(Session 2009-2010)

Scheme and Syllabi

for

B. Tech. & B. Arch.

1st Year

(1st & 2nd Semesters)

National Institute of Technology

Hamirpur - 177 005 Himachal Pradesh (INDIA)

(An Institute of National Importance)

Established under NIT act 2007

http://www.nitham.ac.in

OUR VISION

To build a vibrant multicultural learning environment founded on value based academic principles, wherein all involved shall contribute effectively, efficiently and responsibly to the nation and globalcommunity.

National Institute of Technology

Hamirpur - 177 005 Himachal Pradesh (INDIA)

DIRECTOR'S MESSAGE

I heartily welcome and congratulate all new entrant students for selecting NIT, Hamirpur for getting admission in the academic session 2009-2010 in various disciplines of technical education at this institute. You are lucky to have chosen this institution as it has been rated (by the World Bank) one of the best performing Institution of the country.

In last couple of years, NIT, Hamirpur has registered a tremendous progress in all the spheres, be it teaching-learning processes, R & D, continuing education, community development, consultancy, etc. Today, NIT Hamirpur has established itself prominently as one of the leading centers of learning and research at National as well as International level. I fell proud to apprise that many of the targets were achieved well before time. It is my pleasure to bring to your kind notice that NIT Hamirpur has made concerted efforts to contribute to the growth of knowledge. The Institute is handling about two-dozen research projects sanctioned by various funding agencies such as UGC, CSIR, MHRD, DST and other agencies. This institute provides various scholarships through various agencies to the students as per norms of providing agencies. The institute has formulated a 15 years road map enshrining our goals.

I also would like to bring to the notice of the all, that the institution makes all efforts to keep the campus a ragging free one. In case any student is found involved in ragging of any form he/she will be summarily terminated from the institute. I hope that you will spend your valuable time in shaping your career and uphold the values of the institution. It is also my sincere advice to you that at this stage of life you need to nurture good values and habits, have a positive attitude, imbibe the spirit of service to humanity and nation and be a good human being, I am sure you will realize your responsibility shortly. You must work for a better world after graduating from this institute and demonstrate to others the qualities you imbibed at this institute.

This booklet gives you most of the information that you may need in the first year and I congratulate Dr. Sunil of Applied Mathematics Department, for compiling the same and bringing it to you in this form. In case you need any additional information please feel free to talk to your concerned faculty member/officer who will be ready to help you at all times. .

Finally, I once again extend my good wishes to all new entrants for their bright and prosperous future.

Prof. I.K. Bhat

INTRODUCTION

The objectives of the undergraduate programmes at National Institute of Technology, Hamirpur (NIT Hamirpur) are:

- *to provide the highest level of education in technology and science and to produce competent, creative and imaginative engineers and scientists*
- *to be a role model of educational institutions in the Country*
- *to promote a spirit of free and objective enquiry in different fields of knowledge*
- *to make a significant contribution towards the development of skilled technical manpower, and*
- *to create an intellectual reservoir to meet the growing demands of the nation.*

The undergraduate programmes are designed to achieve these objectives and to inculcate in the students concept of intellectual skills, courage and integrity, awareness and sensitivity to the needs and aspirations of the society.

Main Features of Under Graduate Programme

ACADEMIC SESSION

The academic session normally begins in the last week of July and ends in first week of May. It is divided into two parts.

First Semester: From the last week of July to first week of December.

Second Semester: From the last week of December to First week of May.

EVALUATION SYSTEM

The evaluation of students in a course is a continuous process and is based on their performance in different examinations/tests as mentioned below:

(a) Theory Courses

(i) Continuous Assessment Examinations (CAE) carrying 50% weightage.

(ii) End Term Examination (ETE) carrying 50% weightage.

(b) Laboratory Courses

(i) Continuous Assessment Examinations (CAE) carrying 60% weightage.

(ii) End Term Examination (ETE) carrying 40% weightage.

Continuous Assessment Examinations (CAE) for Theory Courses (Weightage 50%)

The Continuous Assessment Examinations shall be conducted as per the notification in the academic calendar. However, quizzes/ class tests/ MCQ tests/ Open book tests/ Group activities can be conducted by the teacher during the semester as per his/her course plan. The distribution given to each component during Continuous Assessment Examination for theory courses is given below:

Distribution of Weightage for Theory Courses (Weightage 50%)

S.No.	Particulars	Weightage (%)
1.	1st Periodical Examination 2nd Periodical Examination	15% 15%
2.	Assignments/ Tutorials/ Class Performance/ Quizzes/ Projects etc.	20%

Duration of periodical examination shall be of one and half hour. The question paper shall consist of both objective (Multiple Choice/ Fill in the blank/ True and False) as well as subjective questions.

End Term Examination (ETE) for Theory Courses (Weightage 50%)

There will be an End Term Examination at the end of each semester for three hour duration for each course and it is mandatory for a student to appear in End Term Examination. The question paper shall consist of both objective (Multiple Choice/ Fill in the blank/ True and False) as well as subjective questions covering entire syllabus of a course.

Evaluation for Laboratory Courses

For the laboratory and practical works, the continuous assessment and end term examination, marks distribution shall be as given:

Distribution of Weightage for Laboratory Courses

Continuous Assessment		**End Term (Lab final)**	
Components	**Weightage**	**Components**	**Weightage**
Record Mark (based on continuous assessment of Lab/Practical works considering regularity and timely submission of lab records)	20%	Lab experiment/ Procedure writing/ Tabulation/ Innovation etc. as applicable	20%
Viva-Voce	40%	Viva -Voce	20%
Total	**60%**	**Total**	**40%**

GRADING SYSTEM

***The institute will follow relative grading system*.**

Grades and Grade Points

At the end of the semester a student is awarded a letter grade in each of his/her courses by the concerned Faculty-in-Charge taking into account his/her performance in the various examinations, quizzes, assignments, laboratory work (if any), etc., besides regularity of attendance in classes.

There are seven letter grades: A, AB, B, BC, C, D, and F. The letter grades and their numerical equivalents on a 10-point scale (called Grade Points) are as follows:

Letter Grade	**A**	**AB**	**B**	**BC**	**C**	**D**	**F**
Grade Points	**10**	**9**	**8**	**7**	**6**	**4**	**0**

In addition, there are three letter grades, viz., I, S and X, which stand for Incomplete, Satisfactory and Unsatisfactory, respectively. Further, for courses with zero weightage (Audit) only Pass (P) / Fail (F) grades are awarded.

In case a student repeats a particular course during summer term or along with his/her juniors, he/she will be awarded only up to a maximum of B grade as per his/her performance and with respect to his/her earlier class. F – grade is a fail grade. The course(s) in which a student has earned F-grade will be termed as back-log course(s).

SEMESTER GRADE POINT INDEX (SGPI)

The Semester Grade Point Index (SGPI) is a weighted average of the grade points earned by a student in all the courses credited and describes his/her academic performance in a semester. If the grade points associated with the letter grades awarded to a student are g_1, g_2, g_3, g_4 and g_5, in five courses and the corresponding weightages (credits) are w_1, w_2, w_3, w_4 and w_5, then the SGPI is given by:

$$\text{SGPI} = \frac{w_1 g_1 + w_2 g_2 + w_3 g_3 + w_4 g_4 + w_5 g_5}{w_1 + w_2 + w_3 + w_4 + w_5}$$

S and X grades shall not be considered in the computation of the SGPI. Similarly, Pass (P) and Fail (F) grades awarded for courses of zero weightage shall not be considered in the computation of SGPI.

CUMULATIVE GRADE POINT INDEX (CGPI)

The Cumulative Grade Point Index (CGPI) indicates the overall academic performance of a student in all the courses registered up to and including the latest completed semester. It is computed in the same manner as the SGPI, considering all the courses (say, n), and is given by:

$$\text{CGPI} = \frac{\sum_{i=1}^{n} w_i g_i}{\sum_{i=1}^{n} w_i}$$

Whenever a student is permitted to repeat or improve a course, the new letter grade replaces the old letter grade in the computation of the CGPI.

*A student will be declared **Fail** in a semester if he/she obtains **SGPI < 4** or **CGPI < 4.5**. He/she will have to repeat that semester subsequently. He/she will not be allowed to move to higher semester without clearing that semester as well as obtaining the required minimum SGPI (4.5) and CGPI (5.0).*

INADEQUATE ACADEMIC PERFORMANCE

The academic performance of each undergraduate student is reviewed by APEC at the end of a regular semester and is considered inadequate if his/her SGPI/CGPI is as under:

$$4 \le \text{SGPI} < 4.5 \text{ or } 4.5 \le \text{CGPI} < 5.0$$

Such a student is termed 'academically deficient'. Depending on the degree of inadequacy, a deficient student may be placed on ***warning*** or ***Academic Probation. The HOD of concerned department will issue the warning.***

A student shall not be allowed to register in the fifth semester if he/she has a backlog of first semester. Similarly he/she shall not be allowed to register in the subsequent sixth, seventh and eighth semester if he/she has a backlog of second, third and fourth semesters respectively. Similarly, in case of B.Arch., students shall not be allowed to register in fifth, sixth, seventh, eighth, ninth and tenth semester, if they have a backlog of first, second, third, fourth, fifth and sixth semester, respectively.

