

VERIFIED

National Institute of Technology Srinagar



COURSES & SYLLABI
(Batch 2019 onwards)

First Year for All Branches

VERIFIED

National Institute of Technology

1st Semester (Group A)

Electrical / Electronics & Comm. / Computer Science / Information Technology

S. No.	Course Code	Course Title	Department Offering	Credit	Contact Hours			
					L	T	P	Total
A11	HST101	Basic English and Communication Skills	Humanities	3	2	1	0	3
A12	MAT101	Mathematics I	Mathematics	4	3	1	0	4
A13	EET101	Basic Electrical Engineering	Electrical	4	3	1	0	4
A14	ITT101	Computer Programming	Information Technology.	3	2	1	0	3
A15	CHT101	Engineering Chemistry	Chemistry	4	3	1	0	4
A16	CVT101	Engineering Drawing	Civil	4	1	0	6	7
A17	EEL101	Basic Electrical Engineering Laboratory	Electrical	1	0	0	2	2
A18	CHL101	Chemistry Laboratory	Chemistry	1	0	0	2	2
A19	ITL101	Computer Programming Laboratory	Information Technology	1	0	0	2	2
		Total		25	14	5	12	31

1st Semester (Group B)

Civil/ Mechanical / Chemical / Mett & Mat Science

S. No.	Course Code	Course Title	Department Offering	Credit	Contact Hours			
					L	T	P	Total
B11	HST101 ✓	Basic English and Communication Skills	Humanities	3 ✓	2	1	0	3
B12	MAT101 ✓	Mathematics I ✓	Mathematics	4 ✓	3	1	0	4
B13	MET101 ✓	Elements of Mechanical Engg. ✓	Mechanical	3 ✓	2	1	0	3
B14	PHI101 ✓	Engineering Physics	Physics	4 ✓	3	1	0	4
B15	CHT102 ✓	Environmental Studies	Chemistry	3 ✓	2	1	0	3
B16	CVT102 ✓	Engineering Mechanics ✓	Civil	4 ✓	3	1	0	4
B17	HSL101 ✓	Language Laboratory	Humanities	1 ✓	0	0	2	2
B18	PHL101 ✓	Physics Laboratory ✓	Physics	1 ✓	0	0	2	2
B19	WSL101 ✓	Work shop Practice ✓	Work shop	2 ✓	0	0	4	4
		Total		25	15	6	8	29

Handwritten signatures and dates: 27/5/22, 01/06/22

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National Institute of Technology

2nd Semester (Group A)

Electrical / Electronics & Comm. / Computer Science / Information Technology

S. No.	Course Code	Course Title	Department Offering	Credit	Contact Hours			
					L	T	P	Total
A21	HST102	Advanced English Comm. Skills & Organizational Behavior	Humanities	3	2	1	0	3
A22	MAT102	Mathematics II	Mathematics	4	3	1	0	4
A23	MET101	Elements of Mechanical Engg.	Mechanical	3	2	1	0	3
A24	PHT101	Engineering Physics	Physics	4	3	1	0	4
A25	CHT102	Environmental Studies	Chemistry	3	2	1	0	3
A26	CVT102	Engineering Mechanics	Civil	4	3	1	0	4
A27	HSL101	Language Laboratory	Humanities	1	0	0	2	2
A28	PHL101	Physics Laboratory	Physics	1	0	0	2	2
A29	WSL101	Work shop Practice	Work shop	2	0	0	4	4
		Total		25	15	6	8	29

2nd Semester (Group B)

Civil/Mechanical / Chemical / Mett & Mat Science

S. No.	Course Code	Course Title	Department Offering	Credit	Contact Hours			
					L	T	P	Total
B21	HST102	Advanced English Comm. Skills & Organizational Behavior	Humanities	3	2	1	0	3
B22	MAT102	Mathematics II	Mathematics	4	3	1	0	4
B23	EET101	Basic Electrical Engineering	Electrical	4	3	1	0	4
B24	ITT101	Computer Programming	Information Tech.	3	2	1	0	3
B25	CHT101	Engineering Chemistry	Chemistry	4	3	1	0	4
B26	CVT101	Engineering Drawing	Civil	4	1	0	6	7
B27	EEL101	Basic Electrical Engineering Laboratory	Electrical	1	0	0	2	2
B28	CHL101	Chemistry Laboratory	Chemistry	1	0	0	2	2
B29	ITL101	Computer Programming Laboratory	Information Tech.	1	0	0	2	2
		Total		25	14	5	12	31

Handwritten signatures and dates:
 01/05/22
 01/06/22

Syllabus for B. Tech Semester 1

**DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)**

Subject: Basic Electrical Engineering (EEL-100)	Syllabus for B.Tech:- 1stYear(1stSem) ELE/ECE/CSE/IT		Total CourseCredit:4		
			Contact hour		
Internal Assessment	Mid-Term	Major Exam	L	T	P
10 (Marks)	30 (Marks)	60 (Marks)	3	1	0

Course Outcomes (COs): Upon successful completion of the course, student should be able to:

- CO1:** Analyze the behavior of different electric circuit parameters and have a thorough understanding of different types of energy sources.
- CO2:** Analyze the different configurations of DC circuits using basic circuit laws like KVL, KCL and tools like mesh analysis and nodal analysis.
- CO3:** Apply network analysis theorems like Superposition theorem, Thevenin's theorem, Norton's theorem and Maximum Power Transfer theorem to DC circuits and networks.
- CO4:** Use phasor representation for steady state analysis of sinusoidally excited AC circuits and apply different network techniques for their analysis
- CO5:** Understand the concept of active, reactive power and power factor correction in AC circuits, and analyze various configurations of 3-phase AC circuits

Syllabus:

UNIT-I	Basic Concepts and Electric Circuit Parameters: Review of electric circuit concepts, terminology, basic laws, and electric circuit parameters. ENERGY SOURCES: Ideal and practical voltage and current sources and their transformation, Independent and dependent sources.
UNIT-II	D.C. Circuit Analysis: Power and energy relations, Analysis of series parallel D.C. Circuits, Loop and nodal methods of analysis, Delta-star(Δ -Y) transformation, Superposition theorem, Thevenin's and Norton's theorems, Maximum power transfer theorem.
UNIT-III	Sinusoidal Steady State Analysis of AC Circuits: Basic terminology and definitions, Phasor and complex number representation solutions of sinusoidally excited AC circuits, Power and energy relations in A.C. circuits, Applications of network theorems to A.C. circuits, Resonance in series and parallel circuits.
UNIT-IV	AC Power Analysis: Power and energy relations in AC circuits, Instantaneous power and apparent power, Average power, Concept of power factor, Active and reactive power, Complex power, Maximum power transfer theorem, Power factor corrections.

UNIT-V	Steady State Three- Phase AC Circuits: Characteristics of 3 phase systems, Current and voltage relationships in Δ -Y & Y- Δ configurations, Balanced / un-balanced systems.
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Books Recommended:

Text Books	<ol style="list-style-type: none"> 1. Alexander & Sadiku: Fundamentals of Electric Circuits, 6th Edition McGraw Hill Education. 2. Irwin & Nelms: Basic Engineering Circuit Analysis, 7th Edition, John Wiley and Sons Ltd. 3. Vincent Del Toro: Electric Engineering Fundamentals, 2nd Edition, Pearson Education India.
Reference Books	<ol style="list-style-type: none"> 4. Sergio Franco: Electric Circuit Fundamentals, Oxford University Press 5. Johnson & Hilburn: Basic Electric Circuit Analysis, 5th Edition, John Wiley & Sons Ltd. 6. Hayt & Kimmerly: Engineering Circuit Analysis, 8th Edition, McGraw Hill Education.



DEPARTMENT OF HUMANITIES, SOCIAL SCIENCES & MANAGEMENT
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Basic English and Communication Skills Code: HUL100	Common Syllabus of B. Tech. 1st Semester for All Engineering Branches		Total Course Credits: 03			
Mid-Term	Internal Assessment	Major Exam	Contact Hours			
			L	T	P	Total
[30 Marks]	[10 Marks]	[60 Marks]	2	1	0	3

Course Outcomes (COs):

- CO1:** Identify the main idea(s) and specific details in the text; form words using prefixes and suffixes; use antonyms, synonyms, thereby demonstrating an increase in word knowledge.
- CO2:** Accurately produce grammatical elements such as articles, prepositions, verb tense, modifiers, noun-pronoun, and subject-verb agreement.
- CO3:** Exhibit knowledge of sentence structures, write formal letters and coherent paragraphs with a topic sentence, supporting and concluding sentence.
- CO4:** Demonstrate phonemic knowledge and give an oral presentation using effective delivery strategies.

