                                                3   1   0

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four
Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are
required to attempt five questions, selecting at least one question from each Section. The fifth
question may be attempted from any Section.

SECTION-A

Introduction: Foundations of System Programming, General Machine Structure, Simplified
Machine Architecture & its components, System software & its components.
Assemblers: Low Level Languages, Basics of an assembly language, instructions & Basic
elements, Types of Statements & format, Assembler & its design, Pass structure of assemblers,
Design of two pass assembler.

SECTION-B

Macro Processors: Introduction, Macro definition & expansion, Arguments in Macros,
Concatenation of Macro Parameters, Generation of unique labels, Conditional Macro Expansion,
Nested macros, Macros Defining Macros, Macro processor Design, Two pass & single pass
macro processor, implementation within an assembler.

SECTION-C

Loaders& Linkers: Introduction, Basic Loader Functions, Loader Schemes, Design of an
absolute Loader, Relocating Loaders, Design of a linking loader, Linkage Editors & its
functions, Dynamic Linking, Bootstrap Loader.

SECTION-D

Introduction to Compilers: Introduction, Compiler Design & its Phases, Lexical analysis,
Parsing, storage Management, Intermediate code generation, Code Optimization & Generation,
interpreters, Incremental compilers, Cross & P-code compilers.
Editors & Debuggers: Introduction to a text editor & its types, Interactive debugging systems.

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(Credit Based Evaluation and Grading System)

Texts / References:

1. Barron D.W., Assemblers and Loaders, 2/e New York, Elsevier, 1972.

2. Beck L.L., Systems Software: An Introduction to Systems Programming, Addison–Wesley, 1985.

3. Calingaret, P, Assemblers, Compilers and Program Translation Rockville, MD, Computer Science Press, 1979.

4. Donovan J.J., Systems Programming, New York, McGraw Hill, 1972.

5. Groslinc G.W., Assembly and Assemblers, The Motorola 68000 Family, Prentice Hall, Englewood Cliffs, 1988.

6. Ullman. J.D., Fundamental Concepts of Programming systems , Addison–Wesley 1976.

7. Dhamdhere, D.M., Introduction to Systems Software, Tata McGraw Hill, 1996.

8. Glingaret P., Assembles Loaders and Compilers, Prentice Hall.

9. Echouse, R.H. and Morris, L.R., Minicomputer Systems Prentice Hall, 1972.

10. Rochkind M.J., Advance C Programming for Displays, Prentice Hall 1988.

11. Biggerstaff, T.S. Systems Software Tools Prentice Hall 1986.

12. Finsett, C.A., The Craft of Text Editing Springer Verlag, 1991.

13. Shooman H.L., Software Engineering McGraw Hill 1983.

14. Aho A.V. and J.D. Ullman Principles of Compiler Design Addison Wesley/Narosa 1985.

15. Aho A.V. and Ullman J.D. The theory of Parsing, Translation and compiling, Vol. I Parsing.Prentice Hall Inc. 1972.

16. Aho A.V. and Ullman J.D. The theory of Parsing, Translation and compiling, Vol. II Compiling.Prentice Hall Inc. 1972.

17. Aho A.V., Sethi R. and Ullman J.D. Compiler, Principles, Techniques and Tools

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–IV
(Credit Based Evaluation and Grading System)

CSL–244: DISCRETE STRUCTURES

Internal Marks: 20   CREDITS
External Marks: 80   L   T   P
                                                          3   1   0

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A
Groups and Rings: Groups, monoids, and Submonoids, Semigroup, Subgroups and Cosets. Congruence relations in semigroups. Morphisms. Normalsubgroups.Cyclic groups, permutation groups, dihedral groups, Rings, subrings, morphism of rings, ideals and quotient rings.

SECTION-B
Graph Theory: Graphs and Multigraphs, Subgraphs, Isomorphic and Homomorphic Graphs, Paths, Connectivity, Bridges of Konigsberg, Traversable Multigraphs, Labeled and Weighted Graphs, Complete, regular and Bipartite Graphs, Tree graphs, Planar Graphs, Graph Colorings, Representing Graphs in Computer Memory. Directed Graphs: Sequential Representation of Directed Graphs, Warshall's Algorithm, Shortest Paths, Linked Representation of Directed Graphs, Rooted Trees, Graph Algorithms, Depth–first and Breadth–first searches, Directed Cycle–Free Graphs, Topological Sort, Pruning Algorithm for Shortest Path. Binary Trees: Complete and Extended trees, Representing trees in memory, Traversing trees, Search trees, Heaps, path Lengths, Huffman's Algorithm.

SECTION-C
Lattices and Boolean algebra: Partially ordered sets, lattices and its properties, lattices as algebraic systems, sub–lattices, direct products, Homomorphism, some special lattices (complete, complemented, distributive lattices). Boolean algebra as lattices, Boolean identities, sub–algebra, Boolean forms and their equivalence, sum of product, product of some canonical forms.

SECTION-D
Recurrence Relations and Generating Functions: Polynomial expressions, telescopic form, recursion theorem, closed form expression, generating function, solution of recurrence relation using generating function

Books Recommended:

1. Trambley, J.P. and Manohar,R: Discrete Mathematical Structures with Applications to Computer Science.

2. Liu C.L.: Elements of Discrete Mathematics.

3. Alan Doerr and Kenneth Levasseur: Applied Discrete Structures for Computer Science

4. NarsinghDeo: Graph Theory.

5. Lipschutz, S. and Lipson, M.: Discrete Mathematics (Schaum's outlines series).

CSA1: B.TECH. (COMPUTER ENGINEERING) SEMESTER–IV
(Credit Based Evaluation and Grading System)

CSL245–: COMPUTER ARCHITECTURE

Internal Marks: 20   CREDITS
External Marks: 80   L   T   P
                                                                             3   1   0

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

Basic computer Organisation and design: Register Transfer language & operations, various Arithmetic, Logic & Shift microoperations instructions, codes, computer registers, instructions, timing & control, instruction cycle, design of a complete basic computer &it's working.

SECTION-B

Programming & controlling the basic computer: Machine & Assembly Language, hardwired & Microprogrammed control, Design of a control unit.

CPU Architecture: General register & stack organization, instruction formats and addressing modes, ALU & Control unit architecture.

SECTION-C

Memory Organisation: Memory hierarchy, main, auxiliary, cache memory, virtual memory paging and segmentation.

I/O Organization: Peripheral Devices, input-output interface, Modes of data transfer programmed & interrupt initiated I/O, DMA, I/O Processors.

SECTION-D

Parallel & Multiprocessing Environment: Introduction to parallel processing, pipelining, RISC Architecture, vector & array processing, Multiprocessing concepts, memory & resource sharing, interprocessor communication & synchronization.

Text/References:

1. Morris Mano: Computer System Architecture, PHI.
2. Hayes J.P.: Computer Architecture & Organisation, McGraw Hill.
3. Stone: Introduction to Computer Architecture: Galgotia.
4. Tanenbaum: Structured Computer Organisation, PHI.