DAVUNIVERSITY JALANDHAR

Course Scheme & Syllabus

For

B. Tech. in Civil Engineering

1st TO 8th SEMESTER
Examinations2015–2016 Session

Syllabi Applicable For Admissions in 2015

DAV UNIVERSITY, JALANDHAR

Scheme of Courses
B. Tech. in Civil Engineering
Semester-1

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	MTH151A	Engineering Mathematics-I	3	1	0	4	Core
2	CHE151A	Chemistry	4	0	0	4	Core
3	CSE101A	Computer Fundamentals and Programming	4	0	0	4	Core
4	EVS100	Environmental Studies	4	0	0	4	AECC
5	MEC101A	Engineering Drawing	2	0	4	4	Core
6	ENG151A	Basic Communication Skills	3	0	0	3	AECC
7	CHE152	Chemistry Lab	0	0	2	1	Core
8	CSE103	Computer Fundamentals and Programming Lab	0	0	2	1	Core
9	ENG152	Basic Communication Skills Lab	0	0	2	1	AECC

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Scheme of Courses
B. Tech. in Civil Engineering
Semester-2

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	MTH152A	Engineering Mathematics-II	3	1	0	4	Core
2	PHY151A	Engineering Physics	4	0	0	4	Core
3	MEC103	Mechanical Engineering Fundamentals	4	0	0	4	Core
4	ELE101	Electrical and Electronics Technology	4	0	0	4	Core
5	SGS107	Human Values and General Studies	4	0	0	4	AECC
6	MEC104	Manufacturing Practice	0	0	4	2	Core
7	PHY152	Engineering Physics Lab	0	0	2	1	Core
8	ELE102	Electrical and Electronics Technology Lab	0	0	2	1	Core

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

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Scheme of Courses
B. Tech. in Civil Engineering
Semester-3

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	MTH252	Engineering Mathematics-III	4	1	0	4	Core
2	CIV201	Principles of Surveying	3	0	0	3	Core
3	CIV203	Hydraulic Engineering-1	4	1	0	4	Core
4	CIV205	Environment Engineering-1	3	0	0	3	Core
5	CIV207	Building Material and Construction	3	0	0	3	Core
6	CIV209	Strength of Materials	4	1	0	4	Core
7	CIV211	Surveying Laboratory	0	0	3	2	Core
8	CIV213	Hydraulic Engineering Laboratory	0	0	2	1	Core
9	CIV215	Strength of Materials Laboratory	0	0	2	1	Core

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Scheme of Courses
B. Tech. in Civil Engineering
Semester-4

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV202	Geomatic Engineering.	3	0	0	3	Core
2	CIV204	Theory of Structure-1	4	1	0	4	Core
3	CIV206	Design of Concrete Structure-1	4	1	0	4	Core
4	CIV208	Hydraulic Engineering-2	4	1	0	4	Core
5	CIV210	Engineering Geology	3	0	0	3	Core
6	CIV212	Construction Machinery and Works Management	3	0	0	3	Core
7	CIV214	Design of Concrete Structure-1 Lab	0	0	2	1	Core
8	CIV216	Theory of Structure-1 Lab	0	0	2	1	Core

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Note: At the end of the examination of 4th Semester the students will undergo compulsory survey camp to be held in hilly area for a period of 2-4 weeks duration. Every student will submit the Camp/Training Report within two weeks from the start of teaching for 5th Semester. The marks for this will be included in the 5th Semester.

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Scheme of Courses
B. Tech. in Civil Engineering
Semester-5

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV301	Design of Steel Strcuture-1	4	1	0	4	Core
2	CIV303	Theory of Structure-2	4	1	0	4	Core
3	CIV305	Geo-technical Engineering	3	1	0	3	Core
4	CIV307	Transportation Engineering	3	1	0	3	Core
5	CIV309	Irrigation Engineering-1	4	0	0	4	Core
6	CIV311	Estimation and Costing	3	0	0	3	Core
7	CIV313	Geo-Technical Engineering Lab	0	0	2	1	Core
8	CIV315	Transportation Engineering Lab	0	0	2	1	Core
9	CIV317	Computer Aided Steel Drawing	0	0	2	1	Core
10	CIV319	Survey Camp	0	0	0	2	Training, D & P

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Scheme of Courses
B. Tech. in Civil Engineering
Semester-6

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV302	Design of Concrete Structure-2	4	1	0	4	Core
2	CIV304	Foundation Engineering	4	1	0	4	Core
3	CIV306	Environmental Engineering-2	4	0	0	4	Core
4	CIV3XX	DSE- I	4	0	0	4	DSE-I
5	CIV324	Fundamentals of Earthquake Engineering	3	0	0	3	Core
6	CIV326	Natural Hazards & Disaster Management	3	0	0	3	Core
7	CIV310	Environmental Engineering-2 Lab	0	0	2	1	Core
8	CIV312	Computer Aided Concrete Drawing	0	0	2	1	Core

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Note:
- *Department specific elective-I should be from the basket of "Department Specific Elective-I".*
- *At the end of the examination of 6th Semester the students will undergo compulsory industrial training for a period of 6 weeks duration in reputed industries. Every student will submit the training report within two weeks from the start of teaching of 7th Semester. The marks for this will be included in the 7th semester.*

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Scheme of Courses
B. Tech. in Civil Engineering
Semester-7

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV401	Composite Materials	3	0	0	3	Core
2	CIV403	Design of Steel Structure-2	4	1	0	4	Core
3	CIV405	Irrigation Engineering-2	3	1	0	3	Core
4	XXX	Generic Elective - I	4	0	0	4	GE-I
5	CIV4XX	DE-II	4	0	0	4	DSE-II
6	CIV417	Project	0	0	6	4	Training, D & P
7	CIV419	Industrial Practical Training**	-	-	-	2	Training, D & P

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Note:
- *Department specific elective-II should be from the basket of "Department Specific Elective-II".*
- *Generic elective-I should be from the "Generic Elective Basket"*

Scheme of Courses
B. Tech. in Civil Engineering
Semester-8

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	XXX	Generic Elective - II	4	0	0	4	GE-II
2	CIV404	Railways, Airports and Harbour Engineering	3	1	0	3	Core
3	CIV4xx	DSE-III	4	0	0	4	DSE-III
4	CIV4xx	DSE-IV	4	0	0	4	DSE-IV
5	CIV426	Building Maintenance and Repair	3	0	0	3	Core
6	CIV424	Seminar	0	0	3	2	Training, D & P
7	ENG351	Technical Communication	3	0	0	3	AECC

L: Lectures   T: Tutorial   P: Practical   Cr: Credits

Note:
- *Department specific elective-III & IV should be from the basket of "Department Specific Elective-III & IV" respectively.*
- *Generic elective-II should be from the "Generic Elective Basket"*

Department Specific Elective-I

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV316	Elements of remote sensing, GIS and GPS	4	0	0	4	Surveying
2	CIV318	Architecture and town Planning	4	0	0	4	Planning
3	CIV320	Theory of Structure-3	4	0	0	4	Structures
4	CIV322	Traffic Engineering	4	0	0	4	Transportation

Department Specific Elective-II

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV409	Dynamics of Structure	4	0	0	4	Structures
2	CIV411	Ground improvement techniques	4	0	0	4	Geotechnical
3	CIV413	Hydrology and Dams	4	0	0	4	Hydraulics
4	CIV415	Bridge Engineering	4	0	0	4	Transportation

Department Specific Elective-III

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV406	Plastic Analysis of Structure	4	0	0	4	Structures
2	CIV408	Pavement design	4	0	0	4	Transportation
3	CIV410	Earth and Earth retaining structures	4	0	0	4	Geotechnical
4	CIV412	Advanced Environmental Engineering	4	0	0	4	Environmental

Department Specific Elective-IV

S.NO.	Paper Code	Course Title	L	T	P	Cr	Nature of Course
1	CIV414	Pre-stressed concrete	4	0	0	4	Structures
2	CIV416	Advanced foundation Engineering	4	0	0	4	Geotechnical
3	CIV418	Soil dynamics	4	0	0	4	Transportation
4	CIV420	Flood control and River engineering	4	0	0	4	Hydraulics

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Generic Elective Basket

S.NO.	Paper Code	Course Title	L	T	P	Cr
1	ELE801	Electro-Mechanical Energy Conversion	4	0	0	4
2	ELE802	Transducers and Signal Conditioning	4	0	0	4
3	CHL801	Industrial Pollution Control	4	0	0	4
4	CHL802	Fuel Cell Technology	4	0	0	4
5	MEC801	Industrial Engineering Techniques	4	0	0	4
6	MEC802	Energy Resources	4	0	0	4
7	CSE801	Software Engineering & Project Management	4	0	0	4
8	CSE802	Computer Networks	4	0	0	4
9	ECE801	Communication and Media Foundations	4	0	0	4
10	ECE802	Electronic Displays	4	0	0	4
11	ECE803	Everyday Electronics	4	0	0	4
12	CIV801	Construction Materials and Techniques	4	0	0	4
13	CIV802	Railway and Tunnel Engineering	4	0	0	4
14	MGT001	Fundamentals of Management	4	0	0	4
15	MGT002	Fundamentals of Advertising	4	0	0	4
16	MGT003	Fundamentals of Stock Market	4	0	0	4
17	MGT004	Fundamentals of Research Methods	4	0	0	4

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B Tech Course Structure

CBCS	Nature of Courses	Core	Elective Courses			Ability Enhancement Courses		Total Credits
Year	Course Structure	Core	Dissertation/ Project	Generic Elective	Discipline Specific Elective	Ability Enhancement Compulsory Courses	Skill Enhancement Courses	
2015	Civil	146	6	8	16	15	4	195

Core	Basic Sciences (BS) including Mathematics, Physics, Chemistry, Biology	Engineering Sciences (ES) including Materials, WS, ED, Basics of EE/ME/CSE	Interdisciplinary Core	Discipline Core	Total Credits
146	18-26	20	04-20	80-104	146

Detailed Syllabus

DAV UNIVERSITY, JALANDHAR

FIRST SEMESTER

Course Title: Engineering Mathematics-I

Paper Code: MTH151A

L	T	P	Credits
3	1	0	4

Objective: The aim of this course is to familiarize the students with the theory of matrices which are used in solving equations in mechanics and the other streams. This course also provides a comprehensive understanding of the origin and development of ideas to exhibit the techniques origin and development of ideas to exhibit the techniques of solving ordinary differential equations.

Unit-A

Rank of matrices, Inverse of Matrices, Gauss Jordan Method, reduction to normal form, Consistency and solution of linear algebraic system of equations, Gauss Elimination Method, Eigen values and Eigen vectors, Diagonalisation of Matrix, Cayley Hamilton theorem. Orthogonal, Hermition and unitary matrices.

Unit-B

Concept of limit and continuity of a function of two variables, Partial derivatives, Homogenous Function , Euler's Theorem, Total Derivative, Differentiation of an implicit function, chain rule, Change of variables,Jacobian, Taylor's and McLaurin'sseries. Maxima and minima of a function of two and three variables: Lagrange's method of multipliers.

Unit-C

Formation of ordinary differential equations, solution of first order differential equations by separation of variables, Homogeneous equations, Reduce to Homogenous, exact differential equations, equations reducible to exact form by integrating factors, equations of the first order and higher degree, clairaut's equation.

Unit-D

Solution of differential equations with constant coefficients: method of differential operators. Non – homogeneous equations of second order with constant coefficients: Solution by method of variation of parameters, Simultaneously Linear differential equation.

References:

1. Grewal, B.S. *Higher Engineering Mathematics*. New Delhi: Khanna Publication, 2009.
2. Kreyszig, Erwin. *Advanced Engineering Mathematics*. New Delhi: Wiley Eastern Ltd., 2003.
3. Jain, R K, and K Iyengar S R. *Advanced Engineering Mathematics*, New Delhi: Narosa Publishing House, 2003.
4. Thomas, George B. and Finney Ross L. *Calculus and Analytic Geometry*. New Delhi Addison Wesley, 1995.

DAV UNIVERSITY, JALANDHAR

Course Title: Chemistry

Course Code: CHE151A

L	T	P	Credits
4	0	0	4

Course Objectives:

The objective of the Engineering Chemistry is to acquaint the student with the basic phenomenon/concepts of chemistry for the development of the right attitudes by the engineering students to cope up with the continuous flow of new technology. The student will able to understand the new developments and breakthroughs efficiently in engineering and technology.

Expected Prospective:

This course will equip students with the necessary chemical knowledge concerning the fundamentals as well as new technology in the field of chemistry.

Unit- A

Spectroscopy and its Applications

General Introduction: Introduction, electromagnetic spectrum, absorption and emission spectrum, atomic and molecular spectroscopy, types of molecular spectra, experimental techniques, selection rules, width and intensities of spectral lines.

UV/Visible Spectroscopy: types of electronic Transitions, Chromophores, Auxochromes, Effect of conjugation on Chromophores, Factors affecting λmax and intensity of spectral lines, effect of solvent on λmax, isobestic point, applications.

IR Spectroscopy: Infrared region, fundamental modes of vibrations and types, theory of infrared spectra, vibrational frequency and energy levels, anharmonic oscillator, modes of vibrations of polyatomic molecules, characteristic signals of IR spectrum, finger print region, factors affecting vibrational frequency; applications.

NMR Spectroscopy: Principle and instrumentation, relaxation processes, proton magnetic resonance spectroscopy, number of signals, Chemical shift, Spin-Spin Splitting, coupling constant, applications.

Unit- B

Water and its treatment

Introduction, hardness of water, degree of hardness, units of hardness, boiler feed water: specification, scales and sludge formation; priming& foaming, boiler corrosion, caustic

embrittlement, treatment of boiler feed water, internal treatment of water; softening of water by lime-soda, zeolite and ion exchange methods, desalination of water; Water for domestic use: purification of water for domestic use.

Corrosion and its Prevention

Introduction; different types of corrosion - wet and dry corrosion; mechanism of wet corrosion; comparison of dry and wet corrosion, Types of electrochemical corrosion: galvanic corrosion, concentration cell corrosion or differential aeration corrosion, waterline corrosion, pitting corrosion, crevice corrosion, stress corrosion, intergranular corrosion; other forms of corrosion: atmospheric corrosion, soil corrosion, microbiological corrosion, erosion corrosion, Filliform corrosion, stray current corrosion, passivity, galvanic series, factors influencing corrosion, various methods of corrosion control.

Unit-C

Chemistry in Nanoscience and Technology

Introduction,Materials self-assembly, molecular vs. material self-assembly, hierarchical assembly, self-assembling materials, two dimensional assemblies, mesoscale self-assembly, coercing colloids, nanocrystals, supramolecular structures, nanoscale materials, future perspectives applications,nanocomposites and its applications.

Unit-D

Polymers and polymerization

Introduction, monomer and repeating unit, degree of polymerization, functionality, classification of polymers: based on origin, monomers, structure, method of synthesis, tacticity or configuration, action of heat, chemical composition, ultimate form; types of polymerization, specific features of polymers, regularity and irregularity, tacticity of polymers, average molecular weights and size, determination of molecular weight by number average methods, effect of molecular weight on the properties of polymers, introduction to polymer reinforced composites.

References:

1. William Kemp, *Organic Spectroscopy*, Palgrave Foundations, 1991.

2. D. A. Skoog, F. J. Holler and A. N. Timothy, *Principle of Instrumental Analysis*, 5th Edition., Saunders College Publishing, Philadelphia, 1998.

3. C. P. Poole, Jr., F. J. Owens, *Introduction to Nanotechnology*, WileyInterscience, 2003.

4. L.E. Foster, Nanotechnology, *Science Innovation & Opportunity*, Pearson Education, 2007.

5. P. Ghosh, *Polymer Science and technology*(2nd Edition), Tata McGraw Hill, 2008.

6. Wiley *Engineering Chemistry*, Second Edition, 2013.

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Fundamentals and Programming

Course Code: CSE101A

L	T	P	Credits
4	0	0	4

Course Objective: To get basic knowledge of computers (hardware and software), its components and Operating systems. To acquire programming skills in C, basic knowledge of Internet

Unit-A

Introduction to Computers

Define a Computer System, Block diagram of a Computer System and its working, memories, Volatile and non-volatile memory, cache, virtual, secondary storage devices-Magnetic Tape, Hard Disk, CD-DVD, Magnetic Disk, Various input devices including keyboard, Mouse, Joystick, Scanners and Various output devices including Monitors, Printers, Plotters

Operating Systems

Computer Software and its types and Hardware, Operating Systems, their types and functions

Unit-B

Working Knowledge of Computer System

Introduction to word processors and its features, creating, editing, printing and saving documents, spell check, mail merge, creating power point presentations, creating spreadsheets and simple graphs.

Fundamentals of Internet Technology

Local area networks, MAN and wide area network, Internet, WWW, E-mail, Browsing and Search engines, Internet Connectivity, Network Topology, Hub, Switches, Router, Gateway.

Unit-C

Basic Constructs of C

Keywords, Identifiers, Variables, Data Types and their storage, Arithmetic Operators, Relational Operators, Logical Operators, Bitwise Operators, Increment & Decrement Operators, Expressions, Conditional Expressions, Assignment Operators and Expressions, External Variables and Scope of Variables, Structure of C Program.

Control Structures

Decision making statements: if, nested if, if – else ladder, switch, Loops and iteration: while loop, for loop, do – while loop, break statement, continue statement, goto statement.

Unit-D

Functions

Advantages of functions, function prototype, declaring and defining functions, return statement, call by value and call by reference, recursion, and storage classes.

Arrays and Strings

Declaration of arrays, initialization of array, accessing elements of array, I/O of arrays, passing arrays as arguments to a function, strings, I / O of strings, string manipulation functions (strlen, strcat, strcpy, strcmp)

References:

1. V.K. Jain: "*Fundamentals of Information Technology and Computer Programming*", PHI. Latest Edition.

2. Anita Goel: "*Computers Fundamentals*", Pearson Publications

3. Brian Kernighan and Dennis M. Ritchie: "*The C Programming Language*", Prentice Hall, 2nd Edition 2007.

4. K.N.King : "*C Programming : A Modern Approach*", W.W. Norton Company 2nd edition (2008).

5. Herbert Schildt : "*C: The Complete Reference*", Tata Mcgraw Hill Publications 4th edition.

6. Gottfired : "*Programming in ANSI C, Schaum Series*", TMH publications, 2nd Edition (1996).

DAV UNIVERSITY, JALANDHAR

Course Title: Environmental Studies

Paper Code: EVS100

L	T	P	Credits
4	0	0	4

Course Objective: This course aims at understanding the students in aspects of environmental problems, its potential impacts on global ecosystem and its inhabitants, solutions for these problems as well as environmental ethics which they should adopt to attain sustainable development.

Unit- A

The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems

(a) **Forest resources:** Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) **Water resources:** Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

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

(d) **Food resources:** World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) **Energy resources:** Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

(f) **Land resources:** Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Ecosystem:

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession

- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Unit -B

Biodiversity and its conservation

- Introduction – Definition: Genetic, Species and Ecosystem Diversity
- Bio-geographical classification of India
- Value of biodiversity: Consumptive use, Productive use, Social, Ethical, Aesthetic and Option values
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity, global and national efforts.

Environmental Pollution

- Definition, causes, effects and control measures of:

a. Air pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear pollution

- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution

- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

Unit- C

Social Issues and the Environment

- Population growth, variation among nations, Population explosion – Family Welfare Programmes.
- Environment and human health,
- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Laws: The Environment Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981; The Water (Prevention and control of Pollution) Act 1974; The Wildlife Protection Act, 1972; Forest Conservation Act, 1980.
- Issues involved in enforcement of environmental legislation
- Public Awareness

Unit- D

Human Population and Environment

- Population Growth and Variations among Nations
- Population Explosion
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

Field Work

- Visit to a local area to document environmental assets river/ forest/ grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-Pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Suggested Readings:

1. Odum, EP. *Basic Ecology*. Japan: Halt Saundurs, 1983.

2. Botkin, DB, and Kodler EA. *Environmental Studies: The Earth as a living planet.* New York: John Wiley and Sons Inc., 2000.

3. Singh, JS, Singh, SP, and Gupta SR. Ecology, *Environment and Resource Conservation.* New Delhi: Anamaya Publishers, 2006.

4. De, AK. *Environmental Chemistry*. New Delhi: Wiley Eastern Ltd., 1990.

5. Sharma, PD. *Ecology and Environment*. Meerut Rastogi Publications, 2004

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Drawing

Course Code: MEC101A

L	T	P	Credits
2	0	4	4

Course Objectives: Students will be able to use the techniques to interpret the drawings and to use it in the field work of engineering. They will learn various lines, planes, solids and their sectioning and to develop their lateral surfaces. Concepts of orthographic and isometric projections

Unit-A

Drawing Techniques

Introduction to drawing instruments, various types of lines and their convention, principles of dimensioning, Engineering symbols, Gothic lettering in single stroke as per SP-46 code (Vertical and inclined)

Scales

Concept of scaling, construction of plane and diagonal scales

Unit-B

Projection of Points

Concept of plane of projections (Principle planes), First and third angle projections; projection of points in all four quadrants, shortest distance problems

Projection of Lines and Planes

Projection of line parallel to both planes, perpendicular to one plane, inclined to one and both the reference planes and their traces. Plane perpendicular to one plane inclined to one and both the reference planes and their traces. Concept of profile plane and auxiliary planes, To find the true length, α, β, θ and Φ.