Syllabus

Unit I

Reading and Comprehension Skills - I

1. Importance and techniques of effective reading
Essay 1: The Raman Effect + Supplementary Reading Passages
2. Improving Comprehension skills, techniques for good comprehension
Essay 2: Ancient Architecture in India + Supplementary Reading Passages
3. Skimming and scanning
Essay 3: Blue Jeans + Supplementary Reading Passages

Unit II

Vocabulary - I

1. Word formation, use of prefixes and suffixes
2. Synonyms and antonyms
3. Prefixes and Suffixes from foreign languages, words from foreign languages

Unit III

Grammar

1. Articles and Prepositions
2. Noun-pronoun agreement and subject-verb agreement
3. Tenses and Misplaced modifiers

Unit IV

Formal Writing Skills

1. Sentences and Paragraphs: Sentence structures, phrases, and clauses, techniques for writing precisely, paragraph writing, organizing principles of paragraphs in documents
2. Letter writing: Formal letters, letter of complaint, requisition letter
3. Formal writing: Nature and style of formal writing; Use of topic sentences and thesis statements.

Unit V

Basic Presentation and Speaking Skills

1. An overview of the sound system in English: Vowels and Consonants
2. IPA (International Phonetic Alphabet) symbols
3. Pronunciation (Activities based on audiotapes)
4. Stress, Rhythm, Intonation
5. Accent: British English and American English
6. Presentation Skills

Text Book:

1. English for Engineers. By N. P. Sudharshana and C. Savitha. Cambridge University Press, 2018.

Reference Books:

2. Oxford Guide to Effective Writing and Speaking Skills. By John Seely. Oxford University Press, Indian Edition, 2008.
3. Professional Speaking Skills. By Aruna Koneru. Oxford University Press, 2015.
4. Intermediate English Grammar: Reference and Practice for South Asian Students. By Raymond Murphy. Cambridge University Press, 1994.

DEPARTMENT OF INFORMATION TECHNOLOGY
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL, SRINAGAR - 190006 (J&K)

Subject: Computer Programming Code: ITL 100	Common Syllabus for B.Tech. 1st & 2nd Semester of All Engineering Branches			Total Course Credits: 03			
Mid-Term	Class Assessment	Major Exam	Contact Hours				
			L	T	P	Total	
30 Marks	10 Marks	60 Marks	3	0	0	3	

Course Outcomes (COs)

- CO1:** To provide exposure to problem solving through C programming.
- CO2:** To gather knowledge of various library functions, syntax and semantics of the 'C' language.
- CO3:** To understand the concept of conditional and iterative statements in C language.
- CO4:** To understand the data types offered by the C language including complex data types: arrays, structures and pointers.
- CO5:** To implement the concept of strings and file handling in C programming.

Course Details:

Introduction to C Programming: Engineering problem solving methodology, Flow charts, tracing flow charts, Algorithms, Need for computer Languages, computer languages, High-level languages, History of C, A simple C Program.

C Language preliminaries: Program structure, C character set, Identifiers and keywords, Data types, Declarations, Expressions, statements symbolic constants, Library functions, pre-processors, # include, #define.

Input-Output: getchar, putchar, scanf, printf, gets, puts and other related input output functions.

Operators and expressions: operators in C, arithmetic, unary, logical, bit-wise, assignment and conditional operators.

Control statements: if else, switch, break, Continue, and goto statements, While, do-while, for statements, nested loops, loops using goto. comma operators and variants of above control structure.

Functions: Defining and accessing, passing arguments, Function prototypes, Recursion, Library functions, Static functions

Arrays: Defining and processing, Passing arrays to a function, matrices as 2D arrays, Multi-dimensional arrays.

Pointers: Declarations, Passing pointers to a function, Operations on pointers, Pointer Arithmetic, Pointers and arrays, Arrays of pointers and function pointers. Dynamic memory allocation of arrays and higher dimensional arrays using malloc () function.

Strings Fundamentals: of character and strings, string handling library functions, pointer to strings, dynamic allocation for strings.

Structures and Unions: Defining and accessing structure, structure as function arguments, array of structures, pointers to structures, defining and accessing union.

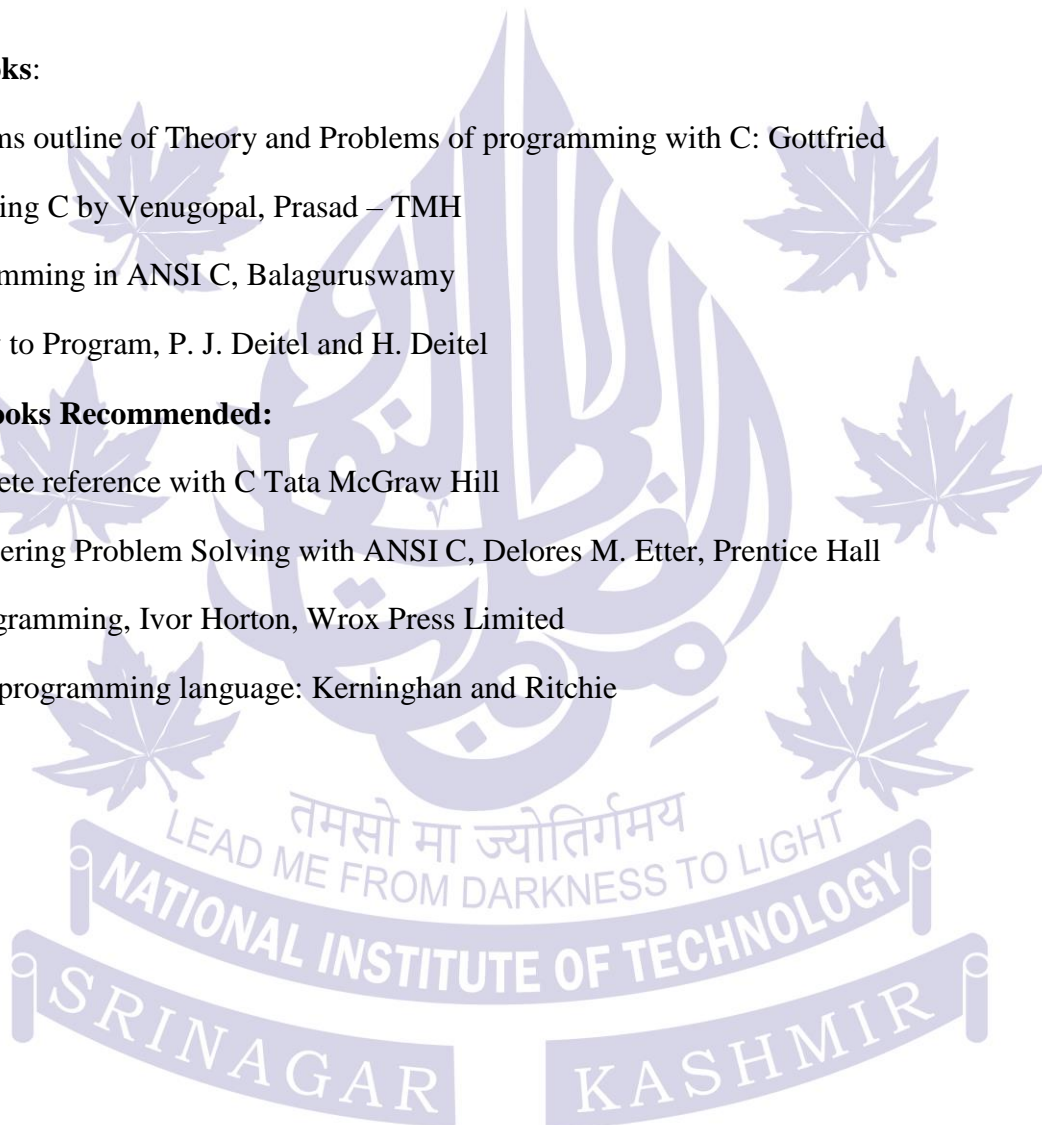
File Handling: Files, ascii files, binary files, File operation such as storing, retrieving and updating a file.

Text Books:

1. Schaums outline of Theory and Problems of programming with C: Gottfried
2. Mastering C by Venugopal, Prasad – TMH
3. Programming in ANSI C, Balaguruswamy
4. C How to Program, P. J. Deitel and H. Deitel

Other Books Recommended:

1. Complete reference with C Tata McGraw Hill
2. Engineering Problem Solving with ANSI C, Delores M. Etter, Prentice Hall
3. C Programming, Ivor Horton, Wrox Press Limited
4. The C programming language: Kerninghan and Ritchie



DEPARTMENT OF CHEMISTRY
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Engineering Chemistry Code: CYL100	Common Syllabus for B.Tech. 1st & 2nd Semester of All Engineering Branches		Total Course Credits: 04			
Mid-Term	Class Assessment	Major Exam	Contact Hours			
			L	T	P	Total
[30 Marks]	[10 Marks]	[60 Marks]	3	1	0	4

Course Outcomes (COs)

CO1: To understand the properties and uses of polymeric materials.

CO2: To learn the basic concepts of water chemistry and softening methods

CO3: To gain knowledge about fuels, types of lubricants and their uses

CO4: To learn fundamentals of corrosion and its prevention techniques.