ACADEMIC PROBATION

A student is put on **academic probation** [UG manual, clause no.7.1] if his/her SGPI or CGPI is as under

$$4 \le \text{SGPI} < 4.5 \text{ or } 4.5 \le \text{CGPI} < 5.0$$

Such a student is required to sign an undertaking incorporating the following terms and conditions:

- **(i)** I shall attend at least 75% of all lecture, tutorial and laboratory classes of each course.
- **(ii)** I shall register for all courses (if available) in which the letter grade F is obtained during summer.
- **(iii)** I shall, in addition, repeat those courses (if available) in which the letter grade D is secured if my CGPI/SGPI drops below the prescribed minimum (5.0 & 4.5) respectively and I shall improve above prescribed minimum by crediting courses in which I have got D grade.

(iv) I shall obtain a minimum SGPI of 4.5 and CGPI of 5.0, in future.

(v) I shall not hold any office in the Hostels, Students Club/Gymkhana or any other organization/body during academic probation.

(vi) I shall not participate in any mass bunk from classes during academic probation.

(vii) If I don't fulfil the requisite academic performance condition (SGPI $\geq$4.5 and CGPI $\geq$5.0) in this semester then I shall automatically be deemed to have failed in the semester and will have to repeat the whole semester within the total duration of course.

In summer, a student can registered for a maximum three courses. A summer term course is open only to those students who had taken the course earlier and secured F grade and/or secured D grade subject to the condition that SGPI<4.5 or CGPI< 5.0.

ATTENDANCE REQUIREMENT

Being residential institute all the students are normally required to have full (100%) attendance. However, in no case it should be less then 75% even after giving the attendance benefits because of illness, participation in sports and cultural activities, NCC, NSS, Mountaineering, skiing course/competitive examination or and any other genuine ground. Candidates having attendance less than 75% shall **not** be allowed to appear in the examination and will be awarded F grade.

LEAVE OF ABSENCE

Application for leave of absence should be forwarded to HOD/DUGC through the convener DUGC with a medical certificate from the Institute Health Centre/Medical Officer of the Govt. Hospital along with prescription slip (if applicable). Leave must not usually be availed of without prior approval of the convener DUGC.

SHORT LEAVE

Leave of absence during the semester shall be discouraged for all registered students. However, for bonafide reasons, a student may be granted leave of absence during the semester by convener DUGC as under:

Maximum of 15 days – on medical grounds

Maximum of 7 days – for any valid reason

However, the attendance should not fall below 75% of the total lectures delivered (including tutorials) and lab sessions for practical subjects.

ACADEMIC PERFORMANCE REQUIREMENT

A student is required to complete successfully all the courses of the curriculum prescribed for his/her *undergraduate* programme and attain a minimum level of academic performance, i.e., obtain a minimum CGPI **5.0.**

CHANGE OF BRANCH

(a) The students shall normally pursue the respective B. Tech. programmes allocated to them at the time of admission. However, the Senate may permit a limited number of academically meritorious students, as assessed by their performance in the Institute for at least two regular semesters, to change their branch as per the guidelines given below:-

(i) Change of branch in the beginning of the 3rd semester, shall be allowed on merit basis from amongst the students;

Who have completed all the common course credits required in the first two semesters of their studies, in their first attempt.

(ii) Who have obtained CGPI of not less than 7.5 (for General Category Students) and 6.5 (for SC/ST students) at the end of the second semester.

(iii) Students who have taken re-admission in 1st semester after seeking temporary withdrawal will not be considered for branch change in 3rd semester (2nd year).

(b) Application for a change of branch must be made by all eligible students in the prescribed form. The Dean (Academic) will call for applications at the beginning of 3rd semester of each academic year and completed forms must be submitted by the last date specified in the notification.

(c) Students may enlist up to three choices of branch, in order of preference, to which they wish to change over. It will not be permissible to alter the choice after the application has been submitted.

(d) Change of the discipline will be permitted strictly in the order of merit as determined by their CGPI at the end of first year subject to the limitation that the actual number of students in the third semester in the discipline to which the transfer is to be made, should not exceed the sanctioned strength and the strength of the discipline from which transfer is being sought does not fall below 75% of sanctioned strength.

(e) Change of branch will be allowed against the vacant seats in particular branch strictly in order of inter-se-merit, subject to the condition that change so allowed shall not exceed sanctioned strength of that discipline.

(f) For a student with CGPI 9.5 or above if a vacancy does not exist, he/she will be permitted to change provided the strength in the discipline to which the change is being sought does not exceed by 5% of the approved strength. These seats will be super numerary.

i) The change of branch shall be made in accordance with the above rules and shall be effected in the beginning of 2nd year (3rd semester). After this no change of branch shall be permitted.

(j) All changes of branch will be final and binding on the applicants. No student will be permitted, under any circumstances, to refuse the change offered.

The change of branch clause will not be applicable to B.Arch. students.

MIGRATION

Migration from and to other institution/University shall not be permitted in between the course studies.

CODE OF CONDUCT

Each student shall conduct himself/herself in a manner befitting his/her association with an Institute of National Importance. He/she is expected not to indulge in any activity, which is likely to bring down the prestige of the Institute. He/She should also show due respect and courtesy to the teachers, administrators, officers and employees of the Institute, and good neighbourly behaviour to fellow students. Due attention and courtesy is to be paid to visitors to the Institute and residents of the Campus.

UNDERGRADUATE PROGRAMMES

1. Bachelor of Technology (B. Tech.) – 4 year programmes (8 Semesters)

(i) Civil Engineering (CE)

(ii) Computer Science and Engineering (CSE)

(iii) Electrical & Electronics Engineering (EEE)

(iv) Electronics and Communication Engineering(ECE)

(v) Mechanical Engineering (ME)

(a) Group-A

Section A: Electrical and Electronics Engineering (EEE)

Section B: Electronics and Communication Engineering (ECE)

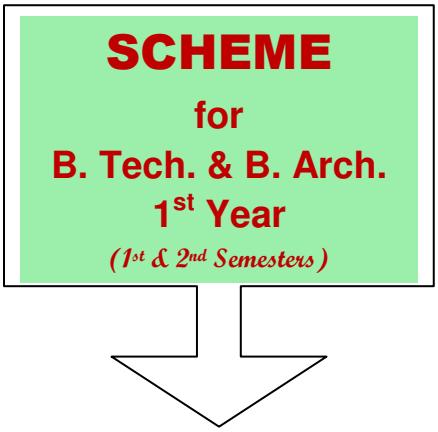
Section C: Computer Science and Engineering (CSE)

(b) Group-B

Section D: Civil Engineering (CE)

Section E: Mechanical Engineering (ME)

2. Bachelor of Architecture (B. Arch.) - 5 year programme (10 Semesters)



Scheme for B. Tech., 1st Semester

Group-A

Sr. No.	Course No.	Title of the course	L	T	P	Credits
1.	BS-111	Engineering Mathematics-I	3	1	0	4
2.	BS-104	Engineering Physics	3	1	-	4
3.	TA-102	Computer Fundamentals & Programming	3	1	-	4
4.	HU-101	Communication Skills	2	1	-	3
5.	ES-101	Engineering Mechanics and Strength of Materials	4	2	0	5
6.	ES-102	Basic Electrical Engineering	3	1	-	4
7.	BS-104(P)	Engineering Physics Lab	0	0	2	1
8.	TA-102(P)	Computer Fundamentals & Programming Lab	0	0	2	1
9.	HU-101(P)	Communication Skills Lab	0	0	2	1
10.	ES-102(P)	Basic Electrical Engineering Lab	0	0	2	1

11.	WP-111	Workshop-I	1 0 3	3
			Total = 37	**31**

Group-B

Sr. No.	Course No.	Title of the course	L T P	Credits
1.	BS-111	Engineering Mathematics-I	3 1 0	4
2.	BS-103	Engineering Chemistry	3 1 -	4
3.	BS-105	Material Science	3 1 -	4
4.	ES-103	Basic Electronics Engineering	3 1 -	4
5.	ES-104	Basic Thermodynamics	3 1 0	4
6.	TA-101	Engineering Graphics	1 0 4	3
7.	BS-103(P)	Engineering Chemistry Lab	0 0 3	2
8.	BS-105(P)	Material Science Lab	0 0 2	1
9.	ES-103(P)	Basic Electronics Engineering Lab	0 0 2	1
10.	WP-122	Workshop-II	1 0 3	3
			Total = 36	**30**

Scheme for B. Arch., 1st Semester

Sr. No.	Course No.	Title of the course	L T P D	Credits
1.	AR-111	Architectural Design-I	2 0 0 6	5
2.	AR-112	Building Constr. & Materials-I	2 0 1 3	4
3.	AR-113	History of Architecture-I	3 1 0 0	4
4.	AR-114	Structure-I	2 1 0 0	3
5.	BS-111	Engineering Mathematics-I	3 1 0 0	4
6.	HU-101	Communication Skills	2 1 0 0	3
7.	HU-101(P)	Communication Skills Lab	0 0 2 0	2
8.	TA-101	Engineering Graphics	1 0 4 0	3
			Total = 35	**28**

Scheme for B. Tech., 2nd Semester

Group-A

Sr. No.	Course No.	Title of the course	L T P	Credits
1.	BS-122	Engineering Mathematics-II	3 1 0	4
2.	BS-103	Engineering Chemistry	3 1 -	4
3.	BS-105	Material Science	3 1 -	4
4.	ES-103	Basic Electronics Engineering	3 1 -	4
5.	ES-104	Basic Thermodynamics	3 1 0	4
6.	TA-101	Engineering Graphics	1 0 4	3
7.	BS-103(P)	Engineering Chemistry Lab	0 0 3	2
8.	BS-105(P)	Material Science Lab	0 0 2	1
9.	ES-103(P)	Basic Electronics Engineering Lab	0 0 2	1
10.	WP-122	Workshop-II	1 0 3	3
			Total = 36	**30**