Unit-C

Projection of Solids

Right and oblique solids; solids of revolution and polyhedrons, projection of solid with axis perpendicular to one plane and parallel to one or both reference planes. Projection of solid with axis inclined to one or both reference planes.

Sectioning of Solids

Theory of sectioning, types of section planes, their practice on projection of solids, Sectioning by auxiliary planes,to find true section of truncated solids.

Unit-D

Development of Surfaces

Method of Development, Development of surfaces: Parallel line and Radial line method. Development of oblique solids, Development of curved surfaces.

Orthographic and Isometric Views

Draw orthographic views from isometric view or vice-a-versa, Missing line and missing view

References:

1. Jolhe, A.J., "*Engineering Drawing*", Tata McGraw-Hill, New Delhi.
2. Gill, P.S., *"Engineering Drawing"*, S.K. Kataria and Sons, Ludhiana
3. French T.E. and Vierck, C.J., *"Graphic Science"*, McGraw-Hill, New York
4. Zozzora F., *"Engineering Drawing"*, McGraw Hill, New York

DAV UNIVERSITY, JALANDHAR

Course Title: Basic Communication Skills

Course Code: ENG151A

L	T	P	Credits
3	0	0	3

Course Objective:

- To enhance students' vocabulary and comprehensive skills through prescribed texts.
- To hone students' writing skills.

Learning Outcomes: Students will be able to improve their writing skills as well as will enrich their word power.

Unit – A

Applied Grammar (Socio-Cultural Context)

1. Parts of Speech: Noun, Pronoun, Adjective, Verb, Adverb, Preposition, Conjunction, Interjection
2. Tenses (Rules and Usages in Socio-cultural contexts)
3. Modals: Can, Could, May, Might, Will, Would, Shall, Should, Must,
   Ought to
4. Passive/Active
5. Reported/Reporting Speech

Unit – B

Reading (Communicative Approach to be followed)

1. J M Synge: Riders to the Sea   (One Act Play)
2. Anton Chekhov : Joy   (Short Story)
3. Swami Vivekanand : The Secret of Work (Prose)

Unit – C

Writing

1. Essay Writing and Letter Writing
2. Report Writing
3. Group Discussion & Facing an Interview

References:

a. Books

1. Kumar, Sanjay and PushpLata. *Communication Skills.* India: OUP, 2012. Print.

2. Vandana, R. Singh. *The Written Word* by. New Delhi: Oxford University Press, 2008. Print.

b. Websites

1. www.youtube.com (to download videos for panel discussions). Web.
2. www.letterwritingguide.com. Web.
3. www.teach-nology.com.Web.
4. www.englishforeveryone.org.Web.
5. www.dailywritingtips.com.Web.
6. www.englishwsheets.com.Web.
7. www.mindtools.com.Web.

DAV UNIVERSITY, JALANDHAR

Course Title: Chemistry Lab

Course Code: CHE152

L	T	P	Credits
0	0	2	1

Course Objectives:

This course is intended to learn the basic concepts of Engineering Chemistry Laboratory. The present syllabus has been framed as per the recent research trends in the subject. The various experiments have been designed to enhance laboratory skills of the undergraduate students.

Expected Prospective:

The students will be able to understand the basic objective of experiments in Engineering chemistry, properly carry out the experiments, and appropriately record and analyze the results through effective writing and oral communication skills. They will know and follow the proper procedures and regulations for safe handling and use of chemicals.

List of Practicals:

1. Verify Lambert Beer's law using spectrophotometer and $CoCl_2$ or $K_2Cr_2O_7$ solution.
2. Determine the strength of HCl solution by titrating against NaOHsolutionconductometerically.
3. Determination of the strength of HCl solution by titrating against NaOH using pH meter.
4. Determination of total hardness of water (tap) using standard EDTA solution and Eriochrome black T indicator.
5. Determination of alkalinity of water.
6. Determination of surface tension of given liquid by using Stalagmometer.
7. Determination of residual chlorine in a water sample.
8. Determination of Flash & Fire point of given a given lubricating oil by Pensky-Marten's apparatus.
9. Determination of the viscosity of given lubricating oil by using Redwood Viscometer.
10. Preparation of a polymer phenol/urea formaldehyde resin.
11. Determination of moisture, volatile matter and ash content in a given sample of coal by proximate analysis.
12. Determination of dissolved oxygen present in given sample of water.

References:

1. Levitt, B.P. Findlay's Practical Physical Chemistry, 9th edition, Longman Group Ltd., 1973.

2. Yadav, J.B. Advanced Practical Physical Chemistry.

3. Vogel, A. I. A textbook of Quantitative Inorganic Analysis, Longman Gp. Ltd, 4th edition (2000).

DAV UNIVERSITY, JALANDHAR

Course Title: Computer Fundamentals and Programming Lab
Course Code: CSE103

L	T	P	Credits
0	0	2	1

Instruction for Students: The students will be attending a laboratory session of 2 hours weekly and they have to perform the practical related to the following list.

1. Practical know-how of various internal and external Hardware components of a computer (including basic working of peripheral devices).
2. Introduction to Operating Systems; installing Windows; basics of windows.
3. Working knowledge of Internet.
4. Introduction to word processor and mail merge.
5. Introduction to MS-Excel.
6. Working on MS-PowerPoint.
7. Introduction to basic structure of C program, utility of header and library files.
8. Implementation of program related to the basic constructs in C
9. Programs using different data types in C
10. Programs using Loops and Conditional Statements in C
11. Programs using functions by passing values using call by value method.
12. Programs using functions by passing values using call by reference method.
13. Programs using arrays single dimension in C.
14. Program to implement array using pointers
15. Programs related to string handling in C

DAV UNIVERSITY, JALANDHAR

Course Title: Basic Communication Skills Lab

Course Code: ENG152

L	T	P	Credits
0	0	2	1

Course Objective:

- To improve fluency in speaking English.
- To promote interactive skills through Group Discussions and role plays.

Learning Outcome: Students will get exposure to speaking through the above mentioned interactive exercises. In addition, they will develop a technical understanding of language learning software, which will further improve their communicative skills.

Unit – A Speaking/Listening

1. Movie-Clippings   (10 Hrs)
2. Role Plays   (10 Hrs)
3. Group Discussions   (10 Hrs)

References:

1. Gangal, J. K. *A Practical Course in Spoken English.* India: Phi Private Limited, 2012. Print.
2. Kumar, Sanjay and PushpLata. *Communication Skills*. India: OUP, 2012. Print.

Websites

1. www.youtube.com (to download videos for panel discussions).Web.
2. www.englishforeveryone.org.Web.
3. www.talkenglish.com.Web.
4. www.mindtools.com.Web.

DAV UNIVERSITY, JALANDHAR

SECOND SEMESTER

Course Title: Engineering Mathematics-II

Course Code: MTH152A

L	T	P	Credits
3	1	0	4

Objective:

The objective of the course is to equip the students with the knowledge of concepts of vectors and geometry and their applications. A flavour of pure mathematics is also given to the readers.

Unit-A

Functions of Complex Variables: Complex Numbers and elementary functions of complex variable De-Moivre's theorem and its applications. Real and imaginary parts of exponential, logarithmic, circular, inverse circular, hyperbolic, inverse hyperbolic functions of complex variables.Summation of trigonometric series. (C+iS method).

Unit-B

Integral Calculus: Rectification of standard curves; Areas bounded by standard curves; Volumes and surfaces of revolution of curves;

Multiple Integrals: Double and triple integral and their evaluation, change of order of integration, change of variable, Application of double and triple integration to find areas and volumes. Centre of gravity and Moment of inertia

Unit-C

Vector Calculus: Scalar and vector fields, differentiation of vectors, velocity and acceleration.

Vector differential operators: Del, Gradient, Divergence and Curl, their physical interpretations. Line, surface and volume integrals.

Application of Vector Calculus: Flux, Solenoidal and Irrotational vectors. Gauss Divergence theorem.Green's theorem in plane, Stoke's theorem (without proofs) and their applications

Unit-D

Infinite Series: Convergence and divergence of series, Tests of convergence (without proofs): Comparison test, Integral test, Ratio test, Raabe's test, Logarithmic test, Cauchy's root test and Gauss test. Convergence and absolute convergence of alternating series, Uniform Convergence and Power Series

References:

1. Grewal, B.S., *Higher Engineering Mathematics*. New Delhi: Khanna Publication, 2009

2. Kreyszig, Erwin, *Advanced Engineering Mathematics*. New Delhi: Wiley Eastern Ltd., 2003.

3. Jain, R K, and K Iyengar S R., *Advanced Engineering Mathematics*, New Delhi: Narosa Publishing House, 2003.

4. Thomas, George B. and Finney Ross L., *Calculus and Analytic Geometry*. New Delhi Addison Wesley, 1995

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Physics

Course Code: PHY151A

L	T	P	Credits
4	0	0	4

Total Lecture: 60

Course Objective: The aim of this course on physics is to make the student of engineering understand the basic concepts of physics which will form the basis of certain concept in their respective fields.

Unit-A

PHYSICAL OPTICS:

Interference: Division of wave front, Fresnel's biprism, division of amplitude, Newton's rings and applications.

Diffraction:

Difference between Fraunhofer and Fresnel diffraction, Fraunhofer diffraction through a slit, plane transmission diffraction grating, its dispersive and resolving power.

Polarization: Polarised and unpolarised light, double refraction, Nicol prism, quarter and half wave plates.

Unit-B

LASER: Spontaneous and stimulated emission, Laser action, Characteristics of laser beam, concept of coherence, HeNe laser, Semiconductor lasers and applications

FIBRE OPTICS: Propagation of light in fibres, numerical aperture, single mode and multimode fibres, applications

Unit-C

DIELECTRICS:

Molecular Theory, polarization, displacement, susceptibility, dielectric coefficient, permittivity, relations between electric vectors, Gauss's law in the presence of a dielectric, energy stored in an electric field, Behaviour of dielectric in alternating field and ClausiusMossotti equation.

Unit-D

QUANTUM MECHANICS:

Difficulties with Classical physics, Introduction to quantum mechanics simple concepts, Black Body radiation, Planck's Law of radiation and its limitations, Group velocity and phase velocity, Schrodinger's wave equations and their applications.

SUPER CONDUCTIVITY:

Introduction (experimental survey), Meissner effect, Type I and type II superconductors, London equation, Elements of BCS theory, Applications of superconductors.

Reference Books:

1. Sear, F.W. *Electricity and Magnetism.* London: Addison-Wesley, 1962.
2. Resnick and Halliday. *Physics.*New York: Wiley, 2002.
3. Lal,B. and Subramanyam, N.*A Text Book of Optics.* New Delhi: S. Chand and Company Limited, 1982.
4. Jenkins, and White. *Fundamental of Physical Optics*. New York: Tata McGraw-Hill, 1937.
5. Griffiths,D*. Introduction to Electrodynamics,* New Delhi: Prentice Hall, 1998.
6. Beiser, A. *Perspective of Modern Physics.* New Delhi: McGraw Hill Ltd., 2002.

DAV UNIVERSITY, JALANDHAR

Course Title: **Mechanical Engineering Fundamentals**

Course Code: MEC103

L	T	P	Credits
4	0	0	4

Course Objectives:

To impart the basic knowledge of thermodynamic principles, design principles, power transmission devices, power producing and power absorbing devices.

Unit-A

Fundamental Concepts of Thermodynamics

Introduction, Thermodynamic System and its types, Boundary and its types, Surroundings, Thermodynamic properties, State, Path, process and cycles, Thermodynamic Equilibrium, Working Substance, Microscopic and Macroscopic Analysis, Units and Dimensions, Quasi Static Process, Reversible and Irreversible processes, Point Function and Path Function, Mechanical and Thermodynamic work, P-dv Work (Displacement Work), Work is a Path Function, Equations for work done in various processes

Laws of Thermodynamics

Zeroth law of Thermodynamics, Temperature, Thermometry (Measurement of temperature), Temperature Scales, Energy, Potential and Kinetic Energies at Micro and Macro Level, Internal Energy, Law of conservation of energy, Joule's Experiment, First law of thermodynamics (Open and Closed System), Energy – A property of system, Enthalpy, Entropy, Heat, Heat vs Temperature, specific heat, Heat Capacity, Specific heat at constant volume, Specific heat at constant pressure, Adiabatic Index, Limitations of first law of thermodynamics

Unit-B

Pressure

Pressure Concept and Definition, Pressure conversion Table, Atmospheric pressure, Standard Atmospheric Pressure, Gauge Pressure, Vacuum Pressure, Absolute pressure, Properties of fluid, Pressure head of a Liquid, Pascal's Law, Pressure measurement: Mechanical Gauges and Manometers, Mechanical Gauges: (Bourdon tube pressure gauge, Diaphragm pressure gauge, Dead weight), Manometers: (Principle/Advantage/Limitation/ Classification), Piezometer, Single U tube manometer (Numerical for Vacuum and Gauge pressure), [Simple problems on above topics]

Heat Transfer

Introduction, Heat Transfer vs Thermodynamics, Applications, Thermal Conductivity, Thermal Resistance, Modes of heat transfer, Spectrum of electromagnetic radiation, Surface emission

properties, Absorptivity, Reflectivity and Transmissivity, Fourier law, Newton's law of cooling, Stefan Boltzmann's Law, Heat Exchangers (Applications, Selection, Classification), Thermal Insulation (Properties of insulation, Types of Insulations, Thermal Insulating Materials)

Power Absorbing Devices

Power Absorbing Devices, Difference between Hydraulic pump, Air compressor, Fan, Blower, Pump (Function, Selection, Applications), Classification of Pump, Positive displacement and Dynamic Pumps, Reciprocating Pumps and its types, Rotary Pumps and its types, Centrifugal Pump, Axial Pump

Unit-C

Power Producing Devices Boiler

States of matter, Changing State of Matter, Sublimation, Effect of temperature during change of Phase, Steam boiler, Application, Classification of boilers, Types of boilers (Brief Description), Essentials of a good boiler, Advantages of superheating the steam, Comparison between Water tube and Fire tube boilers, Function of boiler Mountings and Accessories

Turbines

Turbine, Classification based on working fluid, Classification of hydraulic turbines, Selection of hydraulic turbines, Impulse Turbines (Pelton Wheel/ Turgo/ Cross Flow), Reaction Turbines (Francis/ Kaplan/ Propeller)

Internal Combustion Engines

Heat Engine, Types of Heat Engine, Advantages, Disadvantages and Applications, Classification of IC Engine, Engine Components (Location, Function and Material), Basic Terminology used in IC engine, Four stroke Cycle Engines (SI and CI), Two stroke Cycle Engines (SI and CI)

Unit-D

Principles of Design

Need of design, Product Life Cycle, Material properties and selection, Factors affecting material selection, Stress and Strain and its types, Hooke's law, Modulus of Elasticity, Longitudinal and Lateral Strain, Poisson's ratio, Stress- Strain Curve for ductile material and brittle material, Factor of Safety, Centre of Gravity, Centroid, Centroid of areas of plain, Figures (Without Derivation), Centroid of areas of composite sections (Without Derivation), Moment of Inertia, Radius of gyration, Theorem of perpendicular axis, Theorem of parallel axis, MI of L, I and T sections, [Simple problems on above topics]

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Power Transmission Devices and Machine Elements

Individual and group drive system (advantages and Disadvantages), Belt drive (Types: V and Flat Belts and their Applications, Advantages and Disadvantages), Ropes drive (Types: Fiber and Wire Ropes and their Applications, Advantages and Disadvantages), Chain drive (Applications, advantages and Disadvantages, Sprockets), Gear drive (Types of Gears), Power transmission shafts, Types of shafts, Application of shafts, Axle, Keys (Function, Classification), Coupling (Function, Classification: Rigid and Flexible), Flanged coupling, Oldham's coupling, Universal coupling, Bearings and their types, Flywheel construction and types

References:

1. Rajan T.S. *Basic Mechanical Engineering*, New Delhi: New Age Publishers.
2. Singh Sadhu *Principles of Mechanical Engineering*, New Delhi: S Chand Publishers.
3. Shankar V.P., *Basic Mechanical Engineering*, New Delhi: Laxmi Publishers.
4. Phthak G. K., *Basic Mechanical Engineering*, New Delhi: Rajsons Publications.
5. Kumar Parveen, *Basic Mechanical Engineering*, New Delhi: Pearson Education

DAV UNIVERSITY, JALANDHAR

Course Title: Electrical and Electronics Technology

Course Code: ELE101

L	T	P	Credits
4	0	0	4

Unit-A

D.C Circuit Analysis:

Voltage source, current source, dependent and independent sources, analysis of D.C circuit by KCL and KVL , Nodal and Mesh analysis, The venin theorem , Norton theorem, superposition theorem, Maximum Power Transfer Theorem

Unit-B

A.C Circuit Analysis:

Review of single phase A.C. circuit under sinusoidal steady state, solution of R.L.C. Series circuit, the j operator, complex representation of impedance, solution of series and parallel circuit, series and parallel resonance, 3 phase A.C. Circuit, star and delta connections, line and phase quantities solution of 3 phase circuits, balance supply voltage and balanced supply voltage and balance load, phasor diagram, measurement of power and power factor by two wattmeter method.

Unit-C

Magnetic Circuit:

Review of laws of electromagnetism, Flux, MMF and their relation. Comparison of   electrical and magnetic circuit, B-H Curve, saturation leakage and fringing.Analysis of series and parallel magnetic circuit, AC Excitation in magnetic circuits, Hysteresis and eddy currents.

Transformers:

Single phase transformer, basic concepts constructional detail, type, voltage current and impedance Transformation, phasor diagram, equivalent circuit, voltage regulation, oc/sc test, losses and efficiency concept of All day efficiency , autotransformer.

Unit-D

Rotating Electrical Machines:

Basic concepts, working principle and general construction of DC machines (motor/generators), torque and EMF expression

Basic Electronics:

P-Type and N-Type semiconductor, concept of diode, transistor and their application, introduction to OPAMP, application of op amp as a subtractor , summer, differentiator, integrator, logic gates AND ,OR, NOT, NOR, NAND etc.

References:

1. M.S. Sukhija, T.K. Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford University Press, 2012.

2. Ashfaq Husain, HarsoonAshfaq, " Fundamentals of Electrical Engineering, 4th Edition, Dhanpat Rai and Co., 2013

3. V.N. Mittle, "Basic Electrical Engineering", 2nd Edition, Tata McGraw Hill Publication.

4. B.L. Theraja, A.K. Theraja, " A Text Book of Electrical Technology, Volume-1, S. Chand Publication

5. Debashisha Jena, "Basic Electrical Engineering", 1st edition, Wiley India Publication, 2012.

6. B.L. Theraja, R.S. Sedha, " Principles of Electric Devices and Circuits", S. Chand Publication, 1st edition, 2006

DAV UNIVERSITY, JALANDHAR

Course Title: Human Values and General Studies

Course Code: SGS107

L	T	P	Credits
4	0	0	4

Course Objectives

a) To sensitize students about the role and importance of human values and ethics in personal, social and professional life.

b) To enable students to understand and appreciate ethical concerns relevant to modern lives.

c) To prepare a foundation for appearing in various competitive examinations

d) To sensitize the students about the current issues and events of national and international importance

e) To provide opportunity to the students to study inter disciplinary subjects like Geography, Science, Economy, Polity, History, International Relations etc.

Unit-A

Human Values

1. **Concept of Human Values:** Meaning, Types and Importance of Values.

2. **Value Education :** Basic guidelines for value education

3. **Value crisis and its redressal**

Being Good and Responsible

1. Self Exploration and Self Evaluation

2. Acquiring Core Values for Self Development

3. Living in Harmony with Self, Family and Society

4. Values enshrined in the Constitution: Liberty, Equality

5. Fraternity and Fundamental Duties.

Unit-B

Value – based living

1. Vedic values of life

2. *Karma Yoga* and *Jnana Yoga*

3. *AshtaMarga* and *Tri-Ratna*

Ethical Living:

1. Personal Ethics

2. Professional Ethics

3. Ethics in Education

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Unit-C

General Geography

World Geography

The Universe, The Solar System, The Earth, Atmosphere, The World we live in, Countries rich in Minerals, Wonders of the World, Biggest and Smallest.

Indian Geography

Location, Area and Dimensions, Physical Presence, Indian States and Union Territories, Important sites and Monuments, Largest-Longest and Highest in India.