Unit I

High Polymers: Introduction, classification, types of polymerization, mechanisms of polymerization (free radical, cationic, anionic), coordination polymerization and its mechanism, synthesis and applications of some important engineering polymers (Polyethylene, PVC, Polystyrene, Teflon, Polyesters, polyamides, Bakelite and silicones), conducting polymers; classifications, properties and applications in engineering field. **(10 Hours)**

Unit II

Water Chemistry: Introduction, sources of water, impurities in water, hard water, units of hardness, determination of hardness and alkalinity, softening of hard water; Lime-Soda process, Zeolite process and Ion Exchange process, numerical problems based on hardness, alkalinity and LS process, municipal treatment of water for drinking purposes; removal of suspended, dissolved and biological impurities-sterilization by chlorination (Effective and break-point chlorination). **(10 Hours)**

Unit III

Fuels and Lubricants: Fuels: Introduction, classification of fuels, characteristics of a good fuel calorific value; HCV and LCV, Dulong's formula, Determination of calorific value by Bomb Colorimeter, Numerical problems. Coal: analysis of coal - proximate and ultimate analysis, significance of the analysis.

Lubricants: Introduction, mechanisms of lubrication, hydrodynamic, boundary and extreme pressure lubrication, classification of lubricants: liquid, semi solid and solid lubricants.

Lubricating oils; fatty oils, mineral oils, blended oils, properties of lubricating oils with special reference to flash point, aniline point, viscosity and viscosity index. **(10 Hours)**

Unit IV

Corrosion and its Prevention:

Introduction, types of corrosion: Dry and wet corrosion (pitting corrosion, crevice corrosion, stress corrosion, inter-granular corrosion), corrosion prevention and control by proper design and material selection, cathodic protection, anodic protection, protective coatings. **(10 Hours)**

BOOKS RECOMMENDED:

Text Books

1. P. C. Jain: Engineering Chemistry, 16th. Edition, Dhanpat Rai Publishing Company, India.
2. Dara S.S., A Text Book of Engineering Chemistry, 12th. Edition, S. Chand and Company, India.
3. J. C. Kuriacose and J Rajaraman; Chemistry in engineering and Technology, Volumes I and II, Tata Mc Graw Hill Publishing Co. Limited, New Delhi

Reference Books

1. V. R. Gowriker, N.V. Viswanathan and Jayadev Sreedhar: Polymer Science, Wiley Eastern Limited, New Delhi.
2. C.V. Agarwal: Chemistry of Engineering Materials (Tata Publishing Works, Varanasi).
3. R. M. E. Diamand: Applied Chemistry for engineers (Pitman).



DEPARTMENT OF CIVIL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL, SRINAGAR - 190006 (J&K)

Subject: Engineering Drawing (Code: CIP: 100)	Syllabus for B.Tech. 1st Year Common for all branches	Total Course Credit: 4			
Mid-Term Examination	Continuous Assessment	Major Exam	L	T	P
30 Marks	10 Marks	60 Marks	2	0	2

Course Objective: To inculcate the ability to translate geometric and topological information of common engineering object (two/three dimensional) into engineering drawing using standard graphical techniques.

Course Outcomes:

CO1: Comprehend general projection theory, with an emphasis on the use of orthographic projection to represent three-dimensional objects in two-dimensional views.

CO2: Apply auxiliary or sectional views to most practically represent engineered parts.

CO3: Understand the intersection, development of surface of body and fasteners.

CO4: To interpret Orthographic, Isometric and Perspective views of objects.

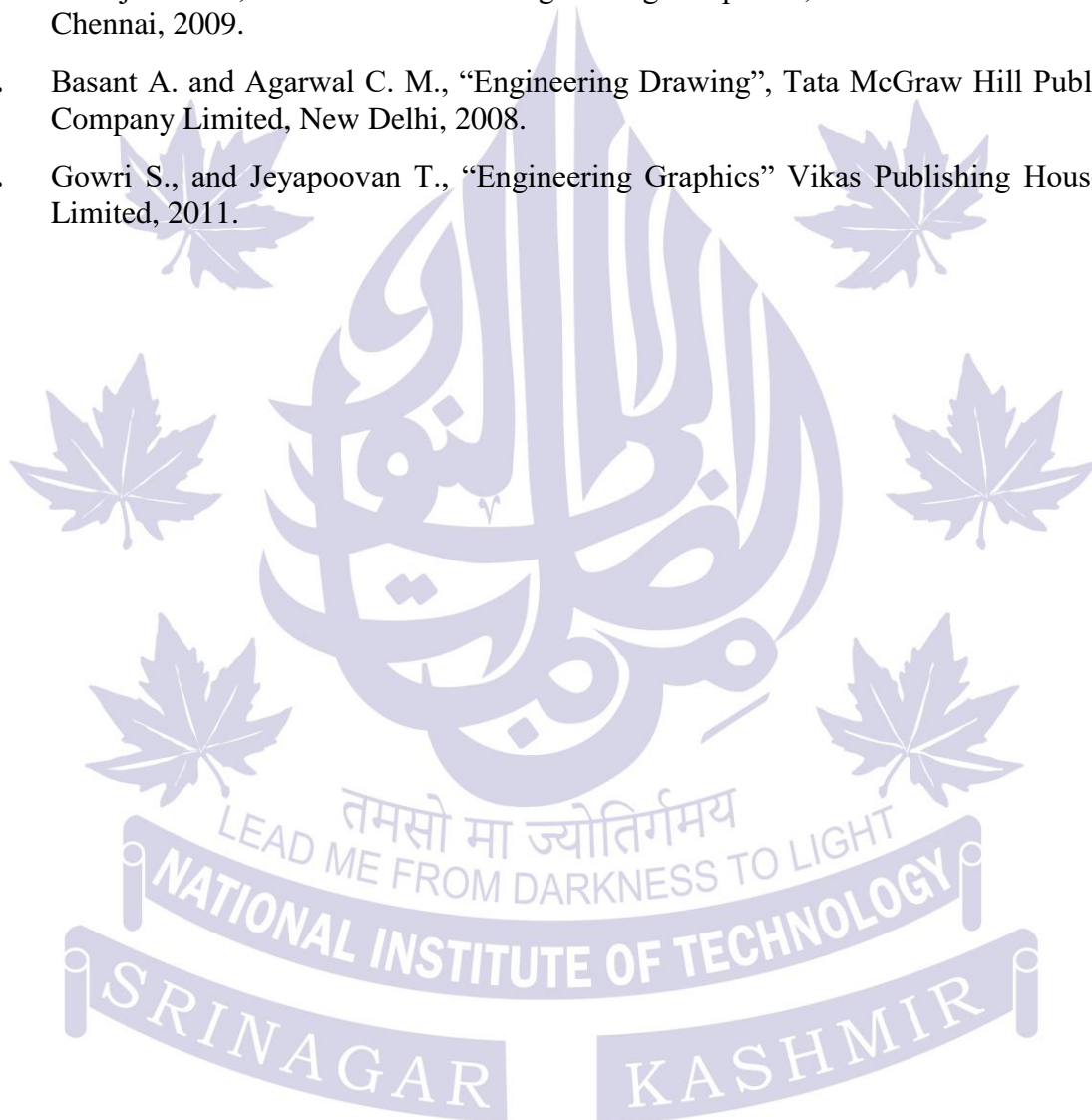
S. No.	Contents	Contact Hours
01.	Types of projections, concept of solid as 3-dimensional object, lines and planes, first and third angle practices. Projections of simple geometrical solids, placed in simple positions with single rotation of the face, edge or axis of solid with respect to one of the principal planes of projection.	24
02.	Section of simple geometrical solids, types of sectional planes, true shape of sections	12
03.	Intersection of surfaces, simple case of intersection of two prisms, two cylinders, and cone and a cylinder Development of surfaces of simple sectional solids and intersecting solids	12
04.	Isometric projections of given orthographic projections. Orthographic projections of simple blocks	12

Text book:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 50th Edition, 2010.

References:

1. Gopalakrishna K. R., “Engineering Drawing” (Vol. I&II combined), Subhas Stores, Bangalore, 2007.
2. Shah M. B., and Rana B. C., “Engineering Drawing”, Pearson, 2nd Edition, 2009.
3. Luzzader, Warren. J. and Duff, J. M., “Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Venugopal K. and Prabhu R. V., “Engineering Graphics”, New Age International (P) Limited, 2008.
5. Natrajan K.V., “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2009.
6. Basant A. and Agarwal C. M., “Engineering Drawing”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
7. Gowri S., and Jeyapoovan T., “Engineering Graphics” Vikas Publishing House (P) Limited, 2011.



DEPARTMENT OF MATHEMATICS
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Mathematics I Code: MAL 100	Common Syllabus for B.Tech. 1st Semester of All Engineering Branches		Total Course Credits: 04			
Mid-Term	Class Assessment	Major Exam	Contact Hours			
			L	T	P	Total
[30 Marks]	[10 Marks]	[60 Marks]	3	1	0	4

Course Outcomes: At the end of the course, a student should be able to:

CO1: Solve problems related to differentiation and partial differentiation.