Group-B				
Sr. No.	**Course No.**	**Title of the course**	**L T P**	**Credits**
1.	BS-122	Engineering Mathematics-II	3 1 0	4
2.	BS-104	Engineering Physics	3 1 -	4
3.	TA-102	Computer Fundamentals & Programming	3 1 -	4
4.	HU-101	Communication Skills	2 1 -	3
5.	ES-101	Engineering Mechanics and Strength of Materials	4 2 0	5
6.	ES-102	Basic Electrical Engineering	3 1 -	4
7.	BS-104(P)	Engineering Physics Lab	0 0 2	1
8.	TA-102(P)	Computer Fundamentals & Programming Lab	0 0 2	1
9.	HU-101(P)	Communication Skills Lab	0 0 2	1
10.	ES-102(P)	Basic Electrical Engineering Lab	0 0 2	1
11.	WP-111	Workshop-I	1 0 3	3
			Total = 37	**31**

Scheme for B. Arch., 2nd Semester

Sr. No.	**Course No.**	**Title of the course**	**L T P D**	**Credits**
1.	AR-121	Architectural Design-II	2 0 0 8	6
2.	AR-122	Building Constr. & Materials-II	2 0 0 4	4
3.	AR-123	History of Architecture-II	3 1 0 0	4
4.	AR-124	Structure-II	2 1 0 0	3
5.	AR-125	Architectural Drawing & Graphics-I	2 0 0 4	4
6.	TA-102	Computer Fundamentals & Programming	3 1 0 0	4
7.	TA-102(P)	Computer Fundamentals & Programming Lab	0 0 2 0	2
			Total = 35	**27**

Dress code: White apron for Engineering Chemistry lab and Khaki uniform for Workshops-I & II.

SYLLABI

for

B. Tech. & B. Arch.

1st Year

(1st & 2nd Semesters)

ENGINEERING MATHEMATICS-I [BS-111]

L T P

3 1 0

1. 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 (Radical 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.

2. DIFFERENTIAL CALCULUS

Partial Differentiation and its geometrical interpretation, Homogeneous functions, Euler's theorem and its extension, Total differentials, Composite function, Jacobian, Taylor's and Maclaurin's infinite series, Errors and increments, Introduction to limits and Indeterminate forms, Maxima and minima of functions of two variables, Method of undetermined multipliers. Curve tracing (Cissiod, Astroid, Cycloid, Folium of Descartes', Cardiod and Equiangular spiral).

3. INTEGRAL CALCULUS

Quadrature, Rectification, Surface and Volume of revolution for simple curves, Double integrals and their applications, Change of order of integration, Triple integrals and their applications, Change of variables.

4. VECTOR CALCULUS

Differentiation of vectors, Curves in space, Velocity and acceleration, Relative velocity and acceleration, Scalar and vector point functions, Vector operator del, gradient, divergence and curl with their physical interpretations, Formulae involving gradient, divergence and curl, Line, surface and volume integrals, Theorems of Green, Stokes and Gauss (without proofs) and their verifications and applications, Irrotational and Solenoidal fields.

TEXT BOOKS

1. Advanced Engineering Mathematics: by Erwin Kreyszig, John Wiley and Sons, NC, New York.
2. Advanced Engineering Mathematics: by R. K. Jain & S. R. K Iyengar, Narosa Pub. House.

REFERENCE BOOKS

1. Advanced Engineering Mathematics: by C. R. Wylie & L. C. Barrett, McGraw Hill.
2. Differential & Integral Calculus: by N. Piskunov, MIR Publications.

ENGINEERING PHYSICS [BS-104]

L T P

3 1 0

1. LASERS

Concept of maser and laser, spontaneous and stimulated emission, elementary idea about lasers, basic principles involved in laser, three and four level laser system, coherence, characteristics of laser light, types of lasers: Ruby, He-Ne, CO2 and semiconductor lasers, application of lasers.

2. FIBER OPTICS

Optical fiber, physical structure and basic theory, modes in optical fibers, step index and graded index fibers, losses in optical fibers, sources and sensors for optical fibers, applications of optical fibers in communication.

3. ELECTROSTATICS AND ELECTRODYNAMICS

Gauss's law in dielectric medium, Equation of continuity, displacement currents, Maxwell's equations, wave equation for electromagnetic radiation, electromagnetic wave propagation in free space and isotropic dielectric medium, Poynting theorem & Poynting vector, Vector potential.

4. MECHANICS AND THEORY OF RELATIVITY

Displacement, velocity and acceleration in polar and spherical coordinate systems, inertial and non-inertial frames, Michelson and Morley experiment, postulates of special theory of relativity, Lorentz's space - time transformations and their consequences, velocity transformations, mass variation with velocity, mass energy equivalence, momentum and energy transformations.

5. QUANTUM MECHANICS

Need of quantum mechanics, Compton effect, Born's concept of wave function, eigen function and eigen values, operators in quantum mechanics, expectation values, time independent and time - dependent Schrodinger's wave equations and its applications viz., particle in one dimensional potential well, particle in three dimensional well, rectangular potential barrier, quantum mechanical tunneling and its applications.

6. SUPERCONDUCTIVITY

Introduction and discovery of superconductivity, superconducting materials, Meissner effect, critical magnetic field and critical current, type-I and type-II superconductors, Isotope effect, theory of superconductivity, flux quantization, SQUIDS, applications of superconductivity.

7. ULTRASONICS

Ultrasonic waves, methods of their generation & detection, properties and applications of ultrasonic waves.

TEXT BOOKS

1. A Text Book of Engineering Physics: by M. N. Avadhanulu and P. G. Kashirsagar, S. Chand & Co. Ltd.
2. Engineering Physics: by Satya Prakash and Vibhav Saluja, Pragati Prakashan, Meerut
3. Modern Engineering Physics: by A. S. Vasudeva, S. Chand & Co. Ltd.

REFERENCE BOOKS

1. Optical Electronics: by AK Ghatak and Thyagarajan, Foundation Books, New Delhi.
2. Electromagnetic Theory and Electrodynamics: by Satya Prakash, Pragati Prakashan, Meerut.
3. Introduction to Electrodynamics: by David J Griffiths, Prentice Hall of India, New Delhi.
4. Concepts of Modern Physics: by Arthur and Beiser, McGraw Hill Publication.
5. Optical Fibers Communication and Technology: by D.K. Mynbaev and L.L. Scheiner, Pearson Education.

COMPUTER FUNDAMENTALS AND PROGRAMMING (TA-102)

L	T	P
3	1	2

1. PROGRAMMING FUNDAMENTALS

Introduction to computer, block diagram and organization of computer, number system and binary arithmetic, processing data, hardware, software, firmware, types of programming language-Machine language, ALL, HLL, source file, object file, translators-assembler, compiler, interpreter, translation of source code into object code, library files, linking, loading process and executable code, testing and debugging, software maintenance, hardware maintenance.

2. PROGRAMMING TECHNIQUES

Steps in program development, algorithm, flowchart, psuedocode, evolution and classification of programming languages.

3. 'C' AS STRUCTURED PROGRAMMING LANGUAGE

(a) **'C'** character set, literals, keywords, identifiers, data types and size, variable declaration, expression, labels, statements, formatted input output statements, types of operators, data type conversion, mixed mode arithmetics, control structures.

(b) **'C'** functions, library functions, parameter passing, recursion, storage classes, scope rules and visibility, arrays –declaration, initialization and usage, pointers, dynamic storage allocation, structures and unions, self-referential structures.

(c) **'C'** files, function for file handling, 'C' pre-processors and command line arguments, macros and conditional compiler directives.

TEXT BOOKS

1. Computer Fundamentals: by P.K.Sinha.
2. Programming with C: by Byron Gott Fried, Tata McGraw Hill.
3. Let us C: by Yashwant Kanetkar, BPB Publications, New Delhi.

REFERENCE BOOKS

1. The Spirit of C: by Munish cooper, Jaico Books.
2. C Programming language: by Jernighan and Ritchie, Pretenice Hall of India.

COMMUNICATION SKILLS (HU-101)

L	T	P
2	1	2

COURSE OBJECTIVES

1. To increase student's ability to improve and utilize the skills necessary to be a competent interpersonal communicator.
2. To increase student's understanding of his or her own communication behavior.
3. To increase student's understanding of others communication behaviors.
4. To improve student's communication skills in both social and professional contexts.
5. To improve student's ability to demonstrate effective conflict resolution skills.

1. ESSENTIALS OF COMMUNICATION

The process of communication, Communication competence, Communication and self-concept, Personal SWOT Analysis, Role of emotion in communication, Interpersonal Communication, Nonverbal communication.

2. WRITTEN COMMUNICATION

Enriching vocabulary, Using vocabulary in different contexts, Essentials of strong writing skills, Language and style, Logical reasoning, Paragraph Writing, Developing perspective.

3. SPEAKING

Public speaking, Fear of Public speaking and remedies, Elocution, Extempore Speeches, Group Discussions, Multi-perspective debates, How to write and present papers.

4. READING COMPREHENSION

Precis Writing, Comprehension, Discussion on the basis of reading of novel/story.

5. TECHNICAL COMMUNICATION

Analyzing audience, Report Writing, Importance, structure, style and drafting of reports.

6. ASSIGNMENTS

1. Questionnaires/Surveys

You will be asked to complete questionnaires, Questionnaires are designed to assess your communication skills, You will be asked to write a review on each questionnaire assignment.