General History

Glimpses of India History, Ancient Indian, Medieval India, Modern India, Various Phases of Indian National Movement, Prominent Personalities, Glimpses of Punjab history with special reference to period of Sikh Gurus

Glimpses of World History

Important Events of World History, Revolutions and Wars of Independence, Political Philosophies like Nazism, Fascism, Communism, Capitalism, Liberalism etc.

Indian Polity: Constitution of India

Important Provisions, Basic Structure, Union Government, Union Legislature and Executive, State Government: State Legislature and Executive, Indian Judiciary, The Election Commission, Panachayati Raj System, RTI etc.

General Economy

The process of liberalization, privatization, globalization and Major World Issues, Indian Economy, Indian Financial System, Major Economic Issues, Economic Terminology.

Unit-D

General Science

General appreciation and understandings of science including the matters of everyday observation and experience, Inventions and Discoveries

Sports and Recreation

The World of Sports and recreation, Who's Who is sports, Major Events, Awards and Honours. Famous personalities, Festivals, Arts and Artists

Current Affairs

National and International Issues and Events in News, Governments Schemes and Policy Decisions

DAV UNIVERSITY, JALANDHAR

Miscellaneous Information

Who is who

Books and Authors, Persons in News, Awards and Honours, Abbreviations and Sports

References:

1. Human Values, A N Tripathi, New Age International Publishers, New Delhi, Third Edition, 2009

2. Professional Ethics, R. Surbiramanian, Oxford University Press, New Delhi, 2013.

3. Human Values and Professional Ethics, RishabhAnand, SatyaPrakashan, New Delhi, 2012

4. Human Values and Professional Ethics, Sanjeev Bhalla, SatyaPrakashan, New Delhi, 2012.

5. Human Values and Professional Ethics, RituSoryan Dhanpat Rai & Co. Pvt. Ltd., First Edition, 2010.

6. Human Values and Professional Ethics by Suresh Jayshree, Raghavan B S, S Chand & Co. Ltd. , 2007.

7. Human Values and Professional Ethics, Yogendra Singh, AnkurGarg, Aitbs publishers, 2011.

8. Human Values and Professional Ethics, Vrinder Kumar, Kalyani Publishers, Ludhiana, 2013.

9. Human Values and Professional Ethics, R R Gaur, R. Sangal, GP Bagaria, Excel Books, New Delhi 2010.

10. Values and Ethics, Dr.BramwellOsula, Dr.SarojUpadhyay, Asian Books Pvt. Ltd., 2011.

11. Indian Philosophy, S. Radhakrishnan, George Allen &Unwin Ltd., New York: Humanities Press INC, 1929.

12. Essentials of Hinduism, Jainism and Buddhism, A N Dwivedi, Books Today, New Delhi – 1979

13. Dayanand : His life and work, SurajBhan, DAVCMC, New Delhi – 2001.

14. Esence of Vedas, KapilDevDwivedi, Katyayan Vedic SahityaPrakashan, Hoshiarpur, 1990.

15. Vedic Concepts, Prof. B BChaubey, Katyayan Vedic SahityaPrakashan, Hoshiarpur, 1990.

16. Advance Objective General Knowledge, R. S. Aggarwal, S. Chand Publisher (2013)

17. Concise General Knowledge Manual 2013, S. Sen, Unique Publishers,2013

18. Encyclopedia of General Knowledge and General Awareness by R P Verma, Penguin Books Ltd (2010)

19. General Knowledge Manual 2013-14, Edgar Thorpe and Showick Thorpe, The Pearson, Delhi.

20. General Knowledge Manual 2013-14, MuktikantaMohanty, Macmillan Publishers India Ltd., Delhi.

21. India 2013, Government of India (Ministry of Information Broadcasting), Publication Division, 2013.

22. Manorama Year Book 2013-14, MammenMethew, Malayalam Manorama Publishers, Kottayam, 2013.

23. Spectrum's Handbook of General Studies – 2013-14, Spectrum Books (P) Ltd., New Delhi

CURRENT AFFAIRS

Magazines

Economic and Political Weekly, Yojna, the Week, India Today, Frontline, Spectrum.

Competition Success Review, Competition Master, Civil Services Chronicle, Current Affairs, World Atlas Book

Newspapers

The Hindu, Times of India, The Hindustan Times, The Tribune

DAV UNIVERSITY, JALANDHAR

Course Title: **Manufacturing Practice**

Course Code: MEC104

L	T	P	Credits
0	0	4	2

Course Objective:

1. Know basic workshop processes, Read and interpret job drawing.

2. Identify, select and use various marking, measuring, holding, striking and cutting tools & equipment's

3. Operate and control different machines and equipment's.

CARPENTRY SHOP

a) Preparation of half lap joint

b) Preparation of Mortise and Tenon Joint

c) Preparation of a Dove & Tail joint

d) To prepare a White board duster

Welding Shop:

a) Preparation of Joint by Arc Welding

b) Preparation of Joint by using Gas Welding

c) Preparation of Joint by MIG/ TIG Welding

d) Preparation of Joint by Spot/ Seam Welding

Smithy Shop

a) To Forge the L – Hook

b) To Forge a Chisel

c) To Forge a Cube from a M.S Round

d) To forge a screw driver

Fitting Shop

a) Filing a dimensioned rectangular or square piece and prepare a sq. fitting

b) Preparation of T fitting male part

c) Preparation of U fitting Female part

d) Internal thread Cutting in Square piece and external thread cutting on a rod and assembling as a paper weight

Foundry Shop:

a) To make a Mould of solid pattern

b) To prepare a mould of sleeve fitting using gating system

c) To make a Mould of Split Pattern using Cope & Drag

d) To check the Hardness of the Mould

To check the Moisture Content in the Molding Sand

To check the Compressive Strength of Molding Sand

Sheet-Metal Shop

a) Preparation of a funnel from G.I. sheet

b) Preparation of a book rack stand from G.I. Sheet

c) Preparation of a leak proof tray with inclined edges from G.I. Sheet

d) Preparation of a square pen stand from G.I. Sheet with riveting at corners

Machine Shop

a) To make a job using step turning and grooving

b) To make a job using knurling and threading

c) To make a multi operation job on a Lathe machine

d) To make V – slot by using shaper machine

Electrical Shop

a) Layout of electrical tube light wiring

b) Layout of stair case wiring using two way switch

c) Testing and rectification of simulated faults in electrical appliances such as 'Electric Iron' Ceiling Fan. Electric kettle

d) To fabricate a circuit for the electrical wiring of, Fan with regulator and Bulb through a main switch and its testing using a series lamp

References:

1. Johl K. C., "Mechanical Workshop Practice", Prentice Hall India, 1st Edition.
2. Bawa H.S., "Workshop Technology", Tata McGraw Hill, 7th Edition.

DAV UNIVERSITY, JALANDHAR

Course Title: Engineering Physics Lab

Course Code: PHY152

L	T	P	Credits
0	0	2	1

Objective: The laboratory exercises have been so designed that the students learn to verify some of the concepts learnt in the theory courses. They are trained in carrying out precise measurements and handling sensitive equipments.

Note:

- Students are expected to perform at least eight-ten experiments out of following list. The experiments performed in first semester cannot be repeated in second Semester.
- The examination for both the courses will be of 3 hours duration

List of Experiments:

Experimental skills: General Precautions for measurements and handling of equipment, representation of measurements, Fitting of given data to a straight line, and Error analysis, Significant figures and interpretation of results.

1. To determine the Refractive Index of the Material of a given Prism using Sodium Light.
2. To determine the Dispersive Power and resolving power of the Material of a given Prism using Mercury Light.
2. To determine wavelength of sodium light using Fresnel Biprism.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determination Wavelength of Sodium Light using Michelson's Interferometer.
5. To determine the wavelength of Laser light using Diffraction of Single Slit.
6. To determine the wavelength of (1) Sodium and (2) Mercury Light using Plane Diffraction Grating.
7. To determine the (1) Wavelength and (2) Angular Spread of HeNe Laser using Plane Diffraction Grating.
8. To study the wavelength of spectral lines of sodium light using plane transmission grating.
9. To study the specific rotation of sugar solution Laurent's half shade polarimeter method
10. To study the numerical aperture and propagation losses using HeNe laser Optical fibre set up.
11. To compare the focal length of two lenses by Nodal slide method.
12. To find the unknown low resistance by Carey Foster bridge.

13. To determine the beam divergence of the HeNe laser.

14. To study the Meissner's effect in superconducting sample.

15. To study the Faraday law of electromagnetic induction.

16. To study the capacitance by flashing/quenching of Neon bulb kit

17. To compare the two unknown capacitances of two capacitors by using DeSauty's bridge.

18. To find our out the unknown inductance by using the Anderson's bridge method.

19. To study the numerical aperture and propagation losses for He-Ne laser by using the optical fibre set up for

20. To study the Planck's constant by using photoelectric cell method.

DAV UNIVERSITY, JALANDHAR

Course Title: Electrical and Electronics Technology Lab
Course Code: ELE102

L	T	P	Credits
0	0	2	1

List of Experiments

1. To verify Ohm's Law, Kirchhoff's Current Law and Kirchhoff's Voltage Law.
2. To verify Thevenin's and Norton's theorems.
3. To verify Superposition theorem.
4. To verify Maximum Power Transfer theorem.
5. To study frequency response of a series R-L-C circuit and determine resonant frequency and Q-factor for various values of R, L and C
6. To study frequency response of a parallel R-L-C circuit and determine resonant frequency and Q-factor for various values of R, L and C.
7. To perform direct load test of a transformer and plot efficiency versus load characteristics.
8. To perform open circuit and short circuit test on transformer.
9. To perform speed control of DC motor.
10. Measurement of power in a three phase system by two wattmeter method.
11. To plot the V-I characterics of PN-junction diode.
12. To verify the truth table of logic gates.

DAV UNIVERSITY, JALANDHAR

THIRD SEMESTER

Course Title: ENGINEERING MATHEMATICS-III
Course Code: MTH-252

L	T	P	Credits
4	1	0	4

Course Objective:
The objective of the course is to enable the students to understand the basic concepts related to Laplace transforms, Fourier series, ordinary differential and partial differential equations and their applications.

PART-A

Laplace Transforms
Laplace transforms of various standard functions, Linear property of Laplace transforms, Shifting property and change of scale, inverse Laplace transforms, transform of derivatives and integrals, Laplace transform of unit step function, impulse function, periodic functions, applications to solution of ordinary linear differential equations with constant coefficients, and simultaneous differential equations. **[14]**

PART-B

Fourier series
Periodic functions, Euler's formula. Dirichlet's conditions.Fourier series of discontinuous functions. Fourier series of Even and Odd functions, half range expansions, Fourier series of different wave forms, Complex form of Fourier series. Fourier Transformation. **[14]**

PART-C

Partial Differential Equations
Formulation of partial differential equations, Linear partial differential equations, homogeneous partial differential equations with constant coefficients.Wave equation and Heat conduction equation in one dimension.Two dimensional Laplace equation and their applications, solution by the method of separation of variables. **[14]**

PART-D

Functions of Complex Variable
Limits, continuity and derivative of the function of complex variable, Analytic function, Cauchy-Riemann equations, conjugate functions, and harmonic functions.
Conformal Mapping
Definition, standard transformations, translation, rotation, inversion, bilinear.
Complex Integration
Line integrals in the complex plane, Cauchy's theorem, Cauchy's integral formula and derivatives of analytic function.Taylor's and Laurent's expansions (without proofs), singular points, poles, residue, Integration of function of complex variables using the method of residues. **[14]**

REFERENCES:-

1. Kreyzig E.: "Advanced Engineering Mathematics", New Delhi:John Wiley and Sons, 2008
2. Ponnusamy S.: "Foundations of Complex Analysis", Narosa Publishers, 2002.
3. Sneedon I.N.: "Elements of Partial Differential Equations", McGraw-Hill, 2005
4. Grewal B.S. "Higher Engineering Mathematics", Khanna Publishers, 2007.

DAV UNIVERSITY, JALANDHAR

Course Title: PRINCIPLES OF SURVEYING

L	T	P	Credits
3	0	0	3

Paper Code: CIV201

Course Objective: This course offers a good understanding of the various surveying techniques.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various methods of surveying, basic principle of surveying and various types of instruments used in surveying.

Part-A

Introduction: Definition, classification of surveys, principle, distorted or shrunk scales, precision in surveying. **[4]**

Linear Measurement: Instruments for measuring distances, chains, tapes, ranging, errors in linear measurement, corrections for linear measurements for chains and tapes Obstacle in chaining, reconnaissance, station selection, Triangulation, Base line measurement, limiting length of offsets, field note [6]

Part-B

Compass Surveying: Instruments used in traversing, bearings, meridians, declination, dip of magnetic needle, bearing of lines from included angles, local attraction, closing error and its removal. **[6]**

Plane Table Surveying: Introduction to plane table surveying, principle, instruments, working operations, setting up the plane table, centering, levelling, orientation, methods of plane table survey, two and three point problems, Lehmann's Rules, errors. **[6]**

Part-C

Leveling: Definitions of terms used in leveling, different types of levels, parallax, adjustments, bench marks, classification of leveling, booking and reducing the levels, rise and fall method, line of collimation method, errors in leveling, permanent adjustments, corrections to curvature and refraction, setting out grades, longitudinal leveling, and profile leveling. Automatic Level **[8]**

Theodolite: Types of theodolite, measurement of angles, temporary and permanent adjustments, closed & open traverse, consecutive and independent co-ordinates, advantages and disadvantages of traversing, Latitudes and Departures, closing error, Bowditch & Transit Rules, Gales traverse table, Different cases of omitted measurements. **[6]**

Part-D

Contouring: Definition, representation of reliefs, horizontal equivalent, contour interval, characteristics of contours, methods of contouring, contour gradient, Interpolation of contours, uses of contour maps. **[8]**

REFERENCE:

1. Punmia B C "*Surveying*" Vol.1 & 2 Laxmi Publications Pvt. Ltd., New Delhi, 2002.
2. Kanetkar T P and Kulkarni S V "*Surveying and leveling*" Vol. I & II PVG Prakashan, Pune, 1994.
3. Basak N N "*Surveying and leveling*" Tata McGraw Hill, New Delhi, 2000.
4. Bhavikatti,S.S. "*Surveying & Levelling*" Volume I&II 2009.
5. Duggal, S.K., "*Surveying*"Vol I & II, Tata McGraw Hill 2007.
6. Narinder Singh, "*Surveying*", Tata McGraw Hill 1994.

DAV UNIVERSITY, JALANDHAR

Course Title: **HYDRAULICS ENGINEERING-1**

L	T	P	Credits
4	1	0	4

Paper Code: CIV203

Course Objective: This course offers a good understanding of the various properties of fluid like dynamic and kinematic properties.

Learning Outcomes: After the completion of this course the participants would gain the knowledge about various types of flow, fluid properties like Fluid Kinematics and fluid dynamics.

Part-A

Fluid and their properties : Concept of fluid, difference between solids, liquids and gases; ideal and real fluids; Continuum concept of fluid: density, specific weight and relative density; viscosity and its dependence on temperature; surface tension and capillarity, vapor pressure and cavitation's, compressibility band bulk modulus; Newtonian and non-Newtonian fluids   [6]

Fluid Statics: Concept of pressure, Pascal's law and its engineering hydrostatic paradox.Action of fluid pressure on plane (horizontal, vertical and inclined) submerged surface, resultant force and centre of pressure, force on a curved surface due to hydrostatic pressure. Buoyancy and flotation, stability of floating and submerged bodies, Meta centric height and its determination.   [8]

Part-B

 Fluid Kinematics: Classification of fluid flows, velocity and acceleration of fluid particle, local and convective acceleration, normal & tangential acceleration streamline, pathline and streakline, flow rate and discharge mean velocity continuity equation in Cartesian co-ordinates. Rotational flows-Rotational velocity and circulation, stream & velocity potential function   .   [12]

Part-C

Fluid Dynamics :- Euler's equation, Bernoulli's equation and steady flow energy equation; representation of energy changes in fluid system, impulse momentum equation, kinetic energy and momentum correction factors, flow along a curved streamline, free and forced vortex motion.   [10]

Part-D

Dimensional Analysis and Similitude: Fundamental and derived units and dimensions, dimensional homogeneity, Rayleigh's and Buckingham's Pi method for dimensional analysis, dimension less number and their significance, geometric, kinematic and dynamic similarity, model studies.   [4]

Flow Past immersed bodies: Drag and lift deformation Drag and pressure drag. Drag on a sphere, cylinder and Air foil: lift-Magnus Effect and circulation lift on a circular cylinder.   [4]

Flow Measurement: - Manometers, Pitot tubes, venture meter and orifice meters, orifices, mouthpieces, notches **(Rectangular and V-notches)** and weirs **(Sharp crested Weirs)**.   [4]

REFERENCES:

1. Bansal R.K., "*Fluid Mechanics & Hydraulic Machines*" Laxmi Publications Ltd. 2005.
2. ModiP.N. &Seth S.M., "Hydraulic and Fluid Mechanic". Standard Book House, New Delhi, 1991.
3. GardeR.J. &MirajgaokerA.G., "Engineering Fluid Mechanics" Nem Chand Publishers, Roorkee,1965.
4. Munson Young okiishi, "Fundamentals of fluid mechanics", by Wiley Publisher 1997.
5. VL & Wylie EB, "Fluid Mechanics: Streetes", Mcgraw Hill book company 2003
6. Chow, "Fluid Mechanics", IBH publisher 2001.
7. Subramanean, "Open Channel flow", Mcgraw Hill book company, 1997.

DAV UNIVERSITY, JALANDHAR

Course Title: ENVIRONMENT ENGINEERING-1

L	T	P	Credits
3	0	0	3

Paper Code: CIV205

Course Objective: This course offers a good understanding of the various water supply techniques used in modern life, various types of distribution systems.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various water supply systems as well as about the quality tests for water.

Part-A

Public Water Supply: Beneficial uses of water, water demand, per capita demand, variation in demand, causes, detection and prevention of wastage of water, population forecasting, and water demand for firefighting, water demand estimation   **[6]**

Water sources and development: Surface and ground water sources, Selection and development of sources, Flow measurement in closed pipes, intakes and transmission systems.   **[4]**

Part-B

Quality and testing of Water: Impurities in water, sampling of water, physical, chemical and bacteriological water quality parameters, drinking water specifications (IS:10500).   **[4]**

Water treatment: Water treatment schemes; Basic principles of water treatment; Design of plain sedimentation, coagulation and flocculation, filtration – slow, rapid and pressure; Disinfection units; Fundamentals of water softening, fluoridation and deflouridation, and water desalination and demineralization, taste and odour removal, miscellaneous methods of water treatment.   **[8]**

Part-C

Transportation of Water: Pipes for transporting water and their design, water distribution systems and appurtenances; Water supply network design and design of balancing and service reservoirs; operation and maintenance of water supply systems.   **[6]**

Pumps and pumping stations: Types of pumps and their characteristics and efficiencies; Pump operating curves and selection of pumps; pumping stations.   **[4]**

Part-D

Rural water supply: Principles, selection of source, rain water harvesting, quantitative requirements, low cost treatment techniques.   **[6]**

Pollution: Air pollution, Noise Pollution causes, effects and preventions   [4]

REFERENCES:

1. Punmia B. C., Jain Ashok, Jain A. "Water Supply Engineering- Environmental Engg. (Vol. – I)" by,Laxmi Publications, New Delhi,1994.
2. Arcadio P. Sincero and Gregoria P. Sincero"EnvironmentalEngg. - A design Approach" , Prentice Hall of India, New Delhi, 2000.
3. Howard S. Peavy, Donald R. Rowe & George Tchobanoglous"EnvironmentalEngg." McGraw Hill, International Edition, 2001.
4. Garg S. K., "Water Supply Engineering- Environmental Engg. (Vol. – I)", Khanna Publishers, Delhi, 1970.
5. Steel EW and McGhee, Terence J. "Water Supply and Sewerage" , McGraw Hill, 2002.

DAV UNIVERSITY, JALANDHAR

Course Title: BUILDING MATERIAL AND CONSTRUCTION

Paper Code: CIV207

L	T	P	Credits
3	0	0	3

Course Objective: This course offers a good understanding and study of different materials and material properties in civil engineering.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various materials used in construction, their properties, uses and type of construction work for which they can be used.