CO2: Solve problems of the functions of several functions.

CO3: Solve ordinary differential equations by various techniques.

CO4: Solve ordinary differential equations by Frobenius method.

CO5: Apply the concepts of ordinary differential equations in solving problems related to relevant branches

Syllabus

Unit I

Differential Calculus: Successive differentiation, Leibnitz theorem, Asymptotes, Tangent & normal, Curvature, Double points, Partial derivatives, Taylor series Expansions, Total derivatives and Euler's theorem, Curve tracing. **(15 Hours)**

Unit II

Several Variable Calculus: Limit, continuity and differentiability of functions of several variables, Taylor's expansion of functions of two variables, maxima and minima of functions of two variables, Lagrange's method of multipliers. **(10 Hours)**

Unit III

Differential Equations: Exact differential equations, Reducible to exact differential equations, Linear differential equations of second and higher order with constant and variable coefficients, Simultaneous differential equations, Simultaneous differential equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$, Method of Variation of parameters, Method of undetermined coefficients, Nonlinear differential equation, Series solution of differential equations (Frobenius method). **(10 Hours)**

Unit IV

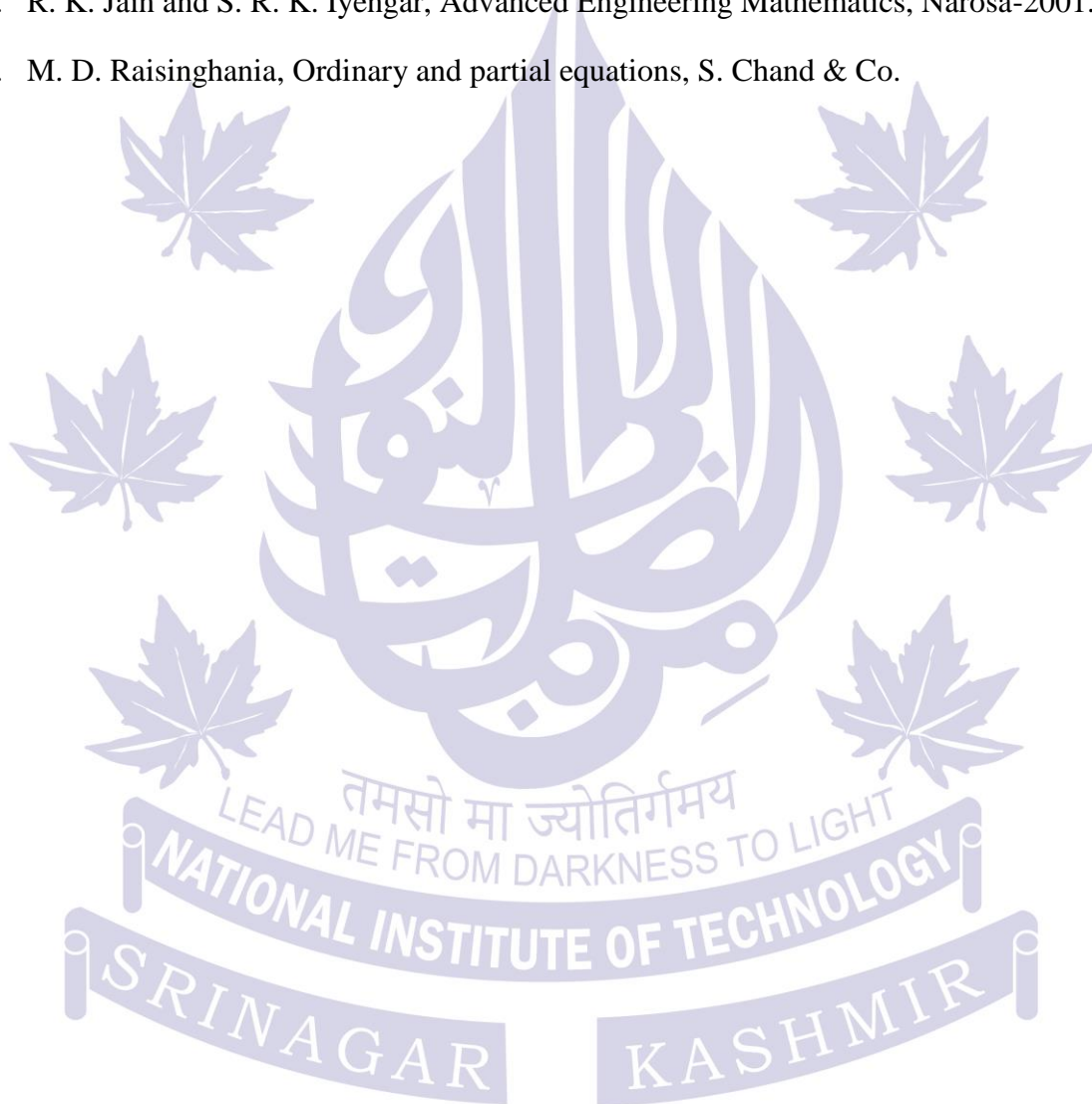
Applications of Ordinary Differential Equations: Application of ordinary differential equations in relevant branches. **(3 Hours)**

TEXTBOOKS:

1. G. Prasad, Differential Calculus, Pothishala Private Limited.
2. S. Narayan, Integral Calculus. S. Chand and Co.
3. H. T. H Piaggio, Differential Equations and its applications, Orient Longman Limited.

REFERENCES:

1. E. Kreyszig, Advanced Engineering Mathematics, New Age International Limited.
2. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, Narosa-2001.
3. M. D. Raisinghania, Ordinary and partial equations, S. Chand & Co.



DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Basic Electrical Engineering Laboratory (EEL 100P)	Syllabus for B. Tech: 1st Year (1stSem) ELE/ECE/CSE/IT	Total Course Credit: 1		
		Contact hour		
Continues Assessment	Major Exam	L	T	P
40 (Marks)	60 (Marks)	0	0	2

Course Outcomes (COs) : Upon successful completion of the course , student should be able to do:

- CO1 Verify and analyze the basic elements of electrical networks.
- CO2 Experimental study of KCL, KVL, Star-Delta transformation and theorems
- CO3 Experimental study of behaviors of Resistance, Inductance, Capacitance and their combinatory circuits.
- CO4 Experimental study of power and power factor, and realization of power and voltage waveforms.

List of Experiments:

1	To study the color coding of resistors
2	Connection of Ammeters, Voltmeters, Wattmeter and multi-meters in DC and AC circuits and selection of their ranges.
3	To study the series / parallel operation of resistors and verifying their effective values by LCR Q-meter.
4	To verify the KVL and KCL in DC circuits.
5	To verify the star delta transformation of networks.
6	To verify the star delta transformation of networks.
7	To verify the superposition theorem.
8	To verify the maximum power transfer theorem
9	Basic R, L, C circuits excited from A.C
10	To measure electric power in single-phase AC circuits with resistive load, RL load and RLC load
11	To study the series resonance
12	To study the parallel resonance.
13	To measure the power and power factor in three phase AC circuits.
14	To study the handling of CRO and use it for the study of different voltage waveforms.

DEPARTMENT OF CHEMISTRY
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Chemistry Laboratory Code: CYP100	Common Syllabus for B.Tech. 1st & 2nd Semester of All Engineering Branches	Total Course Credits: 01			
Continuous Assessments	Major Exam	Contact Hours			
		L	T	P	Total
[40 Marks]	[60 Marks]	0	0	2	2

Course Outcomes (COs)

- CO1:** To experimentally learn about synthesis of polymeric materials.
CO2: To acquire practical knowledge of determination of various parameters of water.
CO3: To acquire the knowledge about analysis of fuels, especially coal.
CO4: To acquire the knowledge about analysis of lubricants.

List of Experiments

Sr. No.	Experiments
1.	Synthesis of Phenol formaldehyde resin.
2.	Synthesis of Urea formaldehyde resin.
3.	To determine the total, permanent and temporary hardness of water by EDTA method. CO
4.	To determine alkalinity of given water samples/alkali mixtures by warder's Method.
5.	To estimate percentage of available chlorine (free chlorine) in bleaching powder/water.
6.	Proximate analysis of coal.
7.	To determine the acid value of given lubricating oils.
8.	To determine the aniline point of given lubricating oils.

DEPARTMENT OF INFORMATION TECHNOLOGY
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL, SRINAGAR - 190006 (J&K)

Subject: Computer Programming Lab Code: ITP100	Common Syllabus for B.Tech. 1st & 2nd Semester of All Engineering Branches	Total Course Credits: 01			
Continuous Assessments	Major Exam	Contact Hours			
		L	T	P	Total
[40 Marks]	[60 Marks]	0	0	2	2

Course Outcomes (COs)

- CO1:** To provide exposure to problem solving through C programming.
- CO2:** To illustrate the concept of various tools available in C and to learn how to solve the problems using the code.
- CO3:** To gather the knowledge of basics of programming including various library functions.
- CO4:** To learn how to write a program in C using loops, functions, pointers, structures etc.