2. Self Concept Paper

A paper to assess your self concept (approximate length 5 pages).

3. Class Seminar

Extempore/Pre-decided.

4. Survey Report

TEXT BOOKS

1. An Approach to Communication Skills: by Indrajit Bhattacharya.
2. Business Correspondence and Report Writing: by R. C. Sharma & Krishna Mohan.
3. Technical Communication: by Meenakshi Raman and Sangeeta Sharma, Oxford.

REFERENCE BOOKS

1. Developing Communication Skills: by Krishna Mohan & Meera Bannerji.

ENGINEERING MECHANICS AND STRENGTH OF MATERIALS (ES-101)

L	T	P
4	2	0

1. FORCE, MOMENT, C. G & MOMENT OF INERTIA

Idealisation of Mechanics, Concept of Rigid Body and Elastic Body, Laws of Mechanics, Forces & System of Forces, Composition, Resolution & resultant of Forces, Laws of Forces, Lami's Theorem, Moment & Couples, Varignon's Theorem, Free Body Diagram, Centre of Gravity of a Lamina, Centroids of various Geometric Shapes, Moment of Inertia, Radius of Gyration, Parallel and Perpendicular Axis Theorem.

2. FRAMES AND TRUSSES

Introduction, Perfect Frame, Redundant Frame, Reactions of Supports, Plane Trusses, Space Trusses, Method of Joints, Method of Section, Graphical Method- Maxwell Diagram.

3. SHEAR FORCE AND BENDING MOMENT

Introduction, Types of Load – Concentrated, uniformly distributed, uniformly varying load and Combination of loads. Types of beams – Cantilever beam, simply supported beam, overhanging beam; Shear force and bending moment diagrams for the above beams with one type of loading and combination of loading. Point of contra flexure Relationship between load, Shear force and bending moment.

4. RECTILINEAR AND CURVILINEAR TRANSLATION

Kinematics and Kinetics of Rectilinear Motion, Differential Equation of Rectilinear Motion, Motion of a Particle acted upon by a constant and continuously varying Force, Impulse and Momentum, Work and Energy, Differential Equation of Curvilinear Motion, Moment of Momentum, Work and Energy in Curvilinear Motion, D'Alembert's Principle.

5. ROTATION OF A RIGID BODY ABOUT A FIXED AXIS

Kinematics of Rotation, Equation of Motion for a Rigid Body Rotating about a Fixed axis, Rotation under the Action of Constant Moment, Resultant, Inertia Force in Rotation, The Principle of Angular Momentum in Rotation, Energy Equation for Rotating Bodies.

6. PLAIN MOTION OF A RIGID BODY AND RELATIVE MOTION

Kinematics of Plain Motion, Instantaneous Centre, Equation of Plain Motion, D'Alembert's Principle in Plain Motion, Principle of Angular Momentum in Plain Motion, Energy Equation for Plain Motion, Kinematics of Relative Motion, Equation of Relative Motion, D'Alembert's Principle in Relative Motion.

7.SIMPLE STRESSES AND STRAINS

Stress & strain; Types of stresses and strains Elastic limit; Hooke's law; Stress – strain diagram for ductile and brittle material, Factor of safety; Poisson's Ratio; Elastic constants; Young's modulus, Shear modulus & Bulk modulus. Relationship between elastic constants-Derivation, Thermal Stress & Strain.

8.TORSION OF CIRCULAR SHAFT

Pure Torsion, Theory of Pure torsion, Derivation of Torsion equation for a circular shaft subject to torsion, assumptions, Maximum torque transmitted by a Solid shaft and hollow shaft-derivations, Polar modulus, torsion rigidity, Shear stress produced in the members, Comparison of hollow and solid shaft, Power transmitted by a shaft, Close coiled helical spring subjected to axial load and axial torque.

TEXT BOOKS

1. Engineering Mechanics: by Timoshenko & Young, Mc Graw Hill.
2. Applied Mechanics: by I B Prasad, Khanna Publishers. New Delhi.
3. Engineering Mechanics: by Bhavikatti & Rajshekhrappa.
4. Engineering Mechanics: by D. P. Mandal, SK Kataria & sons, Delhi.
5. Strength of Materials: by R.K.Bansal.
6. Strength of Materials: by Gupta &. Malhotra.
7. Strength of Materials: by Sadhu Singh.

REFERENCE BOOKS

1. Engineering Mechanics: by J.L. Meriam and L.G. Kraige, Wiley-India Ltd., New Delhi.
2. Engineering Mechanics: by Beer P Johnson.
3. Engineering Mechanics: by E. J. Hearn, Schaum Series Publications.
5. Engineering Mechanics: by R. K. Bansal, Luxmi Publications. Delhi.
6. Engineering Mechanics: by Basu, Tata Mc Graw Hill.

BASIC ELECTRICAL ENGINEERING (ES-102)

L T P

3 1 2

1. ELECTRIC CIRCUITS

Introduction to linear and non linear circuit, circuit elements, various sources and source transformation, solution of D.C. circuits using Kirchoff's laws, signal wave forms and passive elements specifications, generation of A.C. sinusoidal voltage and currents, average and r.m.s. values, Form factor and peak factor, phasor representation, phasor in polar, rectangular and exponential forms, terminal relationship for pure passive elements and their combination in series and parallel.

Analysis of single phase series, parallel and series-parallel circuits. Active and reactive power, p.f. and volt-ampares, frequency response and Q-factor. Analysis of balanced three phase a.c. circuits - Introductory concept, voltage, current and power in three phase balanced circuits. Introduction to Electric Wiring.

2. ELECTROMAGNETICS & TRANSFORMER

Magnetic circuit concept, B-H curves characteristics of magnetic materials, practical magnetic circuits, magnetic circuits with D.C. and A.C. excitation, hysteresis and eddy current losses. Principle of Transformer operation, construction & circuit of transformer.

Magnetic force, self and mutual inductances, Faraday`s laws, Lenz`s Law, statically and dynamically induced emfs, energy stored in magnetic fields.

3. MEASURING INSTRUMENTS

Introduction to galvanometer (Moving coil and moving iron) Ammeter, voltmeter, wattmeter, energy meter, use of shunt and multiplier.

4. ELECTRICAL MACHINES

Fundamentals of D.C. and A.C. machines.

BOOKS SUGGESTED

1. Electrical Technology: by H. Cotton (MKS Units).
2. Principle of Electrical Engineering: by Del Toro.
3. Basic Electrical Engineering: by Fitzgerald.
4. Electrical Estimating and Costing: by N Alagappan. Tata McGraw Hill, Delhi.

ENGINEERING PHYSICS LAB [BS-104(P)]

L	T	P
0	0	2

Experiment No.	Description of Experiment
1	To find the resistance of a given wire using a post office and hence to determine the specific resistance of the material of wire.
2	To find the area of the rectangle by using sextant.
3	To convert a Weston type galvanometer into a voltmeter of a given range 03 volt.
4	To verify inverse square law of magnetism using magnetometer.
5	To study the variation of magnetic field with distance along the area of circular coil carrying current.
6	To find the refractive index of material of given prism using a spectrometer.
7	To determine the wavelength of laser light using transmission grating.
8	To find the wavelength of sodium light by measuring the diameter of Newton ring.
9	To find the value of plank's constant and photo electric work faction of the material of the cathode using a photo electric cell.
10	To find the velocity of ultrasonic velocity in liquid with interferometer.
11.	To study the characteristics of Solar Cell.
12.	To find the numerical aperture of optical fiber.

COMPUTER FUNDAMENTALS AND PROGRAMMING [TA-102(P)]

L T P

0 0 2

Experiment No.	Description of Experiment
1	WAP to print name, roll no., branch and address.
2	WAP to use different arithmetic operators.
3	WAP to calculate the simple interest.
4	WAP to display the result of five subjects based on given condition.
5	WAP to calculate and display the roots of quadratic equation.
6	WAP to make use of switch-case statement.
7	WAP to print all the prime numbers up to n.
8	WAP to print the Fibonacci series.
9	WAP to print different patterns.
10	WAP to find whether a number is Armstrong or not.
11.	WAP to reverse the digits of an n-digit number.
12.	WAP to print the LSD and the second rightmost digit of a float number.
13.	WAP to convert a decimal number into binary.
14.	WAP to find the greatest and 2^{nd} greatest number among 10 numbers.
15.	WAP to sort given numbers in ascending or descending order.
16.	WAP to make use of different string functions.
17.	WAP to swap two numbers using call-by-value and call-by-reference method.
18.	WAP to find the factorial of a number without and with recursion.
19.	WAP to print Fibonacci series using recursion.
20.	WAP to add or subtract two multi-dimensional matrices.
21.	WAP to multiply two matrices.
22.	WAP to create and use the elements of a structure.
23.	WAP to use different file handling functions.

COMMUNICATION SKILLS LAB [HU-101(P)]

L T P

0 0 2

Experiment No.	Description of Experiment
1	Issues in English
2	Sky Pronunciation Suite
3	Business Writing
4	The Report Writer
5	Reactions
6	Author Plus
7	Error Terror
8	Power point presentation

BASIC ELECTRICAL ENGINEERING LAB [BS-102(P)]

L T P

0 0 2

Experiment No.	Description of Experiment
1	To verify ohm's law for BPLL element.
2	To find for a filament lamp (i) Variation of resistance with voltage. (ii) Variation of power with voltage.
3	To find minimum fusing current and fuse constant of a given fuse wire.
4	To calibrate a given voltmeter with the help of standard ammeter and resistance.
5	To calibrate a given ammeter with the help of standard voltmeter and resistance.
6	To find voltage current relationship in R-L series circuit and to determine power factor of the circuit.
7	To calibrate given wattmeter by direct loading.
8	To calibrate single phase energy meter by direct loading.
9	Verification of Kirchhoff's laws: (i) KVL (ii) KCL
10	Determination of inductance of a coil using voltmeter ammeter methods.
11.	To verify total resistance R of the series connected resistances R=R1+R2+R3.