Part-A

Building Stones: General, Uses of stones, natural bed of stones, qualities of a good building stone, deterioration of stones, preservation of stones, artificial stones, common building stones of India and their uses. [4]

Bricks: General, Composition of good brick earth, Harmful ingredients in brick earth, qualities of good bricks, tests for bricks, classification of bricks. [4]

Timber: Definition, classification of trees, structure of a tree, felling of trees, seasoning of timber, storage of timber, market forms of timber. [4]

Part-B

Lime: General, some definitions calcination, Hydraulicity, setting, slacking, sources of lime, classification of limes, uses of lime, tests for limestones. [4]

Cement: Constituents of Cement**,** Manufacture of Portland cement [2]

Concrete : Introduction, Constituents of concrete, Batching of materials, Manufacturing process of cement concrete, workability and factors affecting it, Methods to determine workability, segregation and bleeding of concrete, Strength of concrete and factors affecting it. [4]

Miscellaneous materials: Paints, Distempering, Glass, Plastics [2]

Part-C

Foundation and Walls: Definition, types of foundations, Types of walls and thickness considerations. [4]

Brick and stone masonry: Terms used, Types of bonds & their merits and demerits, rubble and ashlars joints in stone masonry, cement concrete hollow blocks and their advantages and disadvantage. [4]

Damp Proofing: Sources, causes and bad effects of dampness, preventive measures for dampness in buildings. [2]

Part-D

Roofs: Terms used, Classification of roofs and roof trusses, Different roof covering material [2]

Plastering and pointing: Objects, Methods of plastering, Materials and types, Defects in plastering, special material for plastered surface, Distempering white washing and colour washing**.** [4]

Floors: General, Types of floors used in building & and their suitability, factors for selecting suitable floor for building**.** [2]

REFERENCE:
1. Rangwala S.C. "EngineeringMaterials" Charotar Publishing House Anand India, 1989.
2. Bindra SP, Arora KR "Building construction" DhanpatRai Publications, Delhi 1970.
3. ShettyMS , "Concrete Technology" S. Chand & Co. N. Delhi, 2005
4. Punmia BC, "Building construction" Laxmi Publications Pvt. Ltd. 2008.
5. KumarSushil , "Building Construction" Standard Publishers Distributors, 2006

DAV UNIVERSITY, JALANDHAR

Course Title: STRENGTH OF MATERIALS

L	T	P	Credits
4	1	0	4

Paper Code: CIV209

Course Objective: This course will provide the knowledge of various types' supports, loadings, beams and stresses acting on different kind of structural systems.

Learning Outcomes: After the completion of this course the participants would gain the knowledge various stresses and strains acting on materials, Types of Beams and types of loadings Bending stresses on various types of Beams

Part-A

Simple stresses and strains: Concept of stress and strain: St. Venants principle of stress and strain diagram, Hooke's law, Young's modulus, Poisson ratio, stress at a point, stresses and strains in bars subjected to axial loading, Modulus of elasticity, stress produced in compound bars subject to axial loading, Temperature stress and strain calculations due to applications of axial loads and variation of temperature in single and compound walls. [6]

Compound stresses and strains: Two dimensional system, stress at a point on a plane, principal stresses and principal planes, Mohr's circle of stress, Relationship between elastic constants and strains, ellipse of stress and their applications, Two dimensional stress-strain system, principal strains and principal axis of strain, circle of strain and ellipse of strain. [6]

Part-B

Bending moment and shear force diagrams: Bending moment and shear force diagrams, Shear Force and Bending Moments definitions. BM and SF diagrams for cantilevers, simply supported and fixed beams with or without overhangs and calculation of maximum BM and SF and the point of contra flexure under: Concentrated loads, uniformly distributed loads over the whole span or part of span, combination of concentrated loads (two or three) and uniformly distributed loads, uniformly varying loads, application of moments. [6]

Theory of bending stresses: Assumptions in the simple bending theory, derivation of formula: its application to beams of rectangular, circular and channel sections, composite/fletched beams, bending and shear stresses in composite beams. [6]

Part-C

Torsion: Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts torsional rigidity, combined torsion and bending of circular shafts principal stress and maximum shear stresses under combined loading of bending and torsion, analysis of close-coiled-helical springs. [6]

Thin cylinders and spheres: Derivation of formulae and calculations of hoop stress longitudinal stress in a cylinder, and sphere subjected to internal pressures increase in Diameter and volume. [4]

Part-D

Columns and struts: Columns under uni-axial load, Buckling of Columns, Slenderness ratio and conditions. Derivations of Euler's formula for elastic buckling load, equivalent length, Rankine Gordon's empirical formula. [4]

Strain energy: Energy of dilation and distortion, resilience stress due to suddenly applied loads, Castigliano's theorem, and Maxwell's theorem of reciprocal deflection. [4]

Theories of Failure: Maximum principal stress theory, maximum shear stress, theory, maximum strain energy theory, maximum shear strain energy theory, graphical representation and derivation of equation for each and their application to problems relating to two dimensional stress systems only. [2]

DAV UNIVERSITY, JALANDHAR

REFERENCES:

1. RamamruthamS."Strength of Material" DhanpatRai, 1992
2. Popov E. "Mechanics of Materials" ,Pearson Education, Limited, 1991.
3. Rajput R. K. "Strength of Material" S. Chand Publishers, 2006.
4. Singh Sadhu &Sandhu "Strength of Materials" Khanna Publishers, 1999.
5. Debabrata Nag and ChandaAbhijit"Fundamentals of Strength of materials", Wiley India publisher, 2010.

DAV UNIVERSITY, JALANDHAR

Course Title: Surveying Lab
Paper Code: CIV211

L	T	P	Credits
0	0	3	2

List of experiments:
1. Measurement of distance, ranging a line.
2. Measurement of bearing and angles with compass, adjustment of traverse by graphical method.
3. Different methods of leveling, height of instrument.
4. Different methods of leveling, rise & fall methods.
5. Measurement of horizontal and vertical angle by theodolite.
6. Determination of tachometric constants and determination of reduced levels by tachometric observations.
7. Plane table survey, different methods of plotting.
8. Two point & three point problem.
9. Determination of height of an inaccessible object.
10. Setting out a transition curve. Setting out of circular curves in the field using different methods.

DAV UNIVERSITY, JALANDHAR

Course Title: Hydraulic Engineering Lab

Paper Code: CIV213

L	T	P	Credits
0	0	2	1

List of experiments:

1. To determine the meta-centric height of a floating vessel under loaded and unloaded conditions.
2. To study the flow through a variable area duct and verify Bernoulii's energy equation.
3. To determine the coefficient of discharge for an obstruction flow meter (venturimeter)
4. To determine the coefficient of discharge for an obstruction flow meter (orifice meter)
5. To determine the discharge coefficient for a Vee notch or rectangular notch.
6. To determine the coefficient of discharge for Broad crested weir**.**
7. To determine the hydraulic coefficients for flow through an orifice.
8. To determine the friction coefficient for pipes of different diameter.
9. To determine the head loss in a pipe line due to sudden expansion / sudden contraction/ bend.
10. To determine the velocity distribution for pipe line flow with a pitot static probe.

REFERENCE:

1. Bloomer John J. "Practical Fluid Mechanics for Engineering Applications (Mechanical Engineering)Marcel Dekker Inc. New York, 1999.
2. Singh Sarabjit "Fluid Mechanics Practical Manual"PHI Learning Pvt. Ltd.New Delhi, 2009.

DAV UNIVERSITY, JALANDHAR

Course Title: Strength of Materials Lab
Paper Code: CIV215

L	T	P	Credits
0	0	2	1

List of experiments:

1. Draw Stress Strain curve for Ductile and Brittle material in tension.
2. Draw Stress Strain curve for Ductile and Brittle material in compression.
3. Draw shear stress, shear strain curve for ductile and brittle material in torsion strength testing
4. Draw load deflection curve for spring in loading conditions.
5. Draw load deflection curve for spring in unloading conditions.
6. To determine the hardness of the given material by Rockwell and Brinell hardness testing machine.
7. To determine the fatigue strength of the material.
8. To determine the impact strength by Izod and Charpy test.
9. To determine the load carrying capacity of the leaf spring.
10. To test a mild steel and cast iron specimen in double shear.

DAV UNIVERSITY, JALANDHAR

FOURTH SEMESTER

Course Title: GEOMATIC ENGINEERING
Paper Code: CIV202

L	T	P	Credits
3	0	0	3

Course Objective: Aim of this paper is to familiarize the students with different types of modern techniques in remote sensing.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various modern remote sensing techniques, Various GIS & GPS systems.

Part-A

Photogrammetry: Introduction of Geometric Engineering, Basic Principles, Photo-Theodolite, Elevation of a Point by Photographic Measurement, Aerial Camera, Vertical Photograph, Tilted Photograph, Scale, Crab and Drift, Flight Planning for Aerial Photography, Ground Control for Photogrammetry, Photomaps and Mosaics, Stereoscopic Vision, Stereoscopic parallax, Stereoscopic Plotting Instruments, Applications. [8]

Electromagnetic Distance Measurement (EDM): Electromagnetic Waves, Carrier Waves, Black body radiation, Laws of radiation Modulation, Types of EDM Instruments, Electro-optical, Infrared, and Microwave EDM Instruments, Effect of Atmospheric Conditions, The Geodimeter, The Tellurometer, Wild Distomats, Electronic Total Station. [8]

Part-B

Remote Sensing: Introduction, Basic Principles, Electromagnetic (EM) Energy Spectrum, EM Radiations and the Atmosphere, Interaction of EM radiations with Earth's Surface, Types of remote sensing systems, Remote Sensing Observation Platforms, Satellites and their characteristics – Geo-stationary and sun-synchronous, Earth Resources Satellites, Meteorological satellites, Sensors, Types and their characteristics, Across track and Along track scanning, Applications of Remote Sensing. [10]

Part-C

Geographical Information System (GIS): Definition, GIS Objectives, Hardware and software requirements for GIS, Components of GIS, Coordinate System and Projections in GIS, Data structure and formats, Spatial data models – Raster and Vector, Data inputting in GIS, Data base design - editing and topology creation in GIS, Linkage between spatial and non-spatial data, Spatial data analysis – significance and type, Attribute Query, Spatial Query, Vector based spatial data analysis, Raster based spatial data analysis, Errors in GIS, Integration of RS and GIS data, Digital Elevation Model, Network Analysis in GIS, GIS Software Packages. [10]

Part-D

Global Positioning System (GPS): Introduction, Fundamental concepts, GPS system elements and signals, GPS measurements and accuracy of GPS, Satellite Movement, GPS Satellites, Co-ordinate systems - Geoids, Ellipsoid and Datum, Spheroid, Customised Local Reference Ellipsoids, National Reference Systems, Worldwide Reference Ellipsoid, WGS 84, Differential-GPS, Classification of GPS receivers, GPS Applications. [10]

REFERENCE:

1. Arora, K.R.,: "Surveying Vol.-III", Standard Book House, 2007.
2. Campbell, J.B.: "Introduction to Remote Sensing", Taylor Publications, 2002.
3. Chang.T.K.: "Geographic Information Systems", Tata McGrawHill,2002
4. Heywood.I, Cornelius S, CrverSteve. : "An Introduction to Geographical Information Systems", Pearson Education, 2003.
5. Joseph George, : "Fundamentals of Remote Sensin", Universities Press, 2003.
6. Punmia, B.C., Jain A.K., : "Higher Surveying", Luxmi Publications, 2005.
7. Sabbins, F.F., : "Remote Sensing Principles and Interpretation", W.H.Freeman and company, 1985
8. Kaplan, E.D., Understanding GPS : "Principles and Application"; Artec House; 2nd Edition 2005.

DAV UNIVERSITY, JALANDHAR

Course Title: THEORY OF STRUCTURE-1

Paper Code: CIV204

L	T	P	Credits
4	1	0	4

Course Objective: Aim of this paper is to familiarize the students with different types of structures and their analysis methods.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of structural analysis and various types of determinate and indeterminate beams.

Part-A

Introduction: Need of analysis, techniques of structural idealization, basic tools of analysis, reactions in structure, notations and sign conventions, free – body diagrams, static determinacy, stability of structures, principle of superposition, loads on structures. [6]

Plane Trusses: Introduction, member arrangement in a truss, stability and determinacy, roof and bridge trusses, analysis of trusses, notations and sign conventions, equations of condition, classification of trusses. [6]

Part-B

Deflection of Beams: Introduction, direct integration method, moment – area method, conjugate beam method, Principle of virtual work, unit load method, Betti's law, Maxwell's law, Castigliano's theorem. [6]

Rolling Loads Introduction to rolling loads and influence lines, Determination of shear force, bending moment at a section and absolute shear force and bending moment due to single point load, uniformly distributed load, several point loads etc. [6]

Part-C

Influence lines: Introduction, moving loads, influence lines, influence lines for reactions, shear force and bending moment, influence lines for beams, girders with floor beams, trusses and arches, absolute maximum B. M. & S. F, Muller Breslau Principle [6]

Arches: Introduction, curved beams, arch versus a beam, three hinged arch, moment, shears and normal thrust in three hinged arches [6]

Part-D

Cables and Suspension Bridges: Introduction, shape of a loaded cable, cable carrying point loads and UDL, cables with ends at different level, cable subjected to temperature stresses, suspension bridge with two hinged and three hinged stiffening girders, influence lines. [6]

Statically determinate space Trusses: Concurrent forces in space, moment of force, constraint of point in space, tension coefficient method, simple space trusses, and method of sections [6]

REFERENCES:

1 Reddy C. S. ;"Basic structural Analysis",Tata McGraw-Hill Education, 2003.

2Vazirani&Ratwani;"Analysis of Structures Vol- I and Vol.-II", Khanna Publishers, 1999.

3 Wang C. K. ;"Intermediate structural Analysis", McGraw-Hill, 1983.

4 Jain A. K. ;"Advanced Structural Analysis",Nem Chand & Bros., Roorkee, 1990.

5 Gupta S. P. &Pandit G. S.; "Theory of Structures, Vol. I", Tata McGraw Hill, New Delhi, 2008.

6 MenonDevdas; "Advanced Structural Analysis", Alpha Science International Publisher, 2009.

DAV UNIVERSITY, JALANDHAR

Course Title: DESIGN OF CONCRETE STRUCTURE-1

L	T	P	Credits
4	1	0	4

Paper Code: CIV206

Course Objective: Aim of this paper is to familiarize the students with Concrete technology and design of various concrete elements like beams, columns etc.

Learning Outcomes: After the completion of this course the participants would gain the knowledge for design of various concrete elements like beams and columns

Note: Use of IS-456 is allowed in the examination.

Part-A

Introduction: Concrete as a Structural material, constituent materials of concrete. Cement, testing of cement: Fineness, consistency, setting times, strength, Mechanical properties: Bond, strength, toughness, hardness, physical Properties. Soundness of aggregate – Thermal properties – Sieve analysis – Fineness modulus – Grading curves. Physical Properties of Fresh Concrete: Workability: factors affecting, methods of determination of workability, Density of fresh concrete.   [8]

Mix Design: Factors to be considered: water/cement ratio, durability, workability, cement and aggregate content, Design of mix by IS & ACI methods.   [4]

Part-B

Limit State Design Method (IS:456): Introduction to Working Stress Method and Limit State Method, Characteristic values, characteristic strength, characteristic loads, design values for materials and loads, factored loads, Determination of Neutral Axis Depth and Computation of Moment of Resistance   [6]

Limit State of Collapse (Flexure) Types of failures, assumptions for analysis and design of singly reinforced, doubly reinforced sections, and flanged sections.   [4]

Part-C

Limit State of Collapse (Shear, bond and torsion) Introduction Design for shear, structural components subjected to torsion, design of rectangular beam section for torsion, development length.   [4]

Limit State of Serviceability Deflection, effective span to effective depth ratio, modification factors for singly reinforced, doubly reinforcement and flanged beams, crack formation and its control.   [2]

Design of Singly and Doubly Reinforced Rectangular Beams   [6]

Part-D

Design of Flanged Beams, Reinforced Concrete Slabs: One way and Two way Slabs.
Stairs – Types and design.   [14]

REFERENCES:

1. Shetty M. S.;"Concrete Technology", S. Chand & Co. 2005.
2. Gambhir M. L.;"Concrete Technology", Tata Mc. Graw Hill Publishers, New Delhi
3. Krishna RajuN.; "Advanced Design of Structures", New Age International Publishers, 2003.
4. Ramachandra; "Limit State Design", scientific publishers, 2007.
5. Jain A.K.; "Limit State Design", Laxmi Publications, 2007.
6. Vergese P.C.; "Limit State Design of Reinforced Concrete" PHI Learning publishers, 2008.
8. Pillai & Menon"Reinforced concrete design", Tata Mcgraw hills, 2009.

DAV UNIVERSITY, JALANDHAR

Course Title: Hydraulics Engineering-2

L	T	P	Credits
4	1	0	4

Paper Code: CIV208

Course Objective: Aim of this paper is to familiarize the students with different types of flows, channels and their properties in fluid flow.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of types of flows and the various channels through which water flows.

Part-A

Laminar Flow: Navier-stokes equations in Cartesian coordinates (no derivation), meaning of terms, Flow through circular section pipe, flow between parallel plates, stokes law. Flow through porous media. Transition from laminar to turbulent, Critical velocity and critical Reynolds Number

[6]

Turbulent Flow: Turbulent flows and flow losses in pipes, Darcy equation minor head losses in pipe fittings, hydraulic and energy gradient lines. Definition of turbulence, scale and intensity, Effects of turbulent flow in pipes. Equation for velocity distribution in smooth and rough pipes (no derivation).Resistance diagram. [6]

Part-B

Boundary Layer Analysis: Assumption and concept of boundary layer theory. Boundary-layer thickness, displacement, momentum & energy thickness, laminar and turbulent boundary layers on a flat plate; laminar sub-layer, smooth and rough boundaries. Local and average friction coefficients. Separation and Control. [8]

Part-C

Uniform flow in open Channels: Flow classifications, basic resistance Equation for open channel flow. Chezy, Manning, Bazin and Kutter formulae.Variation of roughness coefficient, conveyance and normal depth.Velocity Distribution. Most efficient flow sections; rectangular, trapezoidal and circular [4]

Energy and Momentum principles and critical flow: Energy and specific Energy in an open channel; critical depth for rectangular and trapezoidal channels. Alternate depths, applications of specific energy to transitions and Broads crested weirs. Momentum and specific force in open channel flow, sequent depths. [6]

Part-D

Gradually varied Flow: Different Equation of water surface profile; limitation, properties and classification of water and surface profiles with examples, computation of water surface profile by graphical, numerical and analytical approaches. [6]

Hydraulic Jump and Surges: Theory of Jump, Elements of jump in a rectangular Channel, length and height of jump, location of jump, Energy dissipation and other uses, Positive and negative surges

[6]

REFERENCES:
1. Modi P.N. & Seth S.M., "Hydraulic and Fluid Mechanic". Standard Book House, New Delhi, 1991.
2. SubraminayamS. ;"Flow in Open Channels", Tata MacGraw Hill, 2000.
3. Robert N.Fox& Alan T.Macnold ;"Introduction to Fluid Mechanics", McGraw Hill, 2003
4. Bansal R. K. "Fluid Mechanics", Laxmi Publications 2007.
5. JagdishLal"Fluid Mechanics", Metropolitan Book Co. (p) Ltd. 2002.

DAV UNIVERSITY, JALANDHAR

	L	T	P	Credits
Course Title: ENGINEERING GEOLOGY	3	0	0	3

Paper Code: CIV210

Course Objective: Aim of this paper is to familiarize the students with different type's rocks and the origin of these rocks.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various types of geological rocks their origin and uses in civil engineering.

Part-A

General Geology: Divisions of geology, Importance of Engineering Geology versus geology applied to Civil Engineering practices. Weathering, definition types and effect. Geological works of rivers, wind, glaciers as agents of erosion, transportation and deposition, resulting features and engineering importance. [4]

Rocks and Minerals: Minerals, their identification and physical properties of minerals, igneous, sedimentary and metamorphic rocks, their formation and structures. Classification of rocks for engineering purpose. Rock quality designation (RQD). [4]

Structural Geology: Brief idea about stratification, apparent dip, true dip, strike andun-conformities. [2]

Part-B

Folds: Definition, parts of a fold, classification, causes relation to engineering operations. [2]

Faults: Definition, parts of a fault, classification cause relation to engineering purposes. [2]

Joints: Definition, attitude, joint set, joint systems, classification in relation to engineering operations. [2]

Engineering Geology: Geological considerations in the Engineering Projects like tunnels highways, foundations, dams, and reservoirs. [2]

Earthquake. Definition, terminology, earthquake waves, intensity, recording of earthquake, seismic zones in India, factors to be considered and methods in earthquake proof construction. [4]

Part-C

Earth movements: Landslides and land subsidence, elementary idea about classifications, factors causing landslides and land subsidence, preventive measures like relating walls, slope treatment, chemical stabilization and drainage control. [6]

Engineering Properties of Rocks and Laboratory Measurement: Uniaxial compression tests, tensile tests, permeability test, shear tests, effect of size and shape of specimen and rate of testing. Confining pressure, stress strain curves of typical rocks. Strength of intact and fissured rocks, effect of anisotropy, influence of effect of pore fluid type instauration and temperature [6]

Part-D

In-situ determination of Engineering Properties of Rock Masses: Necessity of in-situ test,uniaxial load tests in tunnels and open excavation, cable tests, flat jack test, shear test, pressure tunnel test. Simple methods of determining in-situ stresses bore hole over coring technique-bore hole deformation gauges. [6]

Improvement in Properties of Rock Masses: Pressure grouting for dams and tunnels, rock reinforcement, rock bolting. [6]

REFERENCES:

1. Goodman R E "Introduction to Rock Mechanics", John Wiley & Sons, New York, 1989
2. Jaguer J C and Cook N G W "Foundational of Rock Mechanics" 3rd ed., Chapman & Hall London, 1979
3. Lama R D and Vutukuri V S with Saluja S S "Handbook on Mechanical Properties of Rocks" Vols. I to IV, Trans Tech Publications, Rockport, MA 1999.
4. Arora D S "A Text Book of Geology", Mahindra Capital Publishers, Chandigarh, 1988
5. Singh P "Engineering and General Geology" S. K. Kataria and Sons, New Delhi, 1992
6. BP Verma "Rock Mechanics for Engineers", Khanna Publishers, 2007.