Lab Details:

1. Programs to understand how integers, characters, and strings are stored and represented in C.
2. Programs to understand the ASCII character encoding.
3. Programs to understand how to use different operators available in C.
4. Programs to understand differences between a logical and arithmetic operator.
5. Programs to understand differences between a logical and bitwise operator.
6. Programs to obtain a full understanding of signed, unsigned, long and short numbers in C.
7. Programs to understand exactly how numbers are represented in computers (octal, hexadecimal and binary numbers systems).
8. Programs to evaluate algebraic expressions in C.
9. Programs to understand printing of various data types using different output functions.
10. Programs to exercise all flags in printf() functions.
11. Programs to understand printing of display patterns of numbers and asterisks.
12. Programs to understand taking input from user using different input functions.
13. Programs to exercise all flags in scanf() functions.

14. Programs to understand how arrays work in C, how to use them, and how they are stored in memory.
15. Programs to understand searching in an array.
16. Programs to understand sorting techniques using arrays.
17. Programs to understand pointers in C.
18. Programs to understand the relationship between array indexing and pointer arithmetic.
19. Programs to understand dynamic memory allocation especially with respect to 1D and 2D arrays.
20. Programs to understand modularize of code using functions.
21. Programs to implement function with/without arguments and with/without return types.
22. Programs to understand direct and indirect recursions using functions.
23. Programs to use pointer to pass the address of data and arrays to functions.
24. Programs to understand static data types and static functions.
25. Programs to understand creating, accessing and using structures.
26. Programs to understand use of arrays of structures.
27. Programs to understand pointers to structures and pointers as structures members.
28. Programs to understand creating, accessing and using unions.
29. Programs to understand creating, reading, writing a file.
30. Programs to understand taking input through arguments to main () function.



DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL, SRINAGAR - 190006 (J&K)

Element of Mechanical Engineering (Code: MEL 100)	Contact Hours – 42	Total Course Credit: 3			
Mid-Term	Class Assessment	Major Exam	L	T	P
30 Marks	10 Marks	60 Marks	3	0	0

Course Objective:

This course is intended to enlighten the first-year undergraduate students about some of the technical issues that mechanical engineering addresses, and identify its impact in solving global, social, environmental, and economic problems.

Course Outcomes:

CO1: Identify and select materials and manufacturing processes for fabricating prototypes and engineering products.

CO2: Explain the significance of thermodynamic processes in energy conversion and conservation.

CO3: Explain the significance of fluids engineering to energy conversion, and to diverse fields as aerodynamics, medicine, etc.

CO4: Identify and select various motion and power transmission elements for a particular application.

S. No.	Contents	Contact Hours
01.	Materials and Manufacturing Techniques: Recent advances in mechanical engineering, Role of Computer Aided Design, Simulation and 3D printing. Units and measurements. Engineering Materials and Materials Response. Basic manufacturing processes, conventional and non-conventional fabrication processes.	9
02.	Thermal and Energy Systems: System and Surroundings, Thermodynamic processes, First and Second law of thermodynamics,	12

	Concept of Entropy. Engine Cycles and Efficiency. Basic idea of internal combustion engines. Heat transfer through conduction, convection and radiation. Heat exchangers. Energy conservation and conversion.	
03.	Fluid Properties and their Applications: General properties of fluids, Fluid statics, Pressure measurement. Equation of fluid motion, Bernoulli's Equation. Viscous Effects: Viscosity, Laminar and Turbulent Flows. Introduction to hydraulic machines: turbines, pumps, their types and applications in energy conversion.	12
04.	Motion and Power Transmission: Rotational motion, Design application: Gears, Speed, torque and power in gear sets. Simple and compound gear trains, Design application: Belt and Chain drives.	9

Text Books:

1. An introduction to Mechanical Engineering by Jonathan Wickert, and Kemper Lewis, Fourth Edition, Cengage Learning, 2017.
2. Moran, M.J., Shapiro, "Fundamentals of Engineering Thermodynamics", John Wiley, 2005.

Reference Books:

1. Cengel, Y., Boles, "Thermodynamics", Mc-Graw Hill, 2001.
2. Joseph E. Shigley, "Mechanical Engineering Design", Tata Mc-Graw Hill



DEPARTMENT OF PHYSICS
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Engineering Physics Code: PHL100	Common Syllabus for B.Tech. 1st & 2nd Semester of All Engineering Branches		Total Course Credits: 04			
Mid-Term	Class Assessment	Major Exam	Contact Hours			
			L	T	P	Total
[30 Marks]	[10 Marks]	[60 Marks]	3	1	0	4

Course Outcomes (COs)

- CO1:** Students will remember the concepts of vector calculus and will be able to apply in electrodynamics.
- CO2:** Students will understand basic quantum mechanics and will be able to evaluate related problems.
- CO3:** Students will understand the concepts of Theory of Relativity.
- CO4:** Students will understand and apply the working principle of lasers and optical in various applications in science & technology.
- CO5:** Students will understand and apply the concepts of semiconductor physics in electronics devices.

Unit I

VECTOR CALCULUS AND ELECTRODYNAMICS: Gradient, divergence, curl and their physical significance. Laplacian in rectangular, cylindrical and spherical coordinates, vector integration, line, surface and volume integrals of vector fields, Gauss-divergence theorem, Stoke's theorem and Green theorem of vectors. Maxwell equations, electromagnetic wave in free space and its solution in one dimension, energy and momentum of electromagnetic wave, Poynting vector, problems. **(8 Hours)**

Unit II

QUANTUM MECHANICS: Origin of the quantum mechanics, interpretation of wave function, Normalization, Schrodinger time-independent & time-dependent equations, basic postulates of the quantum mechanics, probability current density, expectation values, operators, Hermitian operators, commutator relation between position & momentum operators; applications of Schrödinger equation in particle in a box, single step barrier, harmonic oscillator, problems. **(8 Hours)**

Unit III

THEORY OF RELATIVITY: Inertial frames of reference, Galilean and Lorentz transformations, postulates of relativity, time dilation, twin paradox, length contraction,

relativistic mass, energy and momentum, equivalence of mass and energy, Doppler effect in light and its application in expanding of universe, problems. **(8 Hours)**

Unit IV

LASER & FIBER OPTICS: Introduction; absorption and emission, Einstein's coefficients & equations; metastable states, population inversion, pumping (three and four level laser schemes), basic parts of a laser, characteristics of laser radiations; classification of lasers, Ruby laser, He-Ne laser, gas laser; applications of lasers in holography.

Basics of optical fiber, total internal reflection, acceptance angle, numerical aperture; modes of propagation, single mode step index optical fiber, multimode step index optical fiber, graded index fiber, losses, dispersion in optical fiber, intermodal and intramodal dispersion, applications of optical fiber; problems. **(10 Hours)**

Unit V

SEMICONDUCTOR PHYSICS: Introduction to semiconductors; Intrinsic and extrinsic semiconductors; Direct and indirect band gap semiconductors; Carrier concentration in semiconductors; mechanism of current conduction in semiconductors; Dependence of Fermi level on carrier-concentration, carrier generation and recombination; carrier transport: diffusion and drift; fabrication, mechanism and I-V characteristics of p-n junction; Zener diode; measurement of conductivity-four probe, Hall effect; Problems. **(8 Hours)**

BOOKS RECOMMENDED:

1. Introduction to Electrodynamics by David J. Griffith (Prentice- Hall of India Private limited).
2. Introduction to Classical Mechanics by R. G. Takwale and P.S. Puranik (Tata-McGraw Hill Publishing Co).
3. Concept of Modern Physics by Arthur Besier, Shobhit Mahajan & S. Rai Choudhury (McGraw Hill Education).
4. Quantum Mechanics by G. Aruldas (PHI learning).
5. Quantum Physics by H C Verma (Surya Publications, Ghaziabad).
6. Introduction to Special Relativity by Robert Resnick (Wiley).
7. LASERS (Theory and Application) by K. Thyagarajan & A.K. Ghatak (Macmillan).
8. Semiconductor Physics and Devices by Neamen Donald (McGraw Hill).
9. Physics of Semiconductor Devices by Kwok K. Ng & S. M. Sze (Wiley).

DEPARTMENT OF CIVIL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL, SRINAGAR - 190006 (J&K)

Engineering Mechanics (Code: CIL- 100)	Contact Hours – 42	Total Course Credit: 4			
Mid-Term	Class Assessment	Major Exam	L	T	P
30 Marks	10 Marks	60 Marks	3	1	0

Course Objective:

To establish an understanding of the techniques needed to solve general engineering mechanics problems.

Course Outcomes:

CO1: Determine the resultants in planer force systems. Identify and quantify all forces associated with a static framework.