WORKSHOP-I (WP-111)

L T P

1 0 3

1. CARPENTRY SHOP

Introduction, Common safty precautions in Carpentry Shop, Classification of Wood, Seasoning of Wood, Auxiliary materials used in Carpentry Shop. Common Hand tools and machines, various Carpentry joints, Wood working processes. Practice Jobs for various operations and joints (Edge Joint, Mortise and Tenon Joint, Bridle Joint)

2. FITTING SHOP

Introduction , classification of various types of tools, fitting operations, practice job for fitting to male and female parts on M.S. Flat Aluminium and acrylic sheet.

3. WELDING SHOP

Introduction , Classification of welding processes, safety precautions in welding, welding positions, welding joints, welding defects, practical exercises on arc welding only, soldering and brazing, practical exercises on soldering, Study of various machines used in welding shop.

4. SMITHY SHOP

Introduction, hand tools used in smithy shop, forgeable materials and temperature. Forging Operations, Safety Precautions, Practical Exercises covering utility jobs.

Dress code: Khaki uniform for Workshop-I.

ENGINEERING CHEMISTRY (BS-103)

L T P

3 1 0

1. LUBRICANTS

Introduction, Mechanisms of lubrication, Types and selection of lubricants, properties and different methods for testing of lubricating oils and greases.

2. CORROSION AND ITS CONTROL

Introduction, Types of corrosion, Mechanisms of corrosion, factors affecting corrosion & different techniques for corrosion control.

3. POLYMERS

Introduction, Effect of polymer structure on properties, Moulding of plastics into articles, Conducting polymers: preparation, types, properties and applications.

4. COMPOSITE MATERIALS

Introduction, Classification, constituents of composites, preparation of phenolic composites and their characterization, Fiber reinforced composites, Important types and failures of fiber reinforced composites, Advantages and applications of composites.

5. FUELS AND COMBUSTION

Introduction, classification, Coal: classification and analysis, NUCLEAR FUELS: sources, mass-defect, Breeder reactor, Fuel Cells.

6. WATER AND ITS TREATMENT

Introduction, water softening, domestic / industrial water treatment, Purification of water through Ion-exchange method, BOD, COD and treatment of Sewage.

7. INSTRUMENTATION TECHNIQUES

Introduction to UV-VIS & IR spectrophotometry, NMR & MS spectroscopy, SEM, X-RD, TGA/DTA and GC

TEXT BOOKS

1. Engineering Chemistry: by P C Jain & Monika Jain.
2. A Text Book of Engineering Chemistry: by Shashi Chawla.

REFERENCE BOOKS

1. Organic Chemistry: by Morrison R T and Boyd, Prentice Hall of India.
2. Advanced Organic Chemistry: by Jerry March, Wiley Interscience.
3. Applications of Absorption Spectroscopy of Organic Compounds: by John R. Dyer, Prentice Hall of India.
4. Spectroscopic Methods: by Williams & Fleming, Tata Mc Graw Hill.

MATERIALS SCIENCE (BS-105)

L T P

3 1 0

1. STRUCTURE OF MATERIALS

Space lattices and unit cells, crystal systems, structures of common metals, semiconductor, ceramic and superconductor materials, Miller indices, Representation of Directions and Planes, Packing Fractions, Structure Determination using X-ray diffraction, Bragg's law, and lattice parameter determination. Bonding in solids, coordination number, ceramics, silicates and clay structures, glass transition temperature, non-crystalline materials.

2. IMPERFECTION IN SOLIDS

Point defects: impurities, dislocations: edge and screw dislocation, stacking faults, grain boundaries, twins/twist boundaries, volume defects, concentrations of point defects, effect of defects on material properties.

3. PHASES DIAGRAMS AND PHASE TRANSFORMATION

Definition of diffusivity, concept of activation energy, Fick's laws of diffusion, diffusion mechanism and their applications, diffusion process Solid solutions, intermediate phases and inter-metallic compounds, phase, phase rule, unary, binary phase diagrams, phase diagrams of some important metals and ceramics, microstructure changes during cooling, lever rule, invariant reactions, iron-iron carbide phase diagram. Nucleation and growth of phases, Introduction to TTT curves, heat treatment processes, annealing, hardening, tempering, normalization, embrittlement, characterization of materials.

4. MECHANICAL BEHAVIOR

Elastic behavior of materials, Concept of engineering and true stress and true strain, Tensile property, Yield Point phenomenon, Elastic Modulus, work hardening, strengthening mechanism, fracture, creep and fatigue, hardness. Atomic model of elastic behavior, plastic deformation in single and polycrystalline crystal, mechanism of slip, critical resolved shear stress, ductile and brittle failure, Griffith's theory of brittle fracture.

5. MAGNETIC AND DIELECTRIC PROPERTIES OF MATERIALS

Origin of magnetism, dia, para, ferro, antiferro and ferrimagnetism, soft and hard magnetic materials, dielectric properties, piezo, pyro and ferroelectricity.

6. ELECTRICAL AND ELECTRONICS PROPERTIES

Electrical conductivity, Free electron theory, density of states, Fermi energy, Fermi-Dirac Statistics, Band theory of solids, metals, semiconductors, insulators, Semiconductors: intrinsic and extrinsic semiconductors, conductivity as a function of temperature, doping, Hall effect, carrier concentration of semiconductors.

TEXT BOOKS

1 Materials Science and Engineering: by William D Callister Jr

2 Elements of Materials Science & Engineering: by L. H. Van Vlack.

REFERENCE BOOKS

1 The Science & Engineering of Materials (5e): by Askeland, Donald R.; Pradeep P. Phulé (2005). Thomson-Engineering.

2 Solid State Physics: Properties of Materials: by M.A. Wahab, Narosa Publishing

3 Fundamentals of Materials Science & Engineering: by William F Smith.

BASIC ELECTRONICS ENGINEERING (ES-103)

L T P

3 1 0

1. SEMICONDUCTORS, DIODES AND DIODE CIRCUITS

Insulators, semiconductors and metals, Mobility and conductivity, Intrinsic and extrinsic semiconductors and charge densities in semiconductors, current components in semiconductors, continuity equation. PN Junction diode – characteristic and analysis, Types of diodes – Zener diodes, Photodiodes, Light emitting diodes (LED's), Varactor diodes and tunnel diodes. Rectifiers and filter circuits: Half wave, full wave and Bridge rectifier circuits and their analysis, L, C and Pi filters, Basic regulator supply using zener diode. Working of Switched Mode Power Supply.

2. TRANSISTORS

Construction and characteristics of bipolar junction transistors (BJT's)-Comm. Base, Comm. emitter, Comm. Collector configuration. Transistor at low frequencies – small signal low frequency transistor model (h-parameters). Analysis of transistor amplifier circuit using h-parameters. transistor biasing and bias stabilization: - the operating point, stability factor, analysis of fixed base bias, collector to base bias, Emitter resistance bias circuit and self bias circuit. Bias compensation techniques.

3. FIELD EFFECT TRANSISTOR

construction and characteristics of JFET. JFET biasing circuit, JFET amplifier, MOSFET construction and characteristics.

4. AMPLIFIERS AND OSCILLATORS

Classification of amplifiers, concept of feed back, general characteristics of feed back amplifiers, Single stage RC coupled amplifier. Oscillators – Criterion for Oscillation, type of oscillators: Hartley oscillator, Colpitt Oscillator & RC Phase shift oscillator.

5. OPERATIONAL AMPLIFIERS

Introduction to Op-amp, Inverting and non-inverting configuration, Applications – adder, subtractor, integrator, differentiator and comparator, practical op -amps.

6. ELECTRONIC INSTRUMENTS

Role and importance of general purpose test instruments, Electronic Miltimeter, Cathode Ray Oscilloscope, Measurement of amplitude, frequency and phase using CRO.

TEXT BOOKS

1. Electronics Devices and Circuits: by Millman & Halkias, Tata McGraw Hill, New Delhi.
2. Electronics Devices and Circuit theory: by Robert Boylestad.

REFERENCE BOOKS

1. Electronics Devices and Circuits: by P. John Paul.
2. Electronics Devices and Circuits: by Y.N. Bapat.
3. Electronics Devices and Circuit: by G.K. Mittal.

BASIC THERMODYNAMICS (ES-104)

L	T	P
3	1	0

1. BASIC CONCEPT

Dimensions and units, thermodynamic systems, thermodynamic properties and process, thermodynamic equilibrium, energy-kinetic, potential and internal, heat and work, zeroth law, concept of temperature, temperature scale, definition of ideal gas, laws and properties of ideal gas.

2. FIRST LAW OF THERMODYNAMICS

First law for control mass (closed system), internal energy as a property, enthalpy, specific heats, non-flow processes of ideal gases, cyclic processes, first law for control volume (open system), general energy equations, one dimensional steady flow, examples of control mass and control volume energy analysis, simple problems.