DAV UNIVERSITY, JALANDHAR

Course Title: CONSTRUCTION MACHINERY AND WORKS MANAGEMENT	L	T	P	Credits
	3	0	0	3

Paper Code: CIV212

Course Objective: Aim of this paper is to familiarize the students with different types of machinery elements used in projects and techniques to handle civil engineering projects.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various types of construction machinery and various methods like PERT and CPM to handle a project.

Part-A

Construction- Unique features of construction, construction project, types and features, phases of a project, agencies involved and their methods of execution. Planning and organizing construction site and resources- Site: site layout, developing site organization, record keeping at site, Manpower: planning, organizing, staffing, motivation, Materials: procurement and inventory control.   [4]

Construction project planning- Stages of project planning: pre-tender planning, Pre- construction planning, detailed construction planning, role of client and contractor. Process of development of plans and schedules, estimating durations, sequence of activities, activity utility data, project feasibility analysis.   [6]

Part-B

Techniques of planning- Bar charts, Networks: basic terminology, types of precedence relationships, preparation of CPM networks, activity on link and activity on node representation, analysis of single relationship (finish to start) networks, computation of float values, critical and semi critical paths, calendaring networks, network rules.   [6]

Part-C

PERT- Assumptions underlying PERT analysis, determining three time estimates, analysis, slack computations, calculation of probability of completion, line of balance technique, resource constraints and conflicts, resource aggregation, allocation, smoothening and levelling, work break-down structure, activity lists, assessment of work content,   [6]
Cost Model - Classification of costs, optimum duration, cost optimization   [4]

Introduction to Construction Management Software: MS Projects, PRIMAVERA   [2]

Part-D

Equipment: Importance, need, functions and principles, types of equipment and their uses, selection planning and matching of construction plant and equipment.   [2]

Earth Moving Machinery : Tractors, bull dozers, rippers, scrappers power shovels, dragline, hoes. Line diagram of each, sizes, output, uses, factors affecting selection of each equipment.
Hoisting & Transporting Equipment's: Hosts, Winches, Cranes, Belt conveyors, Ropeways, trucks & Wagons.
Construction Equipment : Plants for grading, batching, mixing, types of mixers, concrete pumps, bitumen plants   [8]

REFERENCE:

1. Barrie D.S. & Paulson B C, "Professional Construction Management", McGraw Hill
2. Chitkara K K, "Construction Project Management", Tata McGraw Hill
3. P K Joy, "Handbook of Construction Management".
4. King & Hudson, "Construction Hazard and Safety Handbook", Butterworth's
5. Antill J M &Woodhead R W, "Critical Path Methods in Construction Practice", Wiley
6. R.L. Peurifoy, W.B. Ledbetter and C.J. Schexnayder, "Construction planning and methods", Fifth editions, McGraw Hill International edition, (1996).
7. Punima B. C. and Khandelwal; Project Planning and Control with PERT and CPM, Laxmi Publication New Delhi.(2002)

DAV UNIVERSITY, JALANDHAR

Course Title: DESIGN OF CONCRETE STRUCTURE-1 LAB

L	T	P	Credits
0	0	2	1

Paper Code: CIV214

List of experiments:
1. To Determine the Specific Gravity of cement
2. To Determine the Soundness of cement.
3. To Determine the Standard Consistency, Initial and Final Setting Times of Cement and Compressive Strength of Cement.
4. To Determine the Fineness Modulus, Bulk Density.
5. To determine water Absorption and Specific gravity of Fine and Coarse Aggregates.
6. To Determine the Slump, Compaction Factor and Vee-Bee Time of Concrete.
7. Mix Design of Concrete by IS methods
8. To Determine the Compressive Strength of Concrete by Cube and Cylinder.
9. To carry out the Split Tensile and Flexural strength of Concrete.
10. Compressive strength of Brick and Tile as IS standard

Books/Manuals :-
1. Gambhir M. L.; "Concrete Manual" ,DhanpatRai& Sons Delhi 1997.
2. Concrete Lab Manual by TTTI Chandigarh, 2006.
3. Shetty M.S.; "Concrete Technology, Theory and Practice S.Chand& Company 2004.

DAV UNIVERSITY, JALANDHAR

Course Title: THEORY OF STRUCTURE-1 LAB

Paper Code: CIV216

L	T	P	Credits
0	0	2	1

List of Experiments:
1. Deflection of a simply supported beam and verification of Clark-Maxwell's theorem.
2. To determine the Flexural Rigidity of a given beam.
3. To verify the Moment- area theorem for slope and deflection of a given beam.
4. Deflection of a fixed beam and influence line for reactions.
5. Deflection studies for a continuous beam and influence line for reactions.
6. Study of behavior of columns and struts with different end conditions.
7. Experiment on three-hinged arch and experiment on two-hinged arch.
8. Deflection of a statically determinate pin jointed truss.
9. Forces in members of redundant frames.
10. Experiment on curved beams and unsymmetrical bending of a cantilever beam.

REFERENCE:

Singh Harwinder; "A Laboratory Manual on Structural Mechanics" , New Academic Publishing Comp. Ltd. 2011.

DAV UNIVERSITY, JALANDHAR

FIFTH SEMESTER

Course Title: DESIGN OF STEEL STRUCTURE-1

L	T	P	Credits
4	1	0	4

Paper Code: CIV301

Course Objective: Aim of this paper is to familiarize the students with design of different steel structural elements like compression members and tension members.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various types of steel elements like Tension member, compression member and flexural member.

Note: Use of IS-800 is allowed in the examination.

Part-A

Riveted, Bolted & Welded Joints: Rivets and riveting, stresses in rivets, strength & failure of riveted joints. Advantages and disadvantages of bolted connections, stresses in bolts and design of bolted connections. Types of welds & welded joints, stresses in welds, design of welds, eccentrically loaded welded joints [8]

Tension Members: Types of tension members, net & gross areas, permissible stresses. Design of members subjected to axial loads, combined bending moments & axial loads, lug angles. Tension Splice [6]

Part -B

Compression Members: Failure modes of columns, end conditions & effective length of columns, various empirical formulae. IS code formula, General codal provisions for design of compression members? Built up compression members, lacing and battening of compression members, splicing of compression members. [8]

Part-C

Column Bases and Foundations: Types of column bases, design of slab base, Gusseted base& grillage foundations. [8]

Design of Flexural Members: Failure modes permissible stresses, design of laterally supported and unsupported beams web crippling, web budding etc., compound beams. [8]

Part-D

Design of plate Girders: Components of a plate girder, basic design assumptions, stiffeners inplate girders, design of various components of a welded and riveted plate girder. [8]

Roof Trusses: Types of roof trusses loads on roof trusses, calculation of forces due to combination of different loads. Design of members and joints. [6]

REFERENCES:
1. Chandra R "Design of Steel Structures" Standard Publishing House, 1999.
2. Limit state design of steel structures: S K Duggal, McGraw, 2009.
3. Raghupathi M "Design of Steel Structures" Tata McGraw-Hill, New Delhi,1998.
4. Arya A S and Ajmani J L "Design of Steel Structures" Nem Chand Bros. Roorkee,2000.
5. Kazimi S M A and Jindal R S "Design of Steel Structures" Prentice Hall of India, New Delhi,1999.
6. Dayaratnam P "Design of Steel Structures" Wheeler Publishers, New Delhi,1999.
7. L.S Negi, "Design of steel structure", Tata McGraw-Hill, New Delhi, 2008.

DAV UNIVERSITY, JALANDHAR

Course Title: THEORY OF STRUCTURE-2

L	T	P	Credits
4	1	0	4

Paper Code: CIV303

Course Objective: Aim of this paper is to familiarize the students with different methods used in analysis of indeterminate structures.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various types of methods used to analyse indeterminate structures.

Part-A
Statically Indeterminate Beams and Frames: Introduction, types of supports-reaction components, external redundancy, statically indeterminate beams and frames, degree of redundancy   [6]

Fixed and Continuous Beams: Bending moment diagrams for fixed beams with different loadings,effect of sinking of supports, degree of fixity at supports, advantages and disadvantages of fixed beams, continuous beams, various cases of load and geometry of continuous beams.   [4]

Part-B
Classical Methods: Methods of consistent deformation; Theorem of three moments.   [4]

Slope Deflection Method: Fundamental equations, Applications to continuous beams and portal frames, side sway in portal frames.   [4]

Moment Distribution Method: Basic propositions, stiffness of a member, distribution theorem, carry-over theorem, relative stiffness, distribution factors, applications to continuous beams, portal frames with and without side sway, analysis of multi-storeyed frames, method of substitute frame.
          [4]

Part-C
Rotation Contribution method: Basic concepts, rotation factor, and application to continuous beams, portal frames and multi-storeyed frames, story shear.   [4]

Approximate methods of Structural Analysis: Portal method, Cantilever Method, substitute Frame Method.   [4]

Strain Energy: General principles, strain energy due to axial loading and bending, law of reciprocal deflections, Castigliano's first theorem, beam deflections using Castigliano's first theorem, minimum strain energy, Castigliano's second theorem, analysis of statically indeterminate beams and portal frames.   [4]

Part-D
Redundant Frames: Order of redundancy, frames with one and two redundant members. Stresses due to lack of fit, the trussed beam, portal frames.   [6]

Influence lines for indeterminate Structures: Muller Breslau Principle, Influence lines for shear force, bending moment and reactions in continuous beams, balanced cantilevers and rigid Frames.
          [4]

REFERENCE:
1. Reddy C S "Basic Structural Analysis" Tata McGraw Hill, New Delhi, 2003.
2. Wang C K "Intermediate Structural Analysis" McGraw Hill, 1998.
3.Punmia B C "Theory of Structures" Luxmi Publications, New Delhi, 1996.
4. Sinha N C "Advanced Theory of Structures" DhanpatRai Publications, New Delhi, 2000.
5.Ramamrutham S and Narayan R "Theory of Structures:" DhanpatRai& Sons, New Delhi, 1996.
6. "Advanced Structural Analysis",DevdasMenon, Alpha Science International Publisher.

DAV UNIVERSITY, JALANDHAR

Course Title: GEO-TECHNICAL ENGINEERING

Paper Code: CIV305

L	T	P	Credits
3	1	0	3

Course Objective: Aim of this paper is to familiarize the students with concept of soil and its index properties.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various types of foundations used in different civil engineering projects and various methods of soil testing.

Part-A

Basic Concepts: Definition of soil and soil mechanics common soil problem in Civil Engineering field. Principal types of soils. Important properties of very fine soil i. e. adsorbed water, Base Exchange and soil structure. Characteristics of main clay mineral groups. Basic definitions in soil mechanics. Weight volume relationship physical properties of soils. [8]

Index Properties: Determination of Index properties, classification of coarse grained soils and fine grained soils. [4]

Part-B

Permeability and seepage: Concept of effective stress principle. Seepage pressure, critical hydraulic gradient and quick sand condition. Capillary phenomenon in soil. Darcy's law and its validity seepage velocity. Co-efficient of permeability and its determination average permeability of striated soil mass Factors affecting 'K' and brief discussion. [6]

Compaction: Definition and object of compaction and concept of O.M.C. and zero Air Void Line. Modified proctor test. Factors affecting compaction. Effect of compaction on soil properties and their discussion. Field compaction methods their comparison of performance and relative suitability. Field comp active effort. Field control of compaction by proctor needle. [8]

Part-C

Consolidation: Definition and object of consolidation difference between compaction and consolidation. Concept of various consolidation characteristics i.e. a_v, m_v and C_v primary and secondary consolidation. Terzaghi's method for one-dimensional consolidation. Consolidation test. Determination of C_v from curve fitting methods. Normally consolidated and over consolidated clays importance of consolidation settlement in the design of structures. [10]

Part-D

Shear Strength: Stress analysis of a two - dimensional stress system by Mohr circle. Concept of pole. Coulomb's law of shear strength Coulomb - Mohr strength theory. Relations between principle stresses at failure Shear strength tests. Derivation of skempton's pore pressure parameters. Stress strain and volume change characteristics of sands. [6]

Stability of Slopes: slope failure, base failure and toe failure - Swedish circle method - $\varphi=0$ Analysis and c=0 analysis - friction circle method - Taylor's stability number - stability charts - sliding block analysis [6]

DAV UNIVERSITY, JALANDHAR

REFERENCE:

1. AroraK.R. ;"Soil Mech. & Foundation Engg", Standard *Publishers* Distributors, 2003.
2. Purshotam Raj P. ;"Geotechnical Engineering", *Tata Mcgraw Hill, 2006.*
3. Murthy V.N.S. ;"Soil Mech. & Foundation Engg"., CBS *Publishers*& Distributors, 2001.
4. Das B.M. ;"Principle of Geotechnical Engineering", Cengage Publisher, 2006.
5. RanjanGopal&RaoA.S.R. ;"Basic and applied Soil Mechanics", New Age International Publishers, 2008.

DAV UNIVERSITY, JALANDHAR

Course Title: TRANSPORTATION ENGINEERING

Paper Code: CIV307

L	T	P	Credits
3	1	0	3

Course Objective: Aim of this paper is to familiarize the students with highway planning and its maintenance.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of highway geometric design and various materials used in highway construction.

Part-A

Introduction: Importance and role of transportation systems; different modes of transportation, historical development of road construction, Highway Economics.   [4]

Highway Planning & Project Preparation: Planning surveys, Highway alignment, Highway Location surveys, soil and material surveys, Highway Projects: drawing and report.

[4]

Part-B

Highway Geometric Design: cross-sectional elements, camber, sight distance-definition analysis of stopping sight and passing sight distances, passing zones. Design of horizontal alignment-super elevation. Extra widening on curves, transition curves. Design of vertical alignment, gradients, types of vertical curves & their design   [10]

Part-C

Highway materials and construction: Desirable properties of soil, Road aggregates, bitumen, cement & cement concrete as highway materials. Various types of roads & their construction-earth roads, gravel roads, W.B.M., bituminous roads and quality control during construction.   [6]

Highway Drainage and Maintenance: Importance of drainage and maintenance, Surface Drainage and Subsoil Drainage, Construction in Water-logged areas, Pavement Failures, Pavement Evaluation, Maintenance and Strengthening Measures, Introduction to soil stabilization.   [6]

Part-D

Pavement Design: Design of flexible and rigid Pavements.   [8]

Elementary Traffic Engineering-Traffic Engineering studies (speed, volume, O & D, parking and accident studies), traffic signs, traffic signals, road markings, road intersection, highway lighting.

[4]

REFERENCE:

1. Khanna S.K., and Justo, C.E.G. "Highway Engineering", Nem Chand and Brothers, Roorkee, 1998.

2. Kadiyali, L.R. "Principles and Practice of Highway Engineering", Khanna Publishers, New Delhi, 1997.

3. Flaherty, C.A.O. "Highway Engineering", Volume 2, Edward Arnold, London, 1986.

4. Sharma, S.K. "Principles, Practice& Design of Highway Engineering", S. Chand & Company Ltd., New Delhi, 1985.

5. Mannering, "Principles of Highway Engineering & Traffic Analysis", Wiley Publishers, New Delhi, 2007.

DAV UNIVERSITY, JALANDHAR

Course Title: IRRIGATION ENGINEERING-1

L	T	P	Credits
4	0	0	4

Paper Code: CIV309

Course Objective: This course offers a good understanding of irrigation methods used and maintenance of different irrigation channels.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various methods of irrigation and types of losses in various irrigation channels.

Part-A

INTRODUCTION: Importance of Irrigation Engineering, purposes of Irrigation, objectives of Irrigation, Benefits of Irrigation, Advantages of various techniques of irrigation-- Furrow Irrigation, Boarder strip Irrigation, Basin Irrigation, Sprinkler Irrigation , Drip Irrigation.

[6]

METHODS OF IRRIGATION: Advantages and disadvantages of irrigation, water requirements of crops, factors affecting water requirement, consumptive use of water, water depth or delta , Duty of water, Base Period, relation between delta, duty and base period, Soil crop relation-ship and soil fertility. [6]

Part-B

CANAL IRRIGATION:Classifications of canals, canal alignment, Inundation canals, Bandhara irrigation, advantages and disadvantages, Silt theories-Kennedy's theory, Lacey's theory, Drawbacks in Kennedy's &Lacey's theories, comparison of Lacey's and Kennedy's theories, Design of unlined canals based on Kennedy &Lacey's theories. [6]

LINED CANALS:Types of lining, selection of type of lining, Economics of lining, maintenance of lined canals, silt removal, strengthening of channel banks, measurement of discharge in channels, design of lined canals, methods of providing drainage behind lining. [6]

Part-C

LOSSES IN CANALS, WATER LOGGING AND DRAINAGE:Losses in canals-Evaporation and seepage, water logging, causes and ill effects of water logging anti water logging measures. Drainage of land, classification of drains - surface and subsurface drainsDesign considerations for surface drains, Advantages and maintenance of tile drains. [6]

INVESTIGATION AND PREPARATION OF IRRIGATION PROJECTS: Classification of project, Project preparation-investigations, Design of works and drawings, concept of multi - purpose projects, Major, Medium and miner projects, planning of an irrigation project, Economics & financing of irrigation works. Documentation of project report. [6]

Part-D

TUBE - WELL IRRIGATION: Types of tube wells - strainer type, cavity type andslotted type. Type of strainers, Aquifer, porosity, uniformity coefficient, specific yield & specific retention, coefficients of permeability,transmissibility and storage.Yield or discharge of a tube well, Assumptions, Theim's&Dupuit's formulae, Limitations of Theim's and Dupuit's formulae.Interference of tube wells with canal or adjoining tube-wells, causes of failure of tube wells, optimum capacity, Duty and delta of a tube well. Rehabilitation of tube well. [8]

RIVER TRAINING WORKS:Objectives, classification of river-training works, Designof Guide Banks. Groynes or spurs - Their design and classification ISI. Recommendations of Approach embankments and afflux embankments, pitched Islands, Natural cut-offs and Artificial cut-offs and design Considerations. [4]

REFERENCES:
1. Sharma S.K. ;"Principles & practice of Irrigation Engg". S. Chand, Limited. 2007.
2. PunmiaB.C. ;"Irrigation & Water Power Engg." Laxmi Publications (p) Ltd, 2006.
3. Singh Bharat, ;"Fundamentals of Irrigation Engg."; Nem Chand & Bros, 2004.
4. Sahasrabudhe S. R. ; "Irrigation Engg. & Hydraulic Structure",S. K. Kataria& Sons, 1999.
5. Varshney, Gupta &Gupta ;"Irrigation Engg. & Hydraulic Structure" Nem Chand and Brothers, 2001.
6. Garg S K ;"Irrigation Engg. & Hydraulic Structure", Khanna Publishers, 2003.

DAV UNIVERSITY, JALANDHAR

Course Title: ESTIMATION & COSTING

L	T	P	Credits
3	0	0	3

Paper Code: CIV311

Course Objective: This course should provide the students with good understanding of various types of quantity and quality analysis of civil engineering projects.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of calculation of materials required for different projects.

Part-A

Estimates: Types, complete set of estimate, working drawings, site plan, layout plan, index plan, plinth area administrative approval and Technical Sanction.   [4]

1. Estimate of buildings
2. Estimate of R. C. C. works
3. Estimate of sloped roof and steel structures
4. Estimate of water supply and sanitary works
5. Estimates of roads (a) Earthwork (b) Bridges and culverts c) Pavement
6. Estimate of Irrigation works.   [6]

Part-B

Analysis of Rates: For earthwork, concrete works, D. P. C., Brickwork, stone masonry, plastering, pointing, road work, carriage of materials.   [6]

Specifications- For different classes of building and Civil engineering works   [6]

Part-C

Contracts: Types of contracts, tender, tender notice, tender form, submission and opening of tender, earnest money, security money, measurement book, muster roll, piecework agreement and work order   [8]

Part-D

Accounts: Division of accounts, cash, receipts of money, cashbook, temporary advance, imprest and accounting procedure.   [4]

Arbitration: Arbitration, arbitrator, and arbitration act, powers of arbitrator, arbitration awards.
          [4]

REFERENCES:

1. Datta B. N. ;"Estimating and Costing", UBSPD, New Delhi, 2008.
2. BirdiG.S. ;"Estimating and Costing", DhanpatRai Publication New Delhi, 2007.
3. ChakravortyV.N. ;"Estimating and Costing", Calcutta publisher, 2010.
4. PatilB.S. ;"Civil Engg. Contracts & Estimates", Orient-Longman Ltd., New Delhi, 2001.