CO2: Calculate the center of gravity, center of mass, and centroid for simple and composite volumes. Determine moment of area of plane sections. To determine the forces in members of a plane truss.

CO3: Determine the resultants in planer force systems using energy principles.

CO4: Understand the fundamental concepts of stress and strain and the relationship between both through the strain-stress equations in order to solve problems for simple tri-dimensional elastic solids

CO5: Solve problems in kinematic and dynamic systems

S. No.	Contents	Contact Hours
01.	Statics: Fundamental concepts and laws of mechanics. Equilibrium of bodies: Free-body diagrams, conditions of equilibrium, torque due to a force, statical determinacy. Force systems: principle of moments, resultant of forces, couple systems, equilibrium of rigid bodies, Support reactions.	9
02.	Properties of plane surfaces: First moment of area, centroid, second moment of area etc.	5
03.	Plane trusses: Forces in members of a truss by method of joints and method of sections.	5
04.	Friction: General concept of friction. Static and Dynamic Friction.	4

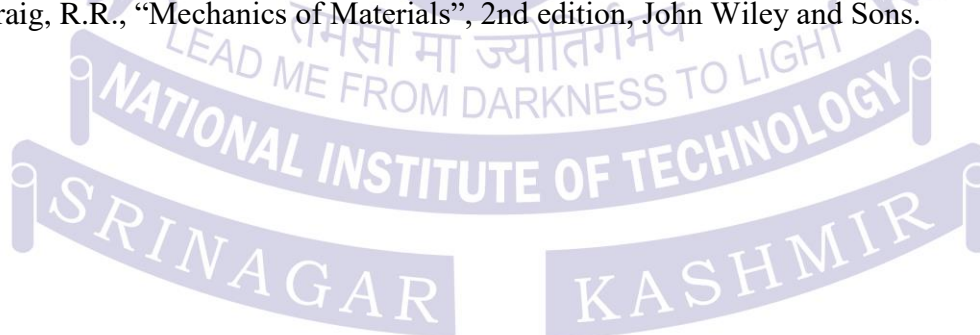
05.	Virtual Work: Principle of virtual work, calculation of virtual displacement and virtual work. Work and Energy: Work and energy, work-energy theorem, principle of conservation of energy, collisions, principles of momentum etc.	8
06.	Dynamics of Rigid Bodies: Newton's Laws, D'Alembert's Principle, Energy Principles.	5
07.	Concept of stress and strain: Conditions of equilibrium, compatibility and stress strain relations. Stress-strain diagrams, Hooke's law, Modulus of elasticity (E), Lateral strains, Poisson's ratio, Multi-axial stress system, Volumetric strain, Bulk modulus (K), Shear stress concept, Modulus of rigidity (G). Relation between E, G and K.	6

Textbook:

1. Hibbeler, R.C., "Mechanics of Materials", 6th SI edition, Prentice Hall.
2. Hibbeler, R.C., Engineering Mechanics: Statics and Dynamics, Prentice Hall (2012).

References:

1. Beer, P.F. and Johnston (Jr.) E.R. "Mechanics of Materials", S.I. Version, Tata McGraw Hill, India, 2001.
1. Beer, Johnston, Clausen and Staab, Vector Mechanics for Engineers, Dynamics, McGraw-Hill Higher Education (2003)
2. Timoshenko and Young, Engineering Mechanics, Tata McGraw Hill Education Private Limited (2000).
3. Shames, I. H. Engineering Mechanics: Dynamics, Pearson Education India (2002).
4. Popov, E.P., Engineering Mechanics of Solids, Prentice-Hall, 1999.
5. Gere J.M. and Goodno, B. J., Strength of Materials, Cengage Learning.
6. Craig, R.R., "Mechanics of Materials", 2nd edition, John Wiley and Sons.



DEPARTMENT OF CHEMISTRY
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Environmental Studies Code: CYL101	Common Syllabus for B.Tech. 1st & 2nd Semester of All Engineering Branches		Total Course Credits: 03			
Mid-Term	Class Assessment	Major Exam	Contact Hours			
			L	T	P	Total
[30 Marks]	[10 Marks]	[60 Marks]	2	1	0	3

Course Outcomes (COs)

CO1: To understand the basic concepts of environmental studies and natural resources.

CO2: To learn about the various eco-systems of nature.

CO3: To gain knowledge about different types of environmental pollutions and their control measures

CO4: To acquire the knowledge about the various social aspects related to the environment.

Unit 1

Environmental studies and Natural Resources: Definition, scope and importance of environmental studies.

Natural Resources; Renewable and non-renewable resources; Natural resources and associated problems;

(a) Forest resources: Use and over-exploitation, deforestation, 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, dam's benefits and problems.

(c) Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers-pesticides problems, water logging, salinity.

(e) Energy Resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. **(10 Hours)**

Unit II

Eco Systems: Concept of an eco-system, Structure and function of an eco-system, Producers, consumers, decomposers, Energy flow in the ecosystems, Ecological succession, Food chains, food webs and ecological pyramids.

Introduction, types, characteristic features, structure and function of the following ecosystems:

- (a) Forest ecosystem
- (b) Grass land ecosystem
- (c) Desert ecosystem.
- (d) Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries) **(10 Hours)**

Unit III

Environmental Pollution: Definition, Causes, effects and control measures of;

- (a) Air pollution
- (b) Soil pollution
- (c) Marine pollution
- (d) Noise pollution
- (e) Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

Disaster management: Floods, earth quake, cyclone and landslides. **(10 Hours)**

Unit IV

Social issues and the Environment: From unsustainable to sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Environmental ethics: issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

Environment protection Act, Air (prevention and control of pollution) Act, Water (prevention and control of pollution) Act, Wildlife protection Act, Forest conservation Act, Issues involved in enforcement of environmental legislations. **(10 Hours)**

Recommended Books:

1. Textbook of Environmental studies, Erach Bharucha, UGC.
2. Fundamental concepts in Environmental Studies, D. D. Mishra, S Chand & Co Ltd.

DEPARTMENT OF HUMANITIES, SOCIAL SCIENCES & MANAGEMENT
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Laboratory Code: HUP100	Language	Common Syllabus of B. Tech. 1st & 2nd Semester for All Engineering Branches	Total Course Credits: 01			
Mid-Term		Major Exam	Contact Hours			
			L	T	P	Total
[40 Marks]		[60 Marks]	0	0	2	1

Course Outcomes (COs)

- CO1.** Demonstrate phonemic awareness by recognizing vowel and consonant sounds in English; and make correct pronunciation.
- CO2.** Answer questions based on audio recordings of native speakers of English; Identify syllables, syllable structure, and word stress correctly; detect rhythm in phrases and sentences; employ the rules and patterns of intonation, and exhibit British and American Accent clearly.
- CO3.** Introduce him/herself confidently; express opinions and effectively show agreement and disagreement with the opinions of others; actively participate in group discussions.
- CO4.** Prepare for interviews by demonstrating learning of verbal and non-verbal communication skills during mock interviews; Give an oral presentation in class using effective delivery strategies.

Syllabus

Unit 1

Speaking, Listening, and Pronunciation:

Phonetics: An overview of the sound system in English: Vowels and Consonants

Listening Comprehension

Syllable Structure and Syllable Break-up

Pronunciation

Stress, Rhythm, Intonation

Accent: British English and American English

Unit II

Communication and Presentation Skills

Situational Dialogues, Role Play

Self-introduction and Introducing others

Greetings, Expressing opinion, agreement and disagreement

Practice in Group Discussions, Interview Practices, Presentation Skills

Suggested Books:

1. Professional Speaking Skills. By Aruna Koneru. Oxford University Press, 2015.
2. Oxford Guide to Effective Writing and Speaking Skills. By John Seely. Oxford University Press, Indian Edition, 2008.
3. Developing Communication Skills. 2nd Edition. By Krishna Mohan and Meena Banerji. Published by Macmillan, 1990, 2009.
4. Effective Business Communication. 7th Edition-Special Indian Edition. By Herta A Murphy, Herbert W Hildebrandt, Jane P Thomas. Published by McGraw Hill Education. 1997, 2018.

Web and Software Resources:

1. Lessons and Exercises based on Words Worth English Language Lab Software
2. Lessons and Exercises based on British Council English Learning web resources



DEPARTMENT OF PHYSICS
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Physics Laboratory Code: PHP100	Common Syllabus for B.Tech. 1st & 2nd Semester of All Engineering Branches	Total Course Credits: 01			
Continuous assessments	Major Exam	Contact Hours			
		L	T	P	Total
[40 Marks]	[60 Marks]	0	0	2	2

Course Outcomes (COs)

- CO1:** Students will be able to understand the basic principle of designed experiments through simple scientific tools.
- CO2:** Students will be able to perform different experiments.
- CO3:** Students will be able to evaluate and interpret scientific data.
- CO4:** Students will be able to create different experiments based on scientific understanding.