3. SECOND LAW OF THERMODYNAMICS

Limitations of first law of thermodynamics, Kelvin- Planck and Clausius statements and their equivalence, reversible processes, reversible cycles, and carnot cycle, corollaries of the second law, thermodynamics temperature scale, Clausius inequality, entropy, principle of increase of entropy, availability and irreversibility.

4. PROPERTIES OF STEAM

Phase transformation, phase diagram, generation of steam, condition of steam- saturated steam, dry-saturated steam, wet steam, superheated steam, dryness fraction, property of steam, steam tables, methods of determination of dryness fraction of steam, use of Mollier charts , process of vapours and various process.

5. GAS AND VAPOUR POWER CYCLE

General terms, Otto cycle, Diesel cycle, Dual cycle, working of 4 stroke petrol engines & diesel engines, working of 2 stroke petrol engine. Brayton cycle, Rankine cycle.

6. MIXTURES OF GASES AND VAPOUR

Introduction, Ideal gas mixtures, The Gibbs Dalton's law, General relationships, illustrative examples, volumetric and Gravimetric analysis, Mixture of gas and vapour, Psychrometric terms, Thermodynamic Wet Bulb temperature, Temperature of Adiabatic Saturation Enthalpy of moist air.

BOOKS RECOMMENDED

1. Engineering Thermodynamics: by P.K. Nag, Tata McGraw Hill, New Delhi.
2. Engineering Thermodynamics: by Gupta .& Prakash.
3. Heat Engineering: by Vasandani and D.S. Kumar.

ENGINEERING GRAPHICS (TA-101)

L	T	P
1	0	4

1. INTRODUCTION

Importance, Significance and Scope of Engineering Graphics. General Introduction to Drawing Instruments and their Use. Principle of Dimensioning and Scaling, Lettering: Single Stroke Vertical and inclined Letter. Orthographic Projections.

2. PROJECTION OF POINTS AND LINES

Projection of Points and Lines in Different Quadrants. Traces. Inclinations. True Lengths of Lines. Projections on Auxiliary Planes, Shortest Distance. Intersecting and Non-Intersecting Lines. Planes other than Reference Planes: Perpendicular and Oblique Planes, Their Traces, Inclinations etc. Projections of Points and Lines lying in the planes. Conversion of Oblique Plane into Auxiliary Plane and Solution of Related Problems.

3. PROJECTION OF PLANES

Traces of Planes, Types of Planes, Different cases of plane Figures making different angles with one or both Reference Planes and Lines Lying in the Plane Figures making different given angles with one or both Reference Planes, Obtaining True Shape of the Plane Figure by Projection.

4. PROJECTION OF SOLIDS

Simple cases when Solid is placed in different positions, Solids of Revolution, Axis perpendicular to a plane, Axis Parallel to one Plane and Inclined to the other, Axis Inclined to Both the Planes.

5. DEVELOPMENT OF SURFACES

Development of Prism, Pyramid, Cylinder, Cones only.

6. PROJECTIONS

Perspective, Orthographic, Isometric and Oblique Projections, Sketching of Orthographic views from Pictorial views, Isometric Projections of Planes, Prisms, Pyramids, Cylinders and Cones, Orthographic views of simple machine parts with and without sectioning.

7. GRAPHICS

Determination of various Reactions in Beams and Trusses by Graphical Methods (Funicular and Maxwell diagrams).

8. MACHINE DRAWING

Basic Concepts; IS Drawing Conventions, Line Symbols, Kinds of Lines, Bolted Joints. Locking arrangement for Nuts, Foundation Bolts.

9. COMPUTER GRAPHICS

Basic Concepts and Use, Drawings of Objects in computer Aided Drafting Software's like AUTO-CAD. Data plotting.

BOOKS SUGGESTED

1. Engineering Drawing: by N.D. Bhatt.
2. Engineering Drawing: by P. Bali.
3. Machine Drawing : by N.D. Bhatta & Panchali.

ENGINEERING CHEMISTRY LAB [BS-103(P)]

L	T	P
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Experiment No.	Description of Experiment
1	To determine the percentage of free chlorine in a given sample of Bleaching Powder, 10 gms of which have been dissolved per litre of the given solution.
2	To determine the amount of free chlorine in a given sample of tap water, provided approx. N/20 Hypo solution.
3	To determine the Moisture, Volatile matter, Ash and Carbon content in a given sample of coal by heating method. Identify the given coal.
4	To determine the total alkinity in a sample of tap water by using a standard acid.
5	To determine the temporary, permanent and total hardness in a given sample of tap water b soap titration method.
6	To determine the soluble, insoluble and total solids in given sample of sewage.
7	To determine the surface tension of a given liquid by drop number method. Identify the given liquid.
8	To determine the viscosity of a given liquid using Ostwald viscometer. Identify the given liquid.
9	To determine the saponification value of an oil sample.
10	To determine iodine- value of an oil.
11.	To determine the Biological Oxygen Demand (BOD) of a sewage sample.
12.	To determine the Chemical Oxygen demand (COD) of a sewage sample.

Dress code: White apron for Engineering Chemistry lab.

MATERIAL SCIENCE LAB [BS-105(P)]

L T P

0 0 2

Experiment No.	Description of Experiment
1	To measure the resistivity of the semiconductor (Germanium) crystal by four-probe method at different temperatures and determine its energy band-gap
2	Realization of hysterisis curve of a magnetic material using an oscilloscope
3	To determine energy band gap of semiconductor using the p-n junction diode
4	To identify crystal structure and determine the lattice parameter from the X-ray diffractometer plot of an unknown material
5	To determine the modulus of elasticity of metal/alloy by bending of beam method
6	To study the Hall effect In semiconductor and measure semiconductor parameter
7	To determine the Flash point and Fire point of a given lubricating oil using Pensky Martin's Apparatus.
8	To determine the viscosity of a given lubricating oil using Red Wood Viscometer (No. 1 & 2)
9	To determine the fineness of a given sample of cement using IS : 90 micron sieve
10	To determine the initial setting time of a given sample of cement, using Vicat's apparatus
11.	To determine the percentage of 45-46moisture in a given sample of Rock/Charcoal/Soil/Seeds, using Infra-Red Moisture balance method as well as crucible method
12.	To determine the percentage 47-48Graft Co-polymerisation of Vinyl monomer onto given polymeric back-bone using ceric ammonium nitrate as initiator

BASIC ELECTRONICS LAB [BS-103(P)]

L T P

0 0 2

Experiment No.	Description of Experiment
1	Familiarization of electronic components and equipments like CRO, function generator and power supplies etc.
2	To study the I-V characteristics of PN-Junction diode and determine static resistance and dynamic resistance.
3	To study the characteristics of Zener diode and hence determine the dynamic resistance from the I-V characteristics.
4	Determine the voltage regulation of Zener diode stabilizer.
5	To study and plot the wave form of half wave and full wave rectifier with and without capacitor filter.
6	To study and plot the input and output characteristics of common emitter transistor and calculate its input and output resistances.
7	To study and plot the input and output characteristics of common base transistor and calculate its input and output resistances.
8	To study the characteristics of FET (field effect transistor) and hence calculate dynamic (r_d),

mutual conductance (g_m) and amplification factor (μ).

9 To study the frequency response of single stage CE amplifier and hence calculate the band width.

10 To study the clipping circuit with p-n junction diode and Zener diode

WORKSHOP-II (WP-122)

L T P

1 0 3

1. PATTERN MAKING SHOP

Introduction, Common Safety Precautions in Pattern shop, Pattern materials, Pattern types and pattern allowances. Various Types of joints used in joinery work. Seasoning, Common hand tools, Various types of machines such as Wood working lathe, Spindle moulding machines, Over head router, Thickness planner etc. Practice jobs for various operations and joints (Butt joint, Lap joint, Circular joint), group demonstration on above machine and various power operated tools.

2. SHEET METAL SHOP

Introduction, Sheet metal tools, Sheet metal Operations, Sheet metal Machines, Sheet metal Joints, Fastening of sheet metal joints Practice. Job for various sheet metal Joints.

3. FOUNDRY SHOP

Introduction, Various hand moulding tools / equipments, moulding sand, preparation of moulds. Types of furnaces, moulding practice with different methods. Study of sand testing equipments.

4. TURNING SHOP

Introduction, lathe and its principal of working, Lathe Specifications, Parts of lathe . Lathe accessories and attachments. Various taper turning methods. Various lathe Operations. Practice jobs covering all basic operations on lathe machine.

Dress code: Khaki uniform for Workshop-II.

ENGINEERING MATHEMATICS-II [BS-122]

L T P

3 1 0

1. FOURIES 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, Typical wave-forms, Parseval's formula, Practical harmonic analysis.

2. MATRICES

Matrices, Related matrices, Complex matrices (Hermitian and skew-Hermitian matrices, Unitary matrix), Solution of linear system of equations, Rank of a matrix, Gauss-Jordan method, Normal form of a matrix, Vectors, Linear dependence, Consistency of a linear system of equations, Rouche's theorem, System of linear homogeneous equations, Linear and orthogonal transformations, Characteristic equation, Eigen values, Eigen vectors, Properties of eigen values, Cayley-Hamilton theorem, Reduction to diagonal form, Quadratic form and their reduction to canonical form.

3. ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER AND THEIR APPLICATIONS

Brief review of ordinary differential equations, Exact equations, Equations reducible to exact equations, Equations of the first order and higher degree, Clairut's equation, Applications of differential equations of first order (Orthogonal trajectories, Physical applications, Simple electric circuits).