DAV UNIVERSITY, JALANDHAR

Course Title: GEO-TECHNICAL ENGINEERING LAB

L	T	P	Credits
0	0	2	1

Paper Code: CIV313

1. Determination of in-situ density by core cutter method and Sand replacement method.
2. Determination of Liquid Limit & Plastic Limit.
3. Determination of specific gravity of soil solids by pyconometer method.
4. Grain size analysis of sand and determination of uniformity coefficient (Cu) and coefficient of curvature (Cc).
5. Compaction test of soil and Determination of Relative Density of soil.
6. Determination of permeability by Constant Head Method.
7. Determination of permeability by Variable Head method.
8. Unconfined Compression Test for fine grained soil.
9. Direct Shear Test
10. Triaxial Test and Swell Pressure Test

Books Recommended:-

PrakashShamsher& Jain P.K. ; "Soil Testing Engineering Manual" Nem Chand & Brother, 1997.

DAV UNIVERSITY, JALANDHAR

Course Title: TRANSPORTATION ENGINEERING LAB

L	T	P	Credits
0	0	2	1

Paper Code: CIV315

List of Experiments
1. Aggregate crushing value test and Impact value test.
2. Abrasion test (Dorry's& Los Angeles)
3. Soundness test and Flakiness test.
4. Water absorption & specific gravity test
5. Laboratory C. B. R. test.
6. Penetration test on bitumen and Softening point test for bitumen
7. Ductility test.
8. Specific gravity Test.
9. Viscosity test.
10. Marshall Stability test.

DAV UNIVERSITY, JALANDHAR

Course Title: COMPUTER AIDED STEEL DRAWING

L	T	P	Credits
0	0	2	1

Paper Code: CIV317

List of Experiments
1) Detailed working drawings for Industrial buildings, Steel Foot Bridge & Trough Type Railway Bridge
2) Structural Drawings of Steel Elements such as Connections, Tension Members, Compression Members, Beams, Column Base, and Roof Trusses.
Using Auto Cad***

DAV UNIVERSITY, JALANDHAR

SURVEY CAMP

L	T	P	Credits
0	0	0	2

Code: CIV319

List of Experiments

Survey Camp of 4 weeks duration will be held immediately after IVth semester at a Hilly Terrain. The students are required to prepare the Topographical Map of the area by traditional method. Students should also be exposed to modern Survey Equipment and practices, like Total Station, Automatic Level, GPS etc.

DAV UNIVERSITY, JALANDHAR

SIXTH SEMESTER

Course Title: DESIGN OF CONCRETE STRUCTURE-2

Paper Code: CIV302

L	T	P	Credits
4	1	0	4

Course Objective: This course should provide the students with good understanding of various types of concrete members and their design

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various steps in design procedure of concrete structures like stairs and beams.

Note: Indian Codes (IS 456) of Practice and Design handbooks are permitted in examination.

Part-A
RCC Footings - Theory and Design: Isolated Footing (Square, Rectangular), Combined Footing (Rectangular, Trapezoidal, Strap), Raft Footing   [8]

Retaining walls: Cantilever type retaining wall, Counter fort type retaining wall.   [6]

Part-B
Compression Members: Definitions, Classifications, Guidelines and Assumptions, Design of Short Axially Loaded Compression Members, Design of Short Compression Members under Axial Load, Design of Slender Columns   [8]

Part-C
Beams curved in plan: Design of semi-circular beams supported on three supports. Design of circular beam supported on symmetrically placed columns.   [8]

Building Frames: Load patterns for critical conditions, design of continuous beams, slabs, columns, detailing of reinforcement in the same. (Use of SP16)   [6]

Part-D
Domes. Introduction to different types of domes and shells. Design of spherical and conical domes.
                                                                                                     [6]

Water Tanks: Introduction to water retaining structures. Design of circular and rectangular overhead water tanks.   [8]

REFERENCES:

1. Pillai&Menon ;"Reinforced Concrete Design";; Tata McGraw-Hill Education, 2006.
2. Varghese P C "Limit state Design of Reinforced Concrete" Prentice-Hall of India Pvt. Ltd. 2009.
3. Mallick and Rangasamy ;"Reinforced Cement Concrete" Oxford-IBH, 2010.
4. Syal I.C "Behaviour, Analysis and Design of Reinforced Concrete structural Elements" S. Chand & company, New Delhi, 2003.
5. James, G. Mac Gregor,"Reinforced Concrete- Mechanics and Design", Prentice Hall, N.J., New York, 1997

DAV UNIVERSITY, JALANDHAR

Course Title: FOUNDATION ENGINEERING

L	T	P	Credits
4	1	0	4

Paper Code: CIV304

Course Objective: This course should provide the students with soil investigation and different types of foundations used in civil projects.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design of different types of foundations used in civil engineering projects.

Part-A

Soil Investigation: Object of soil investigation for new and existing structures. Depth of exploration for different structures. Spacing of bore Holes. Methods of soil exploration and relative merits and demerits. Types of soil sample. Design features of sampler affecting sample disturbance. Essential features and application of the following types of samples-Open Drive samples, Stationery piston sampler, Rotary sampler, Geophysical exploration by seismic and resistivity methods. Bore Hole log for S.P.T. [8]

Part-B

Earth Pressure: Terms and symbols used for a retaining wall. Movement of wall and the lateral **e**arth pressure. Rankine's and Coulomb's theory for lateral earth pressure.Culmann's graphical construction and Rebhan's graphical construction. [6]

Stress Distribution: Boussinesq's equation for a point load, uniformly loaded circular andrectangular area, pressure distribution diagrams. New marks chart and its construction. Two- to one method of load distribution.Comparison of Bossinesq and Westerguard analysis for a point load.Limitations of elastic formula. [4]

Part-C

Shallow Foundation: Types of shallow foundations, definitions Terzaghis analysis. Type's of failures. Factors affecting bearing capacity. Skemptions equation. B. I. S. recommendations for shape, depth and inclination factors. Plate Load Test and Standard Penetration Test. Contact pressure distribution. Causes of settlement of structures comparison of immediate and consolidation settlement Calculation of settlement by plate load test and Static Cone Penetration Test data. Allowable settlement of various structures according to IS Code. Situation most suitable for provision of rafts. Proportioning of rafts in sand and clays. Various methods of designing raft. Floating foundation. [10]

Part-D

Pile Foundation: Necessity and uses of piles, classification of piles. Merits and demerits ofdifferent types based on composition. Types of pile driving hammers & their comparison.Effect of pile driving on adjacent ground.Use of Engineering news formula and Hiley's formula for determination of allowable load. Pile Load Test, separation of skin friction and point resistance using cyclic pile load test data. Related Numerical problems.Determination of point resistance and frictional resistance of a single pile by static formula. Piles in clay, safe load on a friction and point bearing pile. Pile in sand spacing of piles in a group, factors affecting capacity of a pile group. Efficiency of pile group bearing capacity of a pile group in clay. Settlement of pile groups in clay and sand Negative skin friction. [4]

Caissons and wells: Major area of use of caissons Advantages and disadvantages of open box and pneumatic caissons. Essential part of a pneumatic caisson. Components of a well. Calculation of allowable bearing pressure. Conditions for stability of a well.Terzaghi's analysis for Lateral stability of a well, embedded in sand. Forces acting on a well foundation. Computation of scour depth, Tilts & Shifts. [4]

Machine Foundations: Introduction of machine foundation, Types of machine foundation, IS method of design of machine. [4]

REFERENCES:

1. Arora K. R. ;"Soil Mech. & Foundation Engg", Standard Publishers Distributors, 2005

2. Purshotama P. "Geotechnical Engineering", Pearson education, 2008.

3. Murthy V N S ;"Soil Mech. & Foundation Engg" , Mercel Dekker, 2003.

4. Das B.M. ;"Principle of Foundation Engineering" , CL Engineering publications, 2002.

5. RanjanGopal&Rao A.S.R. ; "Basic and applied Soil Mechanics", New Age International Publishers, 2008.

6. Muni Budhu "Soil Mech. & Foundations", John Wiley & Sons, 2008.

7. Gulhati and Datta ;"Geotechnical Engineering", Tata McGraw - Hill Education, 2009.

8. Varghese P.C ;"Foundation Engineering", PHI Learning 2005

9. Verma B. P.; "Problems in Soil mechanics and Foundation Engineering", Khanna Publication, 2007.

10. Bowles J.E; "Foundation Analysis and Design", Tata McGraw - Hill Education, 2010.

DAV UNIVERSITY, JALANDHAR

Course Title: ENVIRONMENTAL ENGINEERING-2

L	T	P	Credits
4	0	0	4

Paper Code: CIV306

Course Objective: This course should provide the students with good understanding of various types of sewers and drainage types

Learning Outcomes: After the completion of this course the participants would gain the knowledge of characteristics and types of sewage treatment of sewage.

Part-A

Introduction: Terms & definitions, systems of sanitation and their merits and demerits, system of sewerage, choice of sewerage system and suitability to Indian conditions. Design & planning of a sewage system. [6]

Design of Sewers: Quantity of sanitary and storm sewage flow, forms of sewers, conditions of flow in sewers, sewers of equivalent section, self-cleansing and limiting velocity, hydraulic formulas for flow of sewage in sewers and their design. [6]

Part-B

Construction & Maintenance of Sewers: Sewer appurtenances, Materials for sewers, laying of sewers, joints in sewers, testing of sewers pipes, Maintenance operations and precaution before entering a sewer. Excavating Trenches. [6]

House Drainage: Principles of house drainage, traps, Inspection chamber Indian and European type W. C., Flushing Cisterns soil waste and anti-siphonage pipes, plumbing systems. [6]

Part-C

Characteristics & Testing of Sewage: Composition of sewage, sampling, physical & chemical analysis of sewerage, biological decomposition of sewage, kinetics of organic waste stabilization. Populating equivalent & relative stability. [6]

Treatment of Sewage: Unit processes of waste water treatment, screens, grit chambers, detritus tank, skimming tank, grease traps, sedimentation, chemical treatment, aerobic biological treatment, trickling filter (LRTF & HRTF), activated sludge processes, anaerobic treatment, sludge digestion [6]

Part-D

Low cost waste water treatment units: Oxidations Ponds, Lagoons, ditches, septic tanks and imhoff tanks, theory, design, advantages & disadvantages. [6]

Sewage Disposal: Dilution, self-purification of streams, oxygen deficiency of polluted streams, oxygen sag serve, de-oxygenation and Reoxygenation. Dilution in seawater, disposal by land treatment. Effluent irrigation and sewage farming. Sickness and its preventive measures. [4]

REFERENCES:

1. Punmia BC & Jain A.; "Waste Water Engg. (Environmental Engg.-II)",Laxmi Publications, New Delhi. 2001
2.Arcadio P. Sincero and Gregoria P. Sincero "Environmental Engg.- A design Approach", Prentice Hall of India, New Delhi. 2009.
3. Metcalf &Eddy ;"Waste Water Engineering - Treatment and Reuse" , TMH, New Delhi, 2013.
4. Howard S. Peavy Donald R. Rowe & George Tchobanoglous ;"Environmental Engg." , McGraw Hill, International Edition, 1985.
5. Garg S K, ; "Environmental Engineering (Vol. II)", Khanna Publishers, Delhi, 1999.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE-I

Course Title: ELEMENTS OF REMOTE SENSING, GIS AND GPS

Paper Code: CIV316

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding of various techniques and elements in in positioning systems.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various remote sensing techniques.

Part-A

Remote sensing and GIS integration- Principles of electromagnetic remote sensing, imaging characteristics of remote sensing systems, extraction of metric and descriptive information from remotely sensed images, integration of remote sensing and GIS.   [8]

Basic concepts of GIS- Information systems, spatial and non-spatial information, geographical concepts and terminology, advantages of GIS, basic components of GIS, commercially available GIS hardware and software, organization of data in GIS.   [10]

Part-B

GIS data- Field data, statistical data, Maps, aerial photographs, satellite data, points, lines and areas features, vector and raster data, advantages and disadvantages, data entry through keyboard, digitizers and scanners, digital data, pre-processing of data rectification and registration, interpolation techniques.   [12]

Applications of GIS- Map revision, land use, agriculture, forestry, archaeology, municipal geology, water resources, soil erosion, land suitability analysis, change detection   [6]

Part-C

GPS : Introduction, working principle, Various application of GPS related to Civil Engg., components of GPS – Point positioning and differential positioning.   [8]

Part-D

Data management- DBMS, various data models, run-length encoding, quadtrees, and data analysis-data layers, analysis of spatial and non-spatial data, data overlay and modeling, data processing: raster based and vector based, data presentation –hardcopy devices, softcopy devices.   [12]

REFERENCES:

1. Lo C P, Yeung A K W; "Concepts and Techniques of Geographic Information Systems", Prentice Hall. India, 2010

2. Kang-tsung Chang; "Introduction to Geographic Information Systems", Tata McGraw Hill, 2011.

DAV UNIVERSITY, JALANDHAR

Course Title: ARCHITECTURE AND TOWN PLANNING

Paper Code: CIV318

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding of various techniques in planning of any residential and industrial areas.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various steps involved in planning of town and its drawings.

Part-A

Town planning: Definition and meaning, scope and motives of planning, brief history of town planning, its origin and growth, historical development of town planning in ancient valley civilizations. Indus Nile Tigris and Euphrates, Greek Roman, Medieval, and renaissance period town planning. New towns in India- Chandigarh and Gandhi nagar. [8]

New concept: Garden city movement, linear city and concentric city concept. Neighbourhood and Radburn, la-cite industrial, radiant city [2]

Part-B

Origin of Modern Architecture: definition and concept of modern architecture, various pioneers of modern architecture. Different types of architectural scales and various types of building proportions. Building bylaws and development control .Terminologies-F.A.R, building line, setbacks [6]

Building Components: urban design and its relevance in civil engineering. Concept of heritage zones. Case study of Connaught place New Delhi. Principle of design: unity, rhythm, harmony, axis, symmetry [4]

Part-C

Preparation of Plans: Perspective plan (residential commercial, institutional, industrial) Master Plan, Development plan, Local planning area, implementation of plans, Role of public participation in plan formulation and implementation. [6]

Architectural materials: Low cost housing materials, use of materials in different types of development like technology park, Eco-friendly building materials, Role of C.B.R.I (Central building research institute), World Bank, and U.N -HABITAT. [6]

Part-D

Planning Practice for Smart cities: Intelligent transport system L.R.T.S, M.R.T.S, B.R.T.S, Metro rail, Zero waste management techniques, Safe cities concept. [8]

Metropolitan Planning and slum clearance: Mega cities and metropolitan cities, U.N.D.P Guidelines-relevance for Indian cities, Slum networking, housing in disaster prone areas, Achievements of PUDA,PIDB,JNNURM [6]

REFERENCES:

1. Kulshrestha S.K. (Ed. 2006), 'Dictionary of Urban and Regional Planning', Kalpaz Publications, Delhi.
2. Arora S.P. and S.P. Bindra (1997), "A Textbook of Building Construction", Dhanpat Rai & Sons, Delhi
3. Kadiyali, L. R. (1991),"Traffic Engineering and Transport Planning", Khanna Publishers, New Delhi

DAV UNIVERSITY, JALANDHAR

Course Title: THEORY OF STRUCTURE-3

Paper Code: CIV-320

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding of matrix methods used to analyse indeterminate structures.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of Flexibility and stiffness methods of structural analysis.

Part-A

Review of Determinants and Matrices: Introduction, summation convention, determinants and their properties, Cramer's rule, matrices and their properties, solution of non-homogeneous equations by matrix methods, differentiation and integration of a matrix.   [8]

Part-B

Flexibility method of Analysis: Introduction, method of consistent deformation, application to pinjointed frames, effect of temperature and pre-strain, displacements and forces in members of indeterminate structures, flexibility matrix of a plane member.   [12]

Part-C

Stiffness Method of Analysis: Introduction, relation between slope deflection method and stiffness method, choice between flexibility and stiffness method, stiffness method for members with relative displacement of supports, analysis of indeterminate structures, analysis of pin-Jointed frames.

[12]

Part-D

Computer Applications: Matrix structural analysis using spread sheets, MS Excel Matrix Commands, MS Excel procedure for stiffness method of analysis, analysis of single span beams, continuous beams, plane trusses and plane frames.   [10]

REFERENCES:

1. Gere W and Weaver J M; "Matrix Analysis of Structures" CBS Publishers, New Delhi, 1986.

2. Kanchi M B; "Matrix Methods of Structural Analysis" Wiley Eastern Limited, New Delhi, 2002.

3. Ganju T N; "Matrix Structural Analysis using Spreadsheets" TMH Publishing Co. Ltd. New Delhi,2002.

4. Vazirani V N and Ratwani M M; "Advanced Theory of Structures and Matrix Methods" Khanna Publishers, New Delhi, 1995.

5. Pandit G S and Gupta S P; "Structural Analysis A Matrix Approach" Tata McGraw Hill, New Delhi, 1994.

DAV UNIVERSITY, JALANDHAR

Course Title: TRAFFIC ENGINEERING

L	T	P	Credits
4	0	0	4

Paper Code: CIV322

Course Objective: This course should provide the students with good understanding of traffic planning and management.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of public transportation and transportation flow.

Part-A

Traffic Engineering and control-Review of various traffic surveys and traffic Studies; Statistical methods for traffic engineering and their applications - Distributions, sampling theory and Significance testing, Regression and Correlation; Intersection design-Principles, various available alternatives, rotary design, mini roundabout, traffic signals: types of traffic signals, advantages, determination of optimal cycle time and signal setting for an intersection with fixed time signals, co-ordination of signals, types, area traffic control, delay at signalized intersection. Accident and road safety: accident causes, recording system, analysis and preventive measures, accident cost, alternative methodologies for calculation. Traffic management- various measures and their scope, relative merits and demerits. Highway capacity: Passenger's car units, level of service, factor affecting capacity and level of service, influence of mixed traffic.   [12]

Part-B

Transportation Planning and management-Introduction to the process of urban transport planning. Travel demand forecasting=Trip generation analysis, trip classification, multiple regression analysis, category analysis. Modal split analysis: introduction, earlier modal split models, and modal split models with behavioural basis. Trip distribution analysis: introduction, methods of trip distribution, uniform and average factor method, Fratar method, Furness method, The Gravity model, Intervening and competing, Linear programming approach to trip distribution. Traffic Assignment: purpose of traffic assignment, traffic flow characteristics, Assignment techniques=All or nothing assignment, Multiple route assignment, Capacity restraint assignment, Diversion curves. Rout building algorithms. Land use transport models: Introduction, selection of Land-use transport models, The Lowry model, Grain – Lowry model, Applications of Lowry model.   [12]

Part-C

Theory of traffic flow- Scope, definitions and basic relationship, review of flow density speed studies, hydrodynamic analogies, Application of hydrodynamic analogy, Car following theory and its application to traffic engineering, probabilistic description of traffic flow, an introduction to queuing theory as applied to traffic flow problems for study state conditions, simulation studies.   [12]

Part-D

Transport Economics-Economic evaluation of highway schemes, need for economic evaluation, cost and benefits of transportation projects, basic principles of economic evaluation, Net present value method, benefit/cost ratio method, internal rate of return method. Vehicle operating costs, Value of travel time saving, Accident costs.   [6]

Public Transportation-Mass transit systems: Bus and rail transit, characteristic capacities.

Introduction to intelligent transportation systems-Introduction to advanced computational techniques for transportation planning.   [4]

REFERENCES:

1. Kadiyali L.R.; "Traffic engineering and transport planning", Khanna Publishers Delhi1990.
2. Pingnataro G.J.; "Principles of Traffic Engineering", McGraw Hill, 1970.
3. Wohl and Martin; "Traffic System Analysis for Engineering and Planners", McGraw Hill, 1983.
4. Hutchinson B.G.; "Introduction to Urban Transport Systems, Planning", McGraw Hill, 1970.
5. Fair and Williams; "Economics of Transportation", Harper & Bros., Publishers, NY, 1959.
6. Winfrey, Robley; "Economic Analysis for Highway", International Textbook Co., PA, USA, 1969.
7. ChakrabortyPartha and Das Animesh; " Principles of Transportation Engineering", Prentice Hall, India, 1990.
8. SaxenaSubhash; "A Course in Traffic Engineering and Design", DhanpatRai& Sons, 2007.
9. Manual of Economic Evaluation of Highway Projects in India (SP30), Indian Roads Congress

DAV UNIVERSITY, JALANDHAR

Course Title: FUNDAMENTALS OF EARTHQUAKE ENGINEERING

Paper Code: CIV324

L	T	P	Credits
3	0	0	3

Course Objective: This course should provide the students with good understanding of various types of behaviour of multi-story buildings under oscillations.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of load analysis of buildings and behaviour of building under earthquake conditions.