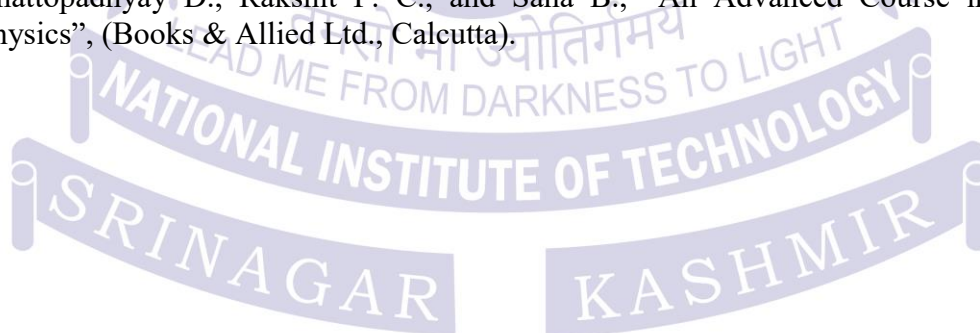
List of Experiments

1. Determine the value of 'g' by bar pendulum.
2. Determine the value of 'g' by Kater's
3. Determine the reduction factor of a tangent galvanometer
4. To study the variation of magnetic field along the axis of current carrying circular coil.
5. Determination of the value of Stefan' constant.
6. Determination of young's modulus of elasticity by bending of beam.
7. Determination of refractive index of liquid
8. Determination of absorption coefficient of liquid.
9. Determination of standing waves on a string by Melde' experiment.
10. Determine of wavelength of a Monochromator
11. Determine the wavelength of Monochromator
12. Determination of refractive index of prism by spectrometer.
13. Determination of specific charge using Magnetron valve helical method

14. Determination of specific rotation of optically active substance by Polarimeter
15. Study the Hall Effect and determine Hall coefficient, carrier density and carrier mobility of a given semiconductor.
16. Determine the band gap of a given semiconductor material.
17. Determination of a Planck's constant by measuring radiation in a fixed spectral range.
18. Determine the coefficient of viscosity of glycerin by falling sphere method.
19. Study of the characteristics of a G.M. Counter and to study of the statistical nature of radioactive decay.
20. To study the characteristics of a solar cell.

BOOKS RECOMMENDED:

1. Practical Physics by Gupta & Kumar (Pragati Prakashan Meerut).
2. Sharma Saroj, "Physics Experiments for Engineers" (Oscar publications, New Delhi).
3. Singh, Devraj, "Engineering Physics" (Dhanpat Rai & Co., New Delhi).
4. Thiruvadigal, J. D., Ponnusamy, S., Sudha, D and Krishnamohan M., "Physics for Technologists" (Vibrant Publication, Chennai).
5. Shukla R. K., and Srivastava Anchal, "Practical Physics", (New Age International (P) Ltd, New Delhi).
6. Arora C.L., "B.Sc. Practical Physics" (S. Chand & Company Limited).
7. Souires G. L., "Practical Physics" (Cambridge University, UK).
8. Chattopadhyay D., Rakshit P. C., and Saha B., "An Advanced Course in Practical Physics", (Books & Allied Ltd., Calcutta).



CENTRAL WORKSHOP
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL, SRINAGAR - 190006 (J&K)

Subject: Workshop Practice Code : WSP 100	Common Syllabus for B.Tech 1st & 2nd Semester of All Engineering Branches		Total Course Credits: 02			
Continuous assessments	Class Assessment	Major Exam	Contact Hours			
			L	T	P	TOTAL
[30 Marks]	[10 Marks]	[60 Marks]	0	0	5	5

COURSE OUTCOMES (COs)

- CO1:** Identify and apply relevant tools and techniques in various Machining Operations.
- CO2:** Introduce various joints, tools, operations and techniques in Welding and Sheet-Metal Shop.
- CO3:** Recognize and apply basic principles and techniques of Forging and Foundry Shop.
- CO4:** Study and practice of basic operations using different types of tools and fixtures in Carpentry and Fitting Shop.

SYLLABUS

Machining Trade: Machinist Trade & Turning Section (6 Hrs)

Theoretical Instructions: Safety Precautions, Introduction of machine tools such as lathe, drilling machine & other related metal cutting tools. Parts of lathe & basic metal cutting operations. Introduction of various types of cutting tools (Nomenclature) and their material

Practical Demonstrations: Demonstration on Lathe & basic operations such as drilling, facing, turning, taper turning, step turning, knurling, chamfering etc. Demonstration of basic measuring instruments.

Job No. 1: TO MANUFACTURE A JOB ON THE CENTRE LATHE AS PER GIVEN DRAWING.

Job No. 2: TO PERFORM ADDITIONAL OPERATIONS SUCH AS GROOVING, DRILLING, KNURLING on Job No. 1.

Sheet Metal & Spray-Painting Section (6 Hrs)

Theoretical Instructions: Safety precautions, brief introduction of sheet metal, various tools, joints & operations. Soldering, brazing, & shearing, Fluxes & their applications. Introduction of different machines and pattern development in detail. Brief description of paints & varnishes.

Practical Demonstrations: Demonstration of all basic hand tools & equipment's. Fabrication of simple joints and jobs. Preparation & painting of surfaces for varnish & painting etc.

Job No. 1: TO DEVELOP A CYLINDRICAL JOB.

Job No. 2: TO DEVELOP A SQUARE ELBOW WITH SOLDERING GAS PER THE DRAWING.

Fitting & Benchwork Section

(6 Hrs)

Theoretical Instructions: Safety precautions, introduction to fitting & bench work. Demonstration of basic hand tools, holding devices and basic fitting operations such as measuring, marking, filing, sawing, drilling, tapping, buffing.

Practical Demonstrations: Demonstration of all basic hand tools/ measuring tools & equipment's. Demonstration of simple operations such as marking, punching, filing, sawing, scrapping, drilling.

Job No. 1: TO FABRICATE A SQUARE PLATE OF MILD STEEL WORK PIECE 50X50X7mm.

Job No. 2: TO ASSEMBLE THE MILD STEEL WORK PIECE WITH SNAP FITTING. **(6 Hrs)**

Welding Section

(6 Hrs)

Theoretical Instructions: Safety Precautions, Introduction of welding processes like electric arc welding, Gas Welding, MIG Welding, TIG welding, Submerged arc welding & spot welding. Various Fluxes & electrodes used in welding. Introduction of ac & dc welding and its applications.

Practical Demonstrations: Demonstration of all basic tools & personal protective equipment's. Demonstration of different types of joints by using arc welding & gas welding etc.

Job No.1: TO MAKE A SINGLE-V BUTT JOINT OF MILD STEEL 80×50×8mm

Job No.2: TO MAKE A LAP JOINT OF MILD STEEL 85×35×6mm

Smithy & Forging Section

(6 Hrs)

Theoretical Instructions: Safety precautions, introduction of forging tools. Materials & their heat treatments. Description of all forging operations such as hand forging, upsetting, drawing & punching. Introduction of various forging methods. Comparison of hot & cold working.

Practical Demonstrations: Demonstration & practice of different smithy operations like forging, cutting, punching, bending etc. Demonstration & practice of MS rod into forged MS ring & octagonal cross section.

Job No. 1: TO PREPARE MS-SQUARE 20X20MM FROM MS ROUND BY USING DIFFERENT FORGING HAND TOOLS.

Job No. 2: TO PREPARE A SQUARE HEADED BOLT FROM MS-ROUND 60×30mm

Carpentry & Pattern Making Section

(6 Hrs)

Theoretical Instructions: Safety Precautions, Introduction of carpentry & joinery, different tools used in carpentry. Seasoning of wood and defects of wood. Various types of joints. Brief description of wood working machines and patternmaking.

Practical Demonstrations: Demonstration & practice of different carpentry operation like Planning, sawing & chiselling and joints. Demonstration of pattern making tools & materials.

Job No. 1: TO PREPARE HALF LAP CROSS JOINT.

Job No. 2: TO PREPARE A BRIDLE JOINT.

List of recommended books: -

- 1) Workshop Technology by Chapman.
- 2) Workshop Technology by Hajra Chowdhary
- 3) Workshop Technology by Swarn Singh
- 4) Workshop Technology by Virender Narula



Syllabus for B. Tech Semester 2

DEPARTMENT OF HUMANITIES, SOCIAL SCIENCES & MANAGEMENT
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Advanced English Communication Skills & Organizational Behaviour Code: HUL101	Common Syllabus of B. Tech. 2nd Semester for All Engineering Branches		Total Course Credits: 03			
Mid-Term	Internal Assessment	Major Exam	Contact Hours			
			L	T	P	Total
[30 Marks]	[10 Marks]	[60 Marks]	2	1	0	3

Course Outcomes (COs)

CO1: Identify an author's purpose and tone; summarize and paraphrase information in a text.

CO2: Recognize and rectify common errors in grammar; appropriately use punctuations, modals, and active and passive voice in sentences.

CO3: Write academic essays, formal reports, emails, job cover letters, and résumés.