4. COMPLEX NUMBERS

Applications of De Moivre's theorem, Exponential, Circular, Hyperbolic and Logarithmic functions of a complex variable, Inverse Hyperbolic functions, Real and imaginary parts of Circular and Hyperbolic functions, Summation of the series-'C+iS' method.

5. FUNCTIONS OF COMPLEX VARIABLE

Limit and derivative of complex functions, Cauchy-Riemann equations, Analytic functions and its applications, Geometrical representation of complex function, Conformal mapping and standard transformations, Complex integration, Cauchy's theorem, Cauchy's integral formula, Series of complex terms, Taylor's and Laurent's series, Cauchy's residue theorem and its application for the evaluation of real definite integrals.

TEXT BOOKS

1. Advanced Engineering Mathematics: by Erwin Kreyszig, John Wiley and Sons, NC, New York.
2. Advanced Engineering Mathematics: by R. K. Jain & S. R. K Iyengar, Narosa Pub. House.

REFERENCE BOOKS

1. Advanced Engineering Mathematics: by C. R. Wylie & L. C. Barrett, McGraw Hill.
2. Vector Calculus: by C. E. Weatherburn. John Wiley and Sons, NC, New York.
3. Complex variables and Applications: by R. V. Churchill, T. J. Brown & R. F. Verhey, McGraw Hill.
4. Differential Equations: by Shepley L. Ross, John Wiley & Sons, New York.

ARCHITECTURAL DESIGN–I (AR-111)

Contact Hours per Week			Final Exam.	Sessional			Total	Exam Duration	Credit
L T P D	Total			Mid-term	External	Internal			
2 - - 6	8	45		-	30	60+15#	150	6 hours	05

OBJECTIVE

To train students in visual compositions using various elements of design as also to make them familiar with the meaning and purpose of Architectural design.

# Indicates marks to be awarded for the time problem.

CONTENTS

UNIT I (Time: 05 weeks)

Introduction to the Concept of design in everyday life, Objectives of design, Elements of design such as Line- Form- Space- Texture- Colour- etc. and Principles of design such as Scale- Balance- Proportion- Rhythm- Harmony- Contrast- etc. Application of the same through exercises in two dimensional and three dimensional compositions using single and multiple types of elements.

UNIT II (Time: 04 weeks)

- Introduction to outdoor sketching through basic exercises like sketching of trees and shrubs, sketching of simple buildings with special emphasis on background and foreground and sketching of human figures using pencil of different grades. Illustrative examples to be followed explaining the various techniques.

- Introduction to transparent water colours, poster colours, pastel colours and their tonal values.
- Introduction to colour theory and detailed studies of primary, Secondary and Intermediate colours in the form of drawing geometric compositions

UNIT III (Time: 02 weeks)

- Introduction to pencils with different grades such as F, H, HB, 2B, 4B and 6B. Representation of the different lines created by the different pencils by varying thick-Ness and pressure. Representation of various textures with thick, thin and flat pencil Strokes. Illustrative examples to be followed explaining the various techniques.
- Introduction to indoor sketching through basic exercises like sketching of simple solids, using pencils of different grades showing shades and shadows. Rendering of stone and brick walls in pencil. Illustrative examples to be followed explaining the various techniques.

UNIT IV (Time: 03 weeks)

Study of human dimensions and proportions followed by designing of spaces such as living, dining, sleeping, kitchen, toilets etc, with furniture layout.

NOTE:

- The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.
- One time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed programme for time problem with reference to the above contents.

REFERENCE BOOKS

1. Design through Discovery: by M.E. Bevlin.
2. Drawing and Perceiving: by Douglas Cooper.
3. Principles of Design in Architecture: by K.W. Smithies.
4. Architectural Drawing: by Tom Porter.
5. Architectural Graphics: by A Ching Frank.
6. Time Saver Standards for Architectural Design Data: by John Hancock Callender.
7. Time Saver Standards for Building Design Data: by John Hancock Callender.
8. Architectural Graphic Standard: by Ramsey/Sleeper.
9. Envisioning Architecture: by Iain Fraser & Rod Henmi.

BUILDING CONSTRUCTION & MATERIALS–I (AR-112)

Contact Hours per Week					Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total		Mid-term	External	Internal			
2	-	1	3	6	35	25	-	60	120	4 hours	04

OBJECTIVE

To familiarize the students with construction details of various components of a small single storied building.

CONTENTS

UNIT I (Time: 08 weeks)

- Brick Masonry, Various types of bonding in walls such as Stretcher bond-English bond-Single & Double Flemish bond etc. These bonds are to be explained with respect to varying wall thickness such as ½ brick-1 brick- 1½ brick etc. and various types of junctions such as L junction- T junction- Cross junction etc.

- Stone masonry of various types such as Rubble walling, Polygonal walling, Flint walling, Ashlars walling, Masonry joints, Maintenance etc.

UNIT II (Time: 03 weeks)

- Introduction to Lintels- Arches- Window sills and their methods of construction.
- Introduction to various components of building such as foundations, wall, roofs etc.

UNIT III (Time: 03 weeks)

- Process of rock formation. Various kinds of stones used for Building Construction, their properties, applications etc.
- Bricks – Manufacturing, Types, Sizes, Properties and Uses.

Note: The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

1. Building Construction: by Sushil Kumar.
2. Building Construction Metric Vol. 1-2: by W.B.Mckay.
3. Building Construction Illustrated: by Francis D.K. Ching.
4. Construction Technology Vol. 1: by R. Chudley.
5. Appropriate Building Materials: by Roland Stulz & Kiran Mukerji.
6. A Textbook of Building Construction: by S.P.Arora & S.P.Bindra.

HISTORY OF ARCHITECTURE–I (AR-113)

Contact Hours per Week					Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total		Mid- term	External	Internal	120	3 hours	04
3	1	-	-	4	60	30	-	30			

OBJECTIVES

- To understand the role of geo-physical, societal, political and technological factors in the evolution of Architectural and Urban form.
- To develop a holistic approach to Architecture as an integral component of the built environment.

CONTENTS

UNIT I (Time: 02 weeks)

- Introduction to Indus Valley civilization. Study of architectural characteristics.
- Introduction to the Vedic village. Study of its building typology and construction.

UNIT II (Time: 02 weeks)

- Introduction to Buddhist settlement in India.
- Detailed studies of Architectural characteristics of various building types such as Stupas, Chaityas and Viharas through suitable examples from each geographical context to Illustrate differences in Form, Construction methods and Ornamentation.

UNIT III (Time: 04 weeks)

- Study of evolution of Hindu architecture, Rock-cut and structural forms and comparison of Temple forms in various regions of India.

- Study of various styles of temples such as Dravidian, Indo-Aryan Orissan, Jain with respect to functional components, architectural Form, construction and ornamentation.

ISLAMIC PERIOD

UNIT IV (Time: 04 weeks)

- **Delhi or Imperial Style** :Slave, Khilji, Tughlaq, Sayyed, Lodhi
- **Provincial Style** Bengal , Jaunpur, Deccan, Malwa, Bijapur
- **Moghul Architecture in North India under** : Humayun, Jehangir, Akbar, Shahjehan

NOTE:

- The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.
- Analysis of architectural style/building typology must include functional, constructional and Architectural, ornamental aspects.

REFERENCE BOOKS

1. Architecture in India: by Marilia Albanesa.
2. Hindu Architecture: by Henri Stierlin.
3. Ancient Indian Architecture: by Maheshwari and Garg.
4. The Hindu Temple: by R. Champakalakshmi Usha Kris.
5. Indian Architecture: by Satish Grover.
6. Excavation in Fatehpur Sikri.

STRUCTURE–I (AR-114)

Contact Hours per Week					Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total		Mid-term	External	Internal	90	3 hours	03
2	1	-	-	3	45	25	-	20			

OBJECTIVE

To understand the basic principles of Structural Mechanics, so that it forms the basis for study of Structural Design

CONTENTS

UNIT I (Time: 04 weeks)

- Study of Force-definition, cause, effect and units. Understanding Force through vector and graphical representation.
- Study of Coplanar, Concurrent, Nonconcurrant forces, Triangle of forces, Parallelogram of forces and Conditions of Equilibrium – analytical and graphical methods.
- Study of Moments, Moment of forces, Moment of couples and Static equilibrium of rigid bodies.

UNIT II (Time: 06 weeks)

- Study of various types of loads such as Dead , Live , Wind , Impact , snow and Earthquake .
- Study of various types of Supports such as Roller, Hinged and Fixed.
- Study of Structural system design such as Fundamental characteristics, Strength, Stability, Ability, Rigidity, Economy and Aesthetics.

UNIT III (Time: 04 weeks)

- Determination of Center of gravity, Moment of Inertia of square, rectangle, L shaped, T shaped and I shaped cross-sections.
- Study of Forces in simple Pin jointed frames under the action of dead and wind loads by graphical methods, methods of sections and methods of joints.

NOTE: The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

1. Basic Structural Analysis S.I. Units: by C.S. Reddy.
2. Analysis of Structures: by Vazarani V.N. & Ratwani M.M.
3. A Textbook of Structural Mechanics in S.I. Units: by R.S.Khurmi.
4. Key to Mechanics of Structure: by S.B. Junarkar .

ARCHITECTURAL DESIGN–II (AR-121)

Contact Hours per Week					Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total		Mid-term	External	Internal			
2	-	-	8	10	55	-	25+15*	70+15#	180	6 hours	06

* Indicates marks to be awarded on the basis of educational tour conducted during the winter break after the previous semester.

# Indicates marks to be awarded for the time problem.

OBJECTIVE

To train students in understanding the Interdependence of Form, Function, Structure and Services in the process of Architectural design.