Note: Use of IS-13920 is allowed in the examination.

Part-A

Undamped free vibrations of single degree of freedom systems: Introduction, definitions, characteristics of a dynamic problem, degrees of freedom, Newton's law of motion, De Alembert's Principal, free body diagram, derivations of differential equation of motion, solution of differential equation of motion, equivalent stiffness of spring combinations, springs in series, springs in parallel.

[12]

Part-B

Damped free vibrations of single degree of freedom systems: Introduction, types of damping, free vibrations with viscous damping, over-damped, critically- damped and under- damped systems, logarithmic decrement, structural damping. [10]

Earthquake Resistant Design Philosophy: Introduction, criteria for earthquake resistant design, principles of reliable seismic behaviour, structural forms for earthquake resistance, earthquake forces versus other forces. [4]

Part-C

Lateral Load Analysis: Idealization of structures and selection of analysis, equivalent lateral force concepts, response spectrum analysis, seismic forces as per IS: 1893 – 1984 and IS: 1893 – 2000.

[6]

Introduction to provisions of IS 4326.

Introduction to provision of IS 13920. [4]

Part-D

Behaviour and Design of Concrete Structures: Characteristics of concrete and reinforcing steel, influence of bond and anchorage and confinement of concrete, Seismic design and detailing of reinforced concrete and masonry buildings (IS 13920; IS 13 827: IS 13828; IS 4326) and flexural strength and ductility of RC members, shear behaviour of RC members, beam column joints in moment resisting frames. Introduction to provisions of IS 1893-2002 Part-I for buildings. Estimation of lateral forces due to earthquake. [12]

REFERENCES-
1. Paz M "Structural Dynamics – Theory and Computation" CBS Publishers and Distributors, New Delhi, 2003.
2. Chopra A K "Structural Dynamics" John Wiley & Sons, New Delhi, 2002.
3. Dowrick D J "Earthquake Resistant Design for Engineers and Architects" John Wiley & Sons, New York, 2000.
4. Paulay and Priestley "Seismic Design of Reinforced Concrete and Masonry Buildings" John Wiley and sons, New York, 1992.
5. RaoS.S.,"Mechanical Vibrations" Pearson Education Publishers, 2004.

DAV UNIVERSITY, JALANDHAR

Course Title: NATURAL HAZARDS &DISASTER MANAGEMENT

L	T	P	Credits
3	0	0	3

Paper Code: CIV326

Course Objective: This course should provide the students with good understanding in various disaster managing steps.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of disaster reduction and various direct and indirect damages due to disaster.

Part-A

Introduction - Concepts and definitions: disaster, hazard, vulnerability, risk, capacity, impact, prevention, mitigation).   [3]

Disasters- Disasters classification; natural disasters (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.); manmade disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills etc); hazard and vulnerability profile of India, mountain and coastal areas, ecological fragility   [12]

Part-B

Disaster Impacts - Disaster impacts (environmental, physical, social, ecological, economical, political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs); hazard locations; global and national disaster trends; climate change and urban disasters.   [10]

Part-C

Disaster Risk Reduction (DRR)- Disaster management cycle – its phases; prevention, mitigation, preparedness, relief and recovery; structural and non structural measures; risk analysis, vulnerability and capacity assessment; early warning systems, Post-disaster environmental response (water, sanitation, food safety, waste management, disease control); Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster risk reduction, DRR programmes in India and the activities of National Disaster Management Authority.   [15]

Part-D

Disaster Management

Disasters, Environment and Development- Factors affecting vulnerability such as impact of developmental projects and environmental modifications (including of dams, land-use changes, urbanization etc.), sustainable and environmental friendly recovery; reconstruction and development methods.   [12]

REFERENCE:

1. http://ndma.gov.in/ (Home page of National Disaster Management Authority).

2. http://www.ndmindia.nic.in/ (National Disaster management in India, Ministry of Home Affairs).

3. SahniPardeep, "Disaster Risk Reduction in South Asia", Prentice Hall, 2004.

4. Singh B.K., "Handbook of Disaster Management: techniques & Guidelines", Rajat Publication, 2008.

5. Ghosh G.K., " Disaster Management", APH Publishing Corporation, 2006.

DAV UNIVERSITY, JALANDHAR

Course Title: ENVIRONMENTAL ENGINEERING-2 LAB

Paper Code: CIV310

L	T	P	Credits
0	0	2	1

1. To measure the pH value of a water/waste water sample.
2. To determine optimum Alum dose for Coagulation.
3. To find MPN for the bacteriological examination of water.
4. To find the turbidity of a given waste water/water sample
5. To find B.O.D, COD and D.O. of a given waste water sample.
6. Determination of Hardness of a given water sample
7. Determination of total solids, dissolved solids, suspended solids of a given water sample.
8. To determine the concentration of sulphates in water/wastewater sample.
9.   To find chlorides in a given sample of water/waste water.
10. To find acidity/alkalinity of a given water sample

DAV UNIVERSITY, JALANDHAR

Course Title: COMPUTER AIDED CONCRETE DRAWING

L	T	P	Credits
0	0	2	1

Paper Code: CIV312

Computer Aided Structural Drawings/Reinforcement detailing of

1. R.C.C. Footings
2. Beams curved in plan
3. Domes
4. Staircases
5. Retaining Walls
6. Water Tanks

These Drawings should be prepared by using Auto-CAD.

DAV UNIVERSITY, JALANDHAR

SEVENTH SEMESTER

Course Title: COMPOSITE MATERIALS

L	T	P	Credits
3	0	0	3

Paper Code: CIV401

Course Objective: This course should provide the students with good understanding of various types of composite materials used in construction like fibres.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various advanced materials like fibres, fly ash silica in civil engineering.

Part-A

FIBRE REINFORCED CONCRETE: Properties of Constituent Materials, Mix Proportions, Mixing and Casting Procedures, Properties of Freshly mixed FRC, Mechanics and properties of Fibre reinforced concrete, Composite Material approach, Application of fibre reinforced concrete.
[10]

Part-B

FLY ASH CONCRETE: Classification of Indian Fly ashes, Properties of Flyash, Reaction mechanism, Proportioning of flyash concretes, Properties of Flyash concrete in fresh and hardened state, Durability of flyash concrete. [8]

POLYMER CONCRETE: Terminology used in polymer concrete, Properties of constituent materials, Polymer impregnated concrete, Polymer modified concrete, Properties and applications of polymer concrete and polymer impregnated concrete. [8]

Part-C

FERRO CEMENT: Constituent materials and their properties, Mechanical properties of ferro cement, Construction techniques and application of ferro cement. [6]

HIGH PERFORMANCE CONCRETE: Materials for high performance concrete, Supplementary cementing materials, Properties and durability of high-performance concrete, Introduction to silica fume concrete, Properties and applications of silica fume concrete. [6]

Part-D

LIGHT WEIGHT CONCRETE: Properties of light weight concretes, Pumice concrete, Aerated cement mortars, No fines concrete, Design and applications of light weight concrete.

Recent developments in construction materials for Cladding, Waterproofing, Tiles, paints, Formwork, Decorative interiors etc. [8]

REFERENCES:
1. Concrete Technology-A.M. Neville
2. Concrete Technology-M.L. Gambhir

DAV UNIVERSITY, JALANDHAR

Course Title: DESIGN OF STEEL STRUCTURES-2

L	T	P	Credits
4	1	0	4

Paper Code: CIV403

Course Objective: This course should provide the students with good understanding of design of various types of steel structures.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design of steel foot bridge, Gantry girder etc.

Note: Use of IS-800 is allowed in the examination.

Part-A

Design of Round Tubular Structures: Introduction, round tubular sections, permissible stresses, tube columns and compression members, tube tension members, tubular roof trusses, Design of tubular beams, Design of tubular purlins. [14]

Part-B

Design of steel foot bridge: Introduction, design of flooring, cross girders, analysis of N- type truss, design of various members of truss, design of joints, design of bearings. [14]

Part-C

Design of complete industrial building with design of:

Gantry Girder
   • Column bracket.
   • Mill bent with constant moment of inertia
   • Lateral and longitudinal bracing for column bent etc. [14]

Part-D

Design of a single track through type Railway Bridge with lattice girders having parallel chords (for B. G):

Design of stringer
   • Design of cross girders
   • Design of connection between stringer and cross girder
   • Design of main girders – various members and their joints
   • Design of bottom lateral bracing and top lateral bracing
   • Design of portal bracing and sway bracing
   • Design of bearings – rocker and rollers [14]

REFERENCES:
   1. Duggal S.K.;"Limit state design of steel structures"
   2. SubramanianN.; "Design of steel structures"
   3. ChandraRam; "Design of steel structures (Vol. 2)"
   4. NegiL.S.; "Design of steel structures"
   5. Bhavikatti S.; "Design of steel structures (by limit state method as per IS: 800-2007)"5
   6. IS 800: 2007 (General construction in steel-Code of practice)
   7. SP: 6(1) (Handbook for structural engineers-Structural steel sections) permitted in Examination

DAV UNIVERSITY, JALANDHAR

Course Title: IRRIGATION ENGINEERING-2

Paper Code: CIV405

L	T	P	Credits
3	1	0	3

Course Objective: This course should provide the students with good understanding of various types of irrigation projects like weirs and barrages.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of canal regulation and design steps of irrigation projects like weirs and barrages.

Part-A

Head Works: Types of head works, Functions and investigations of a diversion head Work: component parts of a diversion head work and their design considerations, silt control devices.
[6]

Theories of Seepage: Seepage force and exit gradient, assumptions and salient features of Bligh's Creep theory, Limitations of Bligh's Creep theory, salient features of Lane's weighted Creep theory and Khosla's theory, Comparison of Bligh's Creep theory and Khosla's theory, Determination of uplift pressures and floor thickness. [6]

Part-B

Design of Weirs: Weirs versus barrage, types of weirs, main components of weir, causes of failure of weir and design considerations with respect to surface flow, hydraulic jump and seepage flow. Design of barrage or weir. [6]

Energy Dissipation Devices: Use of hydraulic jump in energy dissipation, Factors affecting design, Types of energy dissipaters and their hydraulic design. [6]

Part-C

Canal Regulators: Off take alignment, cross-regulators–their functions and design, Distributory head regulators, their design, canal escape. [6]

Canal Falls: Necessity and location, types of falls and their description, selection of type of falls, Principles of design, Design of Sarda type, straight glacis and Inglis or baffle wall falls. [4]

Part-D

Cross-Drainage works: Definitions, choice of type, Hydraulic design consideration, Aqueducts their types and design, siphon aqueducts – their types and design considerations, super passages, canal siphons and level crossing. [6]

Canal Out-lets: Essential requirements, classifications, criteria for outlet behaviours, flexibility, proportionality, sensitivity, sensitiveness, etc. Details and design of non modular, semi-modular and modular outlets. [6]

REFERENCES:
1. Garg S.K.; "Irrigation Engg. & Hydraulic Structure", Khanna Publishers, 2007 .
2. Sharma R.K.; "Design of Irrigation Structures" , Oxford IBH Pub, 2006.
3. Sahasrabudhe S.R.; "Irrigation Engg. and Hydraulics Structures", Katson publishing, 1996.
4. Khushlani K.B.; "Irrigation Practice and Design Vol. I to VII" , Oxford IBH Pub, 1995.
5. Modi P.N.; "Irrigation with Resources and with Power Engineering", Standard Book House, 1995.
6. Ivan E. Houk; "Irrigation Engg. Vol. I & II", John Wiley and sons, 2010

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVES-II

Course Title: DYNAMICS OF STRUCTURES

L	T	P	Credits
4	0	0	4

Paper Code: CIV409

Course Objective: This course should provide the students with good understanding of various types of systems like single degree and multiple degree of freedom system.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design parameters for various systems with different degree of freedom system and behaviour of different system under different kinds of loadings.

Part-A

Overview of structural dynamics: Fundamental objective of structural dynamic analysis - types of prescribed loadings - essential characteristics of a dynamic problem - method of discretization: lumped-mass procedure - generalized displacements - the finite-element concept   [4]

Single degree of freedom systems: Components of the basic dynamic system formulation of the equations of motion - direct equilibration using D'Alembert's principle - principle of virtual displacements - *generalized SDOF systems* - rigid body assemblage   [6]

Part-B

Free vibration response: Solution of the equation of motion - Undamped free vibrations - damped free vibrations - critical damping - under damped systems - over damped systems - negative damping.   [6]

Response to harmonic loading: Undamped system complementary solution - particular solution - general solution - response ratio - damped system - resonant response.   [2]

Response to periodic loading: Fourier series expression of the loading - response to the fourier series loading - exponential form of fourier series solution   [2]

Part-C

Response to impulsive loads: General nature of impulsive loads - sine-wave impulse – rectangular impulse - triangular impulse - shock load.   [4]

Response to general dynamic loading: Duhamel integral for an undamped system – numerical evaluation of the duhamel integral for an undamped system - response of damped systems - response analysis through the frequency domain   [6]

Part-D

Multi degree of freedom systems: Formulation of the MDOF equations of motion - selection of the degrees of freedom - orthogonality conditions - normal co-ordinates - uncoupled equations of motion - Undamped & damped - mode superposition procedure.   [8]

Continuous parameter systems: Vibration analysis by Rayleigh's method- basis of the method - approximate analysis of a general system - selection of the vibration shape - improved Rayleigh method.   [2]

Practical vibration analysis: Preliminary comments - stodola method - fundamental mode analysis – proof of convergence - analysis of second mode - analysis of third and higher modes – analysis of highest mode - Rayleigh's method in discrete co-ordinate systems.   [4]

REFERENCES:

1. Clouch R.W. &Penzien J., "Dynamics of Structures", McGraw Hill, 2005.
2. Weaver W., Jr. Timoshenko S.P., Young D.H, "Vibration Problem in Engineering", John Wiley, 2009.
3. Meivovitch L., "Elements of Vibration Analysis", McGraw Hill, 2007.
4. Seto W.W., "Mechanical Vibrations", Schaum's Outline Series, McGraw Hill, 2010.
5. Srinivasan P., "Mechanical Vibration Analysis", Tata McGraw Hill, 2000.
6. Chopra A.K.; "Dymanics of Structures", Prentice-Hall, 2011.
7. AgrawalPankaj, Shrikhande Manish, "Earthquake Resistant Design of Structures", Prentice Hall of India, 2011.

DAV UNIVERSITY, JALANDHAR

Course Title: GROUND IMPROVEMENT TECHNIQUES

L	T	P	Credits
4	0	0	4

Paper Code: CIV411

Course Objective: This course should provide the students with good understanding in various methods in ground improvement.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of different materials used in improving soil properties and various methods and techniques in improving soil properties.

Part-A

Introduction to soil improvement without the addition of materials - dynamic compaction equipment used - application to granular soils - cohesive soils - depth of improvement - environmental considerations - induced settlements - compaction using vibratory probes - vibro techniques vibro equipment - the vibro compaction and replacement process - control of verification of vibro techniques - vibro systems and liquefaction - soil improvement by thermal treatment - preloading techniques - surface compaction introduction to bio technical stabilization   [12]

Part-B

Introduction to soil improvement with the addition of materials - lime stabilization - lime column method - stabilization of soft clay or silt with lime - bearing capacity of lime treated soils - settlement of lime treated soils - improvement in slope stability - control methods - chemical grouting - commonly used chemicals - grouting systems - grouting operations - applications - compaction grouting - introduction - application and limitations - plant for preparing grouting materials - jet grouting - jet grouting process - geometry and properties of treated soils - applications - slab jacking - gravel - sand - stone columns   [12]

Part-C

Soil improvement using reinforcing elements- introduction to reinforced earth – load transfer mechanism and strength development - soil types and reinforced earth- anchored earth nailing reticulated micro piles - soil dowels - soil anchors - reinforced earth retaining wall   [10]

Part-D

Geotextiles - Behaviour of soils on reinforcing with geotextiles - effect on strength, bearing capacity, compaction and permeability - design aspects - slopes - clay embankments - retaining walls – pavements   [12]

REFERENCES:

1. Moseley, "Ground Improvement", Blackie Academic Professional, Chapman & Hall, 2006.
2. Boweven R., "Grouting in Engineering Practice", Applied Science Publishers Ltd,1999 .
3. Jewell R.A., "Soil Reinforcement with Geotextiles", CIRIA Special Publication, Thomas Telford, 2009.
4. Van Impe W.E., "Text Book On Soil Improvement Technique & Their Evolution", Balkema Publishers, 2010.
5. Donald .H. Gray &Robbin B. Sotir, "Text Book on Bio Technical & Soil Engineering Slope Stabilization", John Wiley, 2011.

DAV UNIVERSITY, JALANDHAR

Course Title: HYDROLOGY AND DAMS

Paper Code: CIV413

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding of utilization of water resources and their management.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design of different types of Dams and about their peak flow.

Part-A

Introduction, Precipitation: Importance of hydrological data in water resources planning. The hydrologic cycle. Mechanics of precipitation, types and causes, measurement by rain gauges, Gauge net-works, hyetograph, averaging depth of precipitation over the basin, mass-rainfall curves, intensity duration frequency curves, and depth area-duration curves.   Interception, Evapo-transpiration and Infiltration: Factors affecting interception, evaporation from free water surfaces and from land surfaces, transpiration, Evapo-transpiration. Infiltration Factors affecting infiltration, rate, Infiltration capacity and its determination.   [12]

Part-B

Runoff: Factors affecting runoff, run-off hydrograph, unit hydrograph theory, S-curve hydrograph, Snyder's synthetic unit hydrograph   [4]

Peak Flows: Estimation of Peak flow-rational formula, use of unit hydrograph, frequency analysis,   [4]

Gumbel's method, design flood and its hydrograph.   [4]

Part-C

Gravity Dams-Non Overflow Section: Forces acting, Stability factors, stresses on the faces of dam, Design of profile by the method of zoning, elementary profile of a dam.   [6]

Gravity Dams-Spillways: Creagers profiles neglecting velocity of approach, profile taking velocity of approach into account, upstream lip and approach ramp, Advantages of gated spillways, Discharge characteristics of spillways.   [4]

Part-D

Arch and Buttress Dams: Classification of arch dam- constant radius, constant angle and variable radius, Cylinder theory, Expression relating central angle and Cross-Sectional area of arch. Types of buttress dams, Advantages of buttress dams.   [6]

Earth Dams: Components of earth dams and their functions, phreatic line determination by analytical and graphical methods.   [4]

REFERENCE:

1. Nemec J.; "Engineering Hydrology" , Prentice Hall, 2007.
2. Stanley Buttler; "Engineering Hydrology", John. Wiley, 2011.
3. TODD; "Ground Water Hydrology", John. Wiley, 2007.
4. Creager Justin & Hinds; "Engineering for Dams Vol. II & III", John. Wiley, 2008.
5. Garg S.K.; "Hydrology", Khanna Pub, 1998.
6. Raghunath H.M.; "Hydrology Principles, Analysis and Design", New Age Int. Pub, 2000.

DAV UNIVERSITY, JALANDHAR

Course Title: BRIDGE ENGINEERING

L	T	P	Credits
4	0	0	4

Paper Code: CIV415

Course Objective: This course should provide the students with good understanding in construction design and maintenance of RCC Bridge.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of site investigation, specifications and selection of suitable type of Bridge.

Part-A

Introduction: Definition and components of a bridge, Classification of bridges, Choice of a bridge type. [4]

Investigation for Bridges: Need for investigation, Selection of bridge site, Determination of design discharge for River Bridge, Linear waterway, Economical span, Vertical clearance, scour depth, Afflux, Traffic projection. [6]

Part-B

Standard Specifications for Road Bridges: IRC Bridge Codes, Width of carriageway, Clearances, Dead load, I.R.C. standard live loads, Impact effect, Wind load, Longitudinal forces, Centrifugal forces, Horizontal forces due to water current, Buoyancy effect, Earth pressure, Deformation stresses, Erection stresses, Temperature effects, and Seismic force. [8]

Reinforced Concrete Bridges: Types of RCC bridges; Culverts - Box Culvert, Pipe Culvert, Solid slab bridge, T-beam girder bridges, Hollow girder bridges, Balanced cantilever bridges, Continuous girder bridges, Rigid frame bridges, Arch bridges, Pre-stressed concrete bridges. [4]

Part-C

Steel Bridges: Types of Steel bridges; Beam bridges, Plate girder bridges, Box girder bridges, Truss bridges, Arch bridges, Cantilever bridges, Cable stayed bridges, Suspension bridges. [6]

Sub-structure and Foundation: Piers and abutments, materials for piers and abutments, Types of foundations; Shallow, Pile, and Well foundations. Relative merits of piles and well foundations, Pneumatic Caissons, Box Caissons. [6]

Part-D

Bearings, Joints & Appurtenances: Importance of Bearings, Different types of bearings-Expansion Bearings, Fixed Bearings, Elastomeric Bearings, Expansion joints, Wearing Course, Approach Slab, Footpath, Handrails. [6]

Construction and Maintenance of Bridges: Methods of construction of concrete and steel bridges. Formwork and false work for concrete bridges, Causes of Bridge failures, Inspection and maintenance. [6]

REFERENCE:

1. Johnson, Victor, "Essentials of Bridge Engineering", Oxford University Press, 1998.
2. Khadilkar, C. H., "A Text book of Bridge Construction", Allied Publishers, 2005.
3. Rangwala, S. C., "Bridge Engineering", Charotar Publishing House Pvt. Ltd. 2003.
4. Raina, V. K., "Concrete Bridges Handbook", Shroff Publishers and Distributors, 2001.
5. Ponnuswamy, S. "Bridge Engineering", McGraw Hill Education, 2000.