CO4: Demonstrate effective oral communication skills in social and academic contexts.

Syllabus

Unit I

Advanced Reading and Comprehension Skills

1. Intensive and extensive reading

Essay 1: What Should You Be Eating? + Supplementary Reading Passages

2. Improving Comprehension skills, techniques for good comprehension

Essay 2: How a Chinese Billionaire Build Her Fortune + Supplementary Reading Passages

Unit II

Grammar

1. Common errors in Grammar
2. Punctuation
3. Use of modals
4. Active and Passive Voice

Unit III

Academic and research writing skills

1. Introduction to Academic and Research writing.
2. Precautions in Academic and research writing.
3. Report writing: Steps in report writing; Types of reports, business and technical reports.
4. Referencing styles (APA and MLA Styles)

Unit IV

Successful job-application and project-proposal writing

1. Professional email writing.
2. Structure and content of Job Cover letters.
3. Structure and contents of Résumé.
4. Essentials of a successful project proposal.

Unit V

Advanced Presentation and Speaking Skills

1. Body Language and Barriers to Communication
2. Greetings, Introductions, Small Talks
3. Expressing Opinions, Agreement and Disagreement.
4. Group discussions and job interviews.

Unit VI

Organization

1. Organization: Introduction, definition, need and importance, principles and process of organizing
2. Organizational structure and its types, span of control, authority, Centralization and decentralization of authority.

Unit VII

Organizational Behavior

1. Organizational Behavior: Introduction, definition, goals and importance of OB, approaches to OB and its relevance in today's Business Environment.
2. Meaning and Concept of Motivation, Types and theories of Motivation, Personality, Leadership and Interpersonal Skills.

Text Book:

1. English for Engineers. By N. P. Sudharshana and C. Savitha. Cambridge University Press, 2018.

Reference Books:

2. Oxford Guide to Effective Writing and Speaking Skills. By John Seely. Oxford University Press, Indian Edition, 2008.
3. Professional Speaking Skills. By Aruna Koneru. Oxford University Press, 2015.
4. Intermediate English Grammar: Reference and Practice for South Asian Students. By Raymond Murphy. Cambridge University Press, 1994.
5. Organisational Behaviour. By Robins. Prentice Hall.
6. Organisational behaviour. By Fred Luthans. McGraw Hill
7. Leadership for Engineers: The Magic Mindset. By George Runcie. McGraw Hill Higher Education.

Books for supplementary readings:

1. Robins. P. S, Judge. A. T and Vohra. N, 2017 “Organisational Behaviour”, Pearson. Rs. 500
2. Khanka. S. S, 2006 “Organisational Behaviour” S Chand Rs. 499
3. Sing. C and Khatri. A, 2016, “Principle and practices of management and Organizational Behavior” Rs. 450
4. North house. G. P, 2014, “Leadership: Theory and Practices”, Sage Publications India ltd Rs.509



DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Basic Electrical Engineering (EEL 101)	Syllabus for B. Tech: 1stYear (2nd Sem) CIV/MECH/MET/CHEM		Total Course Credit:4		
	Spring 2020		Contact Hour		
Mid-Term*	End -Term*	L	T	P	
40 (Marks)	60 (Marks)	3	1	0	

Course Outcomes (COs): Upon successful completion of the course, student should be able to:

CO1: Analyze the behavior of different electric circuit parameters and have a thorough understanding of different types of energy sources.

CO2: Analyze the different configurations of DC circuits using basic circuit laws like KVL, KCL and tools like mesh analysis and nodal analysis.

CO3: Apply network analysis theorems like Superposition theorem, Thevenin's theorem, Norton's theorem and Maximum Power Transfer theorem to DC circuits and networks.

CO4: Use phasor representation for steady state analysis of sinusoidally excited AC circuits and understand the concept of active, reactive power and power factor correction in AC circuits.

CO5: Understand the working and application of DC and AC electric machines, and transformers.

Syllabus:

UNIT-I	Basic Concepts and Electric Circuit Parameters: Review of electric circuit concepts, terminology, basic laws, and electric circuit parameters. ENERGY SOURCES: Ideal and practical voltage and current sources and their transformation, Independent and dependent sources.
UNIT-II	D.C. Circuit Analysis: Power and energy relations, Analysis of series parallel D.C. Circuits, Loop and nodal methods of analysis, Delta-star(Δ -Y) transformation, Superposition theorem, Thevenin's and Norton's theorems, Maximum power transfer theorem.
UNIT-III	Sinusoidal Steady State Analysis of AC Circuits: Basic terminology and definitions, Phasor and complex number representation solutions of sinusoidally excited AC circuits, Power and energy relations in A.C. circuits, Applications of network theorems to A.C. circuits, Resonance in series and parallel circuits.
UNIT-IV	AC Power Analysis: Power and energy relations in AC circuits, Instantaneous power and apparent power, Average power, Concept of power factor, Active and reactive power, Complex power, Maximum power transfer theorem, Power factor corrections.
UNIT-V	Electric Machines and Transformers: Principle of operation, Construction and working of i) DC machines ii) AC machines iii) Single phase transformers.

DEPARTMENT OF MATHEMATICS
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Mathematics II Code: MAL 101	Common Syllabus for B.Tech. 2nd Semester of All Engineering Branches		Total Course Credits: 04			
Mid-Term	Class Assessment	Major Exam	Contact Hours			
			L	T	P	Total
[30 Marks]	[10 Marks]	[60 Marks]	3	1	0	4

COURSE OUTCOMES: At the end of the course, a student should be able to:

CO1: Solve problems related to Matrix theory

CO2: Solve partial differential equations by various methods.

CO3: Expand functions in terms of Fourier series.

CO4: Apply partial differential equations for solving problems of vibration of a stretched flexible string, Heat flow equation, Wave equation,

CO5: Solve problems related to surface and volume integrals.

Unit I

Linear Algebra: Rank of a matrix, Equivalent matrices, elementary transformations, Cayley-Hamilton theorem and Inverse of a matrix, Solution of simultaneous equations by elementary operations, normal form, Eigen values and Eigen vectors of a matrix, Quadratic forms. **(12 Hours)**

Unit II

Partial Differential Equations: Formation of PDE, Lagrange's linear equations, Partial differential equations of first order, Standard forms, Partial differential equations of second and higher order, Homogeneous partial differential linear equations with constant coefficients, Non-homogeneous linear partial differential equations. **(12 Hours)**

Unit III

Fourier series: Periodic function, Fourier series, Dirichlet's condition for a Fourier series, Euler's formulae, Functions having points of discontinuity, functions having arbitrary period, even and odd functions, Half range series. **(6 Hours)**

Unit IV

Applications of partial differential equations: Vibration of a stretched flexible string, Heat flow equation, Wave equation, Solution by the methods of separation of variables. **(6 Hours)**

Unit V

Integral Calculus: Beta & Gamma functions (definition & related problems), differentiation under integral sign – Leibnitz rule. Double & Triple integrals, Change of Variables in double integrals, Computation of surfaces & volumes, Rectifications, Jacobians of Transformations. (10 Hours)

TEXTBOOKS:

1. H. T. H Piaggio, Differential Equations and its applications, Orient Longman Limited.
2. S. Narayan, Integral Calculus.
3. S.C. Malik and S. Arora, Mathematical Analysis, New Age International Limited.
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DEPARTMENT OF ELECTRICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY SRINAGAR
HAZRATBAL SRINAGAR KASHMIR – 190006 (J&K)

Subject: Basic Electrical Engineering Laboratory (EEP 100)	Syllabus for B. Tech: 1st Year (2nd Sem) CIV/MECH/MET/CHEM Spring 2020	Total Course Credit:1		
		Contact hour		
Continues Assessment	Major Exam	L	T	P
40 (Marks)	60 (Marks)	0	0	2

Course Outcomes (COs): Upon successful completion of the course, student should be able to do:

- CO1 Verify and analyze the basic elements of electrical networks.
- CO2 Experimental study of KCL, KVL, Star-Delta transformation and theorems
- CO3 Experimental study of behaviors of Resistance, Inductance, Capacitance and their combinatory circuits.
- CO4 Experimental study of power and power factor, and Realization of power and voltage waveforms.

List of Experiments:

1	To study the colour coding of resistors
2	Connection of Ammeters, Voltmeters, Wattmeters and multi-meters in DC and AC circuits and selection of their ranges.
3	To study the series / parallel operation of resistors and verifying their effective values by LCR Q-meter.
4	To verify the KVL and KCL in DC circuits.
5	To verify the star delta transformation of networks.
6	To verify the star delta transformation of networks.
7	To verify the superposition theorem.
8	To verify the maximum power transfer theorem
9	Basic R, L, C circuits excited from A.C
10	To measure electric power in single-phase AC circuits with resistive load, RL load and RLC load
11	To study the series resonance
12	To study the parallel resonance.
13	To measure the power and power factor in three phase AC circuits.
14	To study the handling of CRO and use it for the study of different voltage waveforms.