CONTENTS (14-weeks)

Design of a single storied load bearing structure such as a Check post, Post Office, Crèche, Dispensary etc. The student should be guided to achieve necessary relationship between indoor and outdoor spaces and to understand the role of elements of structures in a built form.

NOTE: Two design problems each of 05 to 06 weeks and one time problem of 01 week is to be completed in this semester. The concerned faculty is required to frame a detailed programme for each of the above design problems and time problem with reference to the above contents.

REFERENCE BOOKS

1. Elements of Architecture: by Rob Krier.
2. Building drawing with an integrated approach to Built Environment: by Shah, Kale & Patki.
3. Time Saver Standards for Architectural Design Data: by John Hancock Callender.
4. Time Saver Standards for Building Design Data: by John Hancock Callender.
5. Building Construction Illustrated: by Francis D.K. Ching.

BUILDING CONSTRUCTION & MATERIALS–II (AR-122)

Contact Hours per Week					Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total		Mid-term	External	Internal	120	4 hours	04
2	-	-	4	6	35	25	-	60			

OBJECTIVE

To familiarize the student with use of timber in building construction.

CONTENTS

UNIT I (Time: 05 weeks)

- Introduction to joinery in timber.
- Detailed drawings and construction details of Battened-Ledged-Braced doors, Battened-Braced-Framed doors, Flush doors etc.
- Introduction to various types of windows in Timber. Detailed drawings and construction details of Casement windows and Bay windows in Timber.
- Workshop practice for carpentry joints used in "2" and "3".

UNIT II (Time: 02 weeks)

- Introduction to the nature and characteristics of wood floors at ground and first floor level, its advantages & Limitations..

UNIT III (Time: 05 weeks)

- Introduction to the nature and characteristics of wood construction-roofs, its advantages and Limitations. Detailed drawings and construction details of flat roof batten & tile and various types of sloping roofs in timber such as Lean to roofs, King Post truss and Queen Post truss using AC/CGI, Mangalore tiles & slates roof coverings.

UNIT IV (Time: 02 weeks)

- Introduction to paints and varnishes. Detailed studies such as manufacturing, types and application of the same. Introduction to popular brand names.

Note: The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.

REFERENCE BOOKS

1. Construction of Buildings Vol.1- 2: by R Barry.
2. Building Construction Metric Vol. 3: by W.B.Mckay.
3. Building Construction Illustrated: by Francis D.K. Ching.
4. Construction Technology Vol. 1-4: by R. Chudley.
5. Carpentry A Complete guide: by H.S.Bawa.
6. Carpentry and Joinery: by George Mitchell.
7. Wood Working Handbook: by J. T.Adams.

HISTORY OF ARCHITECTURE-II (AR-123)

Contact Hours per Week					Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total		Mid- term	External	Internal	120	3 hours	04
3	1	-	-	4	60	30	-	30			

OBJECTIVE

History of Architecture is to be taught with a view towards understanding how different architectural solutions were evolved in successive historical periods within the restraint imposed by prevalent social and religious customs, available building materials, complex structural problems and the limited technology available at that time.

CONTENTS

UNIT-I (Time: 04 weeks)

- Introduction to examples of early shelter, Stone Age as an expression of man's physical and spiritual needs.
- Introduction to determinants of built form.
- Introduction to Egyptian civilization. Study of local context and architectural characteristics of public buildings such as mastabas, pyramids and temples to be explained with examples.

UNIT-II (Time: 04 weeks)

- Introduction to Mesopotamian civilization. Study of urban context and architecture of Public buildings such as Ziggurat of Ur city and Palace of Khorsabad.
- Introduction to Greek civilization. Architectural characteristics of typical civic spaces such as Agora, Acropolis, theatres.
- Systems of proportioning, Greek orders, optical corrections etc. through illustrative examples such as Parthenon etc.

UNIT-III (Time: 06 weeks)

- Study of Roman town with respect to location, Architectural characteristics of typical civic spaces such as Forum, theatres etc.
- Detailed studies of monuments/temples of Roman period with reference to materials, construction systems, Roman orders through illustrative examples.
- Study of development of Church plans during the early Christian period with respect to architectural character.

NOTE

- In each period given below, the architectural characteristics and minimum one example may be highlighted.
- The time mentioned at the end of each of the above units indicates the tentative time taken to complete each. The marks for sessional work may be divided accordingly.
- Analysis of architectural style/building typology must include functional, constructional/structural and ornamental aspects.

REFERENCE BOOKS

1. The World of Architecture: by Paul Holbertson.
2. Greece: by Henry Sterlin.
3. A History of Architecture: by Sir Banister Fletcher.
4. A History of Architecture: by Spiro Kostof.
5. Encyclopedia of World Architecture: by James Ferguson.
6. The Roman Empire: by Henry Sterlin.

STRUCTURE II (AR-124)

Contact Hours per Week				Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total	Mid-term	External	Internal	90	3 hours	03
2	1	-	-	3	45	25	-	20		

OBJECTIVES

To understand the principles of Structural Analysis, so that it forms the basis for Structural design.

CONTENTS

UNIT I (Time: 04 weeks) STRESSES AND STRAINS

Stress, strain, Hooke's Law, stress-strain curve, stressed streams in simple and composite sections, temperature stresses, Poisson's ratio, state of simple shear, shear strain, Bulk modulus, Principal stresses and strains, Mohr circle.

UNIT II (Time: 02 weeks) BENDING MOMENT AND SHEAR FORCE:

Basic concepts, bending moment and shear force diagram for simple beams and frames for various types of loadings and support conditions.

UNIT III (Time: 02 weeks) BENDING STRESS IN BEAMS

Theory of simple bending, section modulus, design criterion, bending stresses in symmetrical and unsymmetrical sections, strength of sections.

UNIT IV (Time: 02 weeks) SHEAR STRESSES IN BEAMS:

General, shear stress distribution for rectangular, circular and I-section. Shear stress distribution for unsymmetrical sections.

UNIT V (Time: 02 weeks) TORSION OF SHAFTS

Introduction, Relation between twisting moment-twist and shear stress, design of shafts.

UNIT VI (Time: 02 weeks) THIN CYLIDRICAL AND SPECIAL SHELLS:

Introduction, Stresses in thin cylindrical and spherical shells, internal pressure, change in volume.

NOTE: The time mentioned at the end of each of the above unit indicates the tentative time taken to complete each. The marks for sessional works may be divided accordingly.

REFERENCE OF BOOKS

1. Strength of Materials: by S.Ramamurthan.
2. Strength of Materials and theory of Structure: by B.C.Punmia.
3. Strength of Materials: by Timoshenko & Young.
4. Experimental Stress Analysis: by Sadhu Singh.
5. Strength of Material: by Sadhu Singh.

ARCHITECTURAL DRAWING & GRAPHICS–I (AR-125)

Contact Hours per Week				Final Exam.	Sessional			Total	Exam Duration	Credit
L	T	P	D	Total	Mid-term	External	Internal	120	4 hours	04
2	-	-	4	6	35	25	-	60		

OBJECTIVE

To train students in understanding the representation of graphical/ orthographical drawing and develop a logistic approach to represent the overall concepts/ idea of any project.

CONTENTS

UNIT I (Time: 03 weeks)

- Introduction to Sections of Solids such as True sections and Virtual sections followed by illustrative examples.
- Introduction to Intersection of Solids explaining Lines of Intersection and Curves of Intersection followed by Illustrative examples.
- Development of Surfaces of Solids followed by Illustrative examples in Model making.

UNIT II (Time: 01 week)

- Representation of a single room through Roof plan, Sectional Plan, Elevation and Sectional Elevation showing the various Building elements and furniture layout.

UNIT III (Time: 02 weeks)

- Detailed studies teaching methods of drawing Axonometric/Isometric views of compositions/complex forms.
- Detailed studies teaching method of drawing One Point Perspective and Two Point Perspective using conventional plan method of simple and complex objects.

UNIT IV (Time: 03 weeks)

- Introduction to indoor sketching through basic exercises like sketching of simple solids, using pencils of different grades showing shades and shadows. Rendering of stone and brick walls in pencil. Illustrative examples to be followed explaining the various techniques.

Note: Unit I, II & III will be taught by faculty from Architecture while Unit IV will be taught by faculty from Applied arts / Fine arts

REFERENCE BOOKS

1. Sketching the Concept: by Harold Linton and Scott Sutton.
2. DRAW How To Master The Art: by Jeffery Camp.
3. Drawing Masterclass: by Ron Bowen.
4. Drawing the Landscape: by Chip Sullivan.
5. Creative perspective: by Robert Gill.
6. Rendering with Pen and Ink: by Robert Gill.
7. Architectural Rendering: by Philip Crowe.
8. Drawing and Perceiving: by Douglas Cooper.
9. Architectural Drawing: by Tom Porter.
10. The Joy of Drawing: by Bill Martin.
11. EnvisioniJ;1g Architecture: by Iian Fraser and Rod Henmi.
12. Engineering Drawing: by N.D. Bhatt.

Important Dates

	Odd Semester	Even Semester
1st Mid Term Examination	14-09-2009 to 16-09-2009	15-02-2010 to 17-02-2010
2nd Mid Term Examination	04-11-2009 to 06-11-2009	31-03-2010 to 02-04-2010
End Semester Theory Examinations	02-12-2009 to 09-12-2009	05-05-2010 to 12- 05 -2010
Winter break for students	10-12-2009 to 03-01-2010	
Summer vacation for students	13-05-2010 to 25-07-2010