DAV UNIVERSITY, JALANDHAR

Course Title: MINOR PROJECT

Paper Code: CIV417

L	T	P	Credits
0	0	6	4

Students are required to work on project in any of the areas related to Civil Engineering. The students will work 6 hrs per week with his / her supervisor(s).

Any one from following specialization:
- Environment Engineering
- Geo-Tech. Engineering,
- Transportation Eng.,
- Hydraulic Structures
- Structural Engineering.

DAV UNIVERSITY, JALANDHAR

Semester 8

Course Title: RAILWAY, AIRPORT AND HARBOUR ENGINEERING

L	T	P	Credits
3	1	0	3

Paper Code: CIV404

Course Objective: This course should provide the students with good understanding of railway and airport engineering.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various railways, airport and harbor components and their specification

Part-A

Introduction: History of development of Railways, Permanent Way, Requirement of ideal permanent way, cross-sections of single and double tracks in embankment and cutting.   [4]

Points and Crossing: Simple types currently in use: points and crossing terminology, layout plans of simple cross over, turnouts, diamond crossing, and geometric design of a simple turn out design of crossings & switches.   [6]

Part-B

Stations and yards: Selection of site for station and yards, different types of stations and yards and their layouts-way side station.   [4]

Permanent way Construction and Maintenance: Lying of track, relaying and dismantling, maintenance of track.   [4]

Signalling and Interlocking: Objects of signalling, types of signals, Interlocking and devices used in interlocking.   [4]

Part-C

Introduction: Airport classification, classification of flying activities. Characteristics & airport size.   [4]

Airport Planning: Types of runway patterns, running layout effect of metrological conditions, wind rose, specifications for runway clearances and other airport utilities.   [4]

Airport Grading & drainage: General considerations, master plan, grading design, selective grading, and classification of excavation, drainage purpose & data required, drainage structures & materials, drainage system.   [6]

Part-D

Pavement Design: Factors affecting pavement design, design method for flexible pavement(CBR, MC-leads, bur misters) design method for rigid pavements (water guard's analysis, I.R.C. methods)Joints in concrete pavements, design of level bars, tie bars, distribution steel, airport pavement overlays.   [6]

Docks and Harbors: Definition, location & layout of docks, classification of docks Simple description, frequent dealing with natural and artificial harbor, their classification & requirement, action of wind, water, tides and lateral drift on harbor structures.   [6]

REFERENCES

1. Rangawal S C "Railway Engineering" Charotar Publishers, Anand, 2002.
2. Arora S P and Saxena (2001), "Railway Engineering", DhanpatRai Publishers, New Delhi, 2001
3. Khanna, Arora and Jain "Airport Planning & Design" Nem Chand & Bros., Roorkee 2002
4. Horren Jeff, "Airport, Planning & Design" Chapman Hall, London, 2000.
5. Srinivasan R and Rangwala S C "Harbours" Charotar Publishers, Anand, 1999

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVES-III

Course Title: PLASTIC ANALYSIS OF STRUCTURES

L	T	P	Credits
4	0	0	4

Paper Code: CIV406

Course Objective: This course should provide the students with good understanding of plastic behaviour of different structures.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design consideration in plastic behaviour of multi-storeyed structure.

Part-A

Introduction: Ductility of metals: Concept of plastic design, Overloaded factors, Ultimate load as design coition. [8]

Part-B

Analysis of Indeterminate Structures: Hinge formation in indeterminate structures, Redistribution of moments, Assumption made for structure subjected to bending only. [8]

Part-C

Minimum Weight Design: Concept, assumption, Design of frame with prismatic members, Elements of linear programming and its application to minimum weight design problems. [10]

Deflection: Assumption, Calculation of deflection at ultimate loads, Permissible rotations. [4]

Part-D

Secondary Design Considerations: Influence of direct load, shear local bucking, lateral bucking, repeated loading and brittle fracture on moment capacity. Design of eccentrically loaded columns.Problem of incremental Collapse, Shake down analysis. Special considerations for design of structures using light gauge metals. [12]

REFERENCES
1. Neal B G "Plastic Methods of Structural Analysis" Chapman Hall, London, 1999.
2. ManikaSelvam V K "Limit Analysis of Structures" DhanpatRai Publications, New Delhi, 1997.
3. Arya A S and Ajmani J L "Design of Steel Structures" Nem Chand & Bros, Roorkee.1992.
4. Chandra R "Design of Steel Structures" Vol. I & II Standard Book House, Delhi, 1999.
5. M.P. Nielsen, "Limit Analysis and Concrete Plasticity" CRS Press, London, 1998.

DAV UNIVERSITY, JALANDHAR

Course Title: PAVEMENT DESIGN

L	T	P	Credits
4	0	0	4

Paper Code: CIV408

Course Objective: This course should provide the students with good understanding the types of various pavements used in civil engineering.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design of flexible as well as rigid pavements.

Note: Use of IRC: 37-2012 and IRC: 58-2011 shall be allowed in the examination.

Part-A

Introduction: Types of pavement structure. Functions of pavement components, Factors affecting pavement design, Design wheel load, and Strength characteristics of pavement materials. Comparison of flexible and rigid pavements.   [10]

Part-B

Design of Flexible Pavements: General design considerations, Methods for design of flexible pavements – Group Index Method, Triaxial Test Method, HveemStabilometer Method, McLeod's Method, and Indian Roads Congress Method.   [14]

Part-C

Design of Bituminous Mixes: Mix Design Approaches, Marshall Method of Bituminous Mix Design, Superpave   [8]

Design of Rigid Pavements: General design considerations, Westergard's Analysis, Methods for design of rigid pavements - PCA method, AASHTO Method, Indian Roads Congress Method, Types and design of Joints in cement concrete pavements.   [8]

Part-D

Modern Design Concepts: Reinforced Concrete Pavement, Airport Pavement Design, Bituminous Pavement with Cemented Base, Interlocking Concrete Block Pavement, Full Depth Bituminous Pavement, Ultrathin White Topping, Perpetual Pavement, Pavement Overlays.   [10]

REFERENCES:

1. Yoder, E. J., and M. W. Witczak, "Principles of Pavement Design", Wiley Publication, 2006.
2. Khanna, S. K., and C. E. G. Justo, "Highway Engineering", Nem Chand & Bros., Roorkee, 2004.
3. Sharma, S. K., "Principles, Practice and Design of Highway Engineering", S. Chand & Co. 2003
4. Chakraborty,P. and A.Das, "Principles of Transportation Engineering", Prentice Hall India, 2005
5. Yang H. Huang, "Pavement Analysis and Design", Prentice Hall, 2000.

DAV UNIVERSITY, JALANDHAR

Course Title: EARTH AND EARTH RETAINING STRUCTURES

L	T	P	Credits
4	0	0	4

Paper Code: CIV410

Course Objective: This course should provide the students with good understanding of various earth retaining structures and their design.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design procedure of earthen dams and their stability criteria.

Part-A

Earthen Dam: Introduction to Earthen dams, types of dams, selection of type of dam based on material availability, foundation conditions and topography [2]

Design details – crest, free board, upstream and downstream slopes, upstream and downstream slope protection – central and inclined cores – types and design of filters [4]

Seepage analysis and control – seepage through dam and foundations – control of seepage in earth dam and foundation [4]

Part-B

Earth pressure theories –Rankine's and Coulomb's earth pressure theories for cohesion less and cohesive backfills – computation of earth pressures for various cases – inclined – with surcharge – submerged and partly submerged – stratified backfills [6]

Rigid retaining structures –active and passive earth pressures against gravity retaining walls– computation of earth pressures by Trial wedge method – a mathematical approach for completely submerged and partly submerged backfills – Perched water table – importance of capability tension in earth pressure. [6]

Part-C

Graphical methods of earth pressure computation – trial wedge method for coulomb's and Rankine's conditions, for regular and irregular ground and wall conditions – Rebhan's construction for active pressure – friction circle method – logarithmic spiral method.

Design of gravity retaining wall – cantilever retaining walls [6]

Construction techniques – methods of construction – quality control Instrumentation – measurement of pore pressures [4]

Part-D

Flexible retaining structure –type and methods of construction–design strength parameters–safety factor for sheet pile walls – computation of earth pressures against cantilever sheet piles in cohesion less and cohesive soils – anchored sheet piles – free earth method – fixed earth method – Rowe's moment reduction method – stability of sheet piling [6]

Diaphragm walls and coffer dams – type of diaphragm walls and their construction techniques in various soil types – earth pressure on braced cuts and coffer dams – design of coffer dams [6]

REFERENCES:
1. Huntington, "Earth pressure on retaining walls"
2. Bowles, "Foundation Analysis and Design"
3. Jones, "Earth Reinforcements & Soil structures"
4. Prakash, Ranjan&Sasan, "Analysis & Design of Foundation & Retaining Structures"

DAV UNIVERSITY, JALANDHAR

Course Title: ADVANCE ENVIRONMENTAL ENGINEERING

Paper Code: CIV412

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding of different types of pollutions and their measures.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of different controlling methods of air, noise and water pollution.

Part-A

INTRODUCTION: Environment, Biosphere, Ecosystems; their interrelationships and pollution.

[4]

AIR POLLUTION & CONTROL: Air pollution, Physical & chemical fundamentals, Air pollution standards, Effects of air pollution; climate change, Air pollution meteorology, Atmospheric dispersion of pollutants, Indoor air quality models, Air pollution control of stationary & mobile sources. [6]

Part-B

NOISE POLLUTION & CONTROL: Introduction, Rating Systems, Sources & Criteria, Noise prediction and Control [10]

Part-C

SOLID WASTE MANAGEMENT: Perspectives & properties, collection, transfer & transport, Life cycle assessment, Disposal in a landfill, Waste to energy, Composting, Resource conservation & recovery for sustainability [12]

Part-D

HAZARDOUS WASTE MANAGEMENT: The hazard, risk, definition & classification RCRA &HSWA, CERCLA & SARA, Hazardous waste management, Treatment technologies, Land disposal, Groundwater contamination & remediation [12]

REFERENCES:
1. Davis & Cornwell, "Environmental Engineering", McGraw Hill Int Ed 1997.
2. Peavy, H.S, Rowe, D.R, Tchobanoglous, G, "Environmental Engineering", McGraw Hill, 2004.
3. E.P. Odum, "Fundamentals of Ecology", Oxford and IBH Pub. 1998.
4. Vesilind, Worrell and Reinhart, "Solid Waste Engineering", Cengage Learning India, 2001.
5. Rao and Rao, "Air Pollution", Tata McGraw Hill Pub, 2006.

DAV UNIVERSITY, JALANDHAR

DEPARTMENTAL ELECTIVE-IV

Course Title: PRE-STRESSED CONCRETE

Paper Code: CIV414

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding of manufacturing of precast concrete structures.
Learning Outcomes: After the completion of this course the participants would gain the knowledge of design for different pre-stresses and precast members like beams, slabs.

Note: IS 1343 is permitted in examination.

Part-A
Materials for pre-stressed concrete and pre-stressing systems: High strength concrete and high tensile steel – tensioning devices – pretensioning systems – post tensioning systems.   [10]

Part-B
Analysis of prestress and bending stresses: Analysis of prestress – resultant stresses at a sector – pressure line or thrust line and internal resisting couple – concept of load balancing – losses of prestress – deflection of beams.   [12]

Part-C
Strength of prestressed concrete sections in flexure, shear and torsion: Types of flexural failure – strain compatibility method – IS: 1343 code procedure – design for limit state of shear and torsion.   [12]

Part-D
Design of prestressed concrete beams and slabs: Transfer of prestress in pre tensioned and post tensioned members – design of anchorage zone reinforcement – design of simple beams – cable profiles – design of slabs.   [12]

REFERENCES:

1. N. Krishna Raju, "Prestressed concrete", Tata McGraw Hill, 2005.
2. T.Y. Lin, Ned H. Burns, "Design of Prestressed Concrete Structures", John Wiley & Sons, 2001.
3. P. Dayaratnam, "Prestressed Concrete", Oxford & IBH, 2003.
4. R. Rajagopalan, "Prestressed Concrete".
5. IS 1343 2012 Code of Practice for PrestressedConcrete

DAV UNIVERSITY, JALANDHAR

Course Title: ADVANCED FOUNDATION ENGINEERING

L	T	P	Credits
4	0	0	4

Paper Code: CIV416

Course Objective: This course should provide the students with good understanding in design of different types of sub structures

Learning Outcomes: After the completion of this course the participants would gain the knowledge of design steps involved in piles, piers towers and selection of suitable foundations.

Part-A

Soil exploration Introduction, standard penetration test, dynamic cone penetration test, staticcone penetration test, field vane shear test, large shear box test, field permeability test, Geophysical Tests, Dynamics properties of soil planning of soil exploration programme. [8]

Foundation Design-General Principles: Types of foundations, selection of type of foundation, basic requirements of a foundation, computation of loads, Design steps [6]

Part-B

Shallow Foundations: Introduction, bearing capacity of footings, skemptons bearing capacity factor, footings on layered soils, allowable bearing pressure, raft foundations floating raft, uplift capacity of footing, beams on elastic foundation, analysis of footing by finite difference. [8]

Pile Foundations: Introduction, bearing capacity of piles, vertical piles subjected to lateral loads, proportioning and design of pile foundations, lateral load capacity of single pile, batter piles under lateral load, uplift capacity of piles ultimate lateral load resistance of a pile group. [8]

Part-C

Drilled Piers: Introduction, current construction methods, use of Drilled Piers, analysis and design of drilled piers, settlements of drilled piers, structural design of drilled piers, laterally loaded drilled pier analysis. [8]

Bridge Sub Structures: Definitions, elements of substructures, maximum depth of scour, depth of foundation allowable bearing pressure, loads to be considered, lateral stability, design of pier cap & pier, sinking stresses in wells, design of well cap, well staining, well curb, cutting edge, bottom plug [8]

Part-D

Sheet Piles and Coffer Dams: Types of sheet piles structures, design of cantilever sheet pile wall, design of anchored bulkheads, anchorage methods design of braced sheeting in cuts, Design of cellular coffer dams. [6]

Foundations of Transmission Line Towers: Necessary information, forces on Tower foundations, General Design Criteria, choice & type of Foundation Design procedure.

Foundation in Expansive Soils: Introduction, Material structure, identification of expansive soils,Indian expansive soils, swell potential and swelling pressure, traditional Indian practice, methods of foundations in expansive soils, replacement of soils and CNS concept. Under reamed pile foundations, remedial measures for cracked buildings. [8]

REFERENCES:
1. Peck R B, Hanson W B and Thorn burn T H "Foundation Engineering" John Wiley and Sons Inc, New York, 1974
2. Teng W C "Foundation Design" Prentice Hall of India Pvt. Ltd., New Delhi, 1988.
3. Bowles J E "Foundation Analysis and Design" McGraw Hill, New York, 1988.
4. Ranjan G and Rao A S R "Basic and Applied Soil Mechanics" New Age InternationPvt. Ltd., Publishers, New Delhi, 2000
5. Saran S "Analysis and Design of Substructures", Oxford & IBH Publishing Co. (P) Ltd., New Delhi, 1996

DAV UNIVERSITY, JALANDHAR

Course Title: SOIL DYNAMICS

Paper Code: CIV418

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding in dynamic nature of soil and theory of vibrations.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of dynamic earth pressure and dynamic bearing capacity of soil.

Part-A
Introduction, Nature of Dynamic Loads, Theory of Vibrations.   [10]

Part-B
Dynamic Earth pressure and dynamic bearing capacity of shallow foundations.   [10]

Part-C
Liquefaction of Soils Wave propagation in elastic, homogeneous and isotropic medium Determining dynamic soil parameters.   [12]

Part-D
Machine foundations for reciprocating, impact type and Rotary machines. Vibration isolation and screening.   [12]

REFERENCES:

1. Barken D D "Dynamics of bases and foundations" McGraw Hill, New York, 1962.
2. Saran S "Soil Dynamics and Machine Foundations", Galogotia Publications Pvt. Ltd,New Delhi, 1999.
3. Rao N D V K "Vibration Analysis and Foundation Dynamics" Wheeler Publishing Div. of A. H. Wheeler & Co. Ltd. New Delhi, 1998.
4. Krammer S "Geotechnical Earthquake Engineering" Pearson Education Pvt. Ltd. New Delhi, 2003.
5. Prakash S "Soil Dynamics" McGraw Hill Book Company, New York, 1981.

DAV UNIVERSITY, JALANDHAR

Course Title: FLOOD CONTROL AND RIVER ENGINEERING

Paper Code: CIV420

L	T	P	Credits
4	0	0	4

Course Objective: This course should provide the students with good understanding in flood control and flood estimation.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of river modelling and river training works.

Part-A
River Engineering, Flood forecasting, Flood Estimation, Estimating Design flood, Empirical formulate, statistical or Probability methods, Unit hydrograph method   [10]

Part-B
Flood control and Economics of Flood control River Regime theories, River Modeling, Meandering
[12]

Part-C
River Training, Channel improvements; cut offs, River control structures Sediment load

[10]

Part-D
Resistance to flow, Social and environmental impacts.   [10]

REFERENCES:

1. R.J. Garde, K.G. RangaRaju, "Mechanics of Sedement Transportation and Alluvial Stream problems", Wiley Eastern Ltd. 2000.
2. V.A. Vanoni , "Sedimentation Engg", John Wiley and Sons, 2007.
3. A. Raudkivi, "Loose Boundary Hydraulics", Pergamon Press, Inc, 2000.
4. P.N. Modi, "Irrigation Water Resources and Water Power Engineering", Standard Book House, 2003.
5. Manual on rivers, their behaviour and Training, Pub No. 60, CBIP, New Delhi

DAV UNIVERSITY, JALANDHAR

Course Title: BUILDING MAINTENANCE AND REPAIR

Paper Code: CIV426

L	T	P	Credits
3	0	0	3

Course Objective: This course should provide the students with good understanding in performance, rehabilitation in concrete structure.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various methods of repairing and testing of various structures.

Part-A

Aging of structures
Performance of structures
Need for rehabilitation
Distress in concrete steel structures

[12]

Part-B

Damage assessment and Evaluation models
Damage testing methods – NDT, Core samples – Methods of repairs - Repair and maintenance of buildings

[12]

Part-C

IS standards - Bridge repairs - Seismic strengthening

[10]

Part-D

Rehabilitation methods - grouting – detailing
Imbalance of structural stability
Case studies.

[10]

REFERENCES:
1. RN Raikar, "Diagnosis and treatment of Structures in Distress", R and D Centre, Structural Designers and Consultants, New Bombay, India,1994.
2. VK Raina, "Concrete Bridge Practice Construction, Maintenance and Rehabilitation", 2nd Edition, Shroff Publishers and Distributors, August, 2010.
3. WH Ransom, "Building Failures, Diagnosis and Avoidance", 2nd Edition, E and F.N. Spon Publishers, December 1987.

DAV UNIVERSITY, JALANDHAR

Course Title: SEMINAR

L	T	P	Credits
0	0	3	2

Paper Code: CIV424

The seminar is based on research oriented topic. The evaluation is based upon the contents of topic and the presentation.

Generic Electives

DAV UNIVERSITY, JALANDHAR

Course Title: CONSTRUCTION MATERIALS AND TECHNIQUES

Course Code: CIV801

L	T	P	Credits
4	0	0	4

Course Objective: This course offers a good understanding and study of different materials and material properties in civil engineering.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various materials used in construction, their properties, uses and type of construction work for which they can be used.

Part-A

Building Stones: General, Uses of stones, natural bed of stones, qualities of a good building stone, deterioration of stones, artificial stones, common building stones of India and their uses. [4]

Bricks: General, Composition of good brick earth, Harmful ingredients in brick earth, qualities of good bricks, tests for bricks, classification of bricks. [4]

Timber: Definition, classification of trees, structure of a tree, felling of trees, seasoning of timber, storage of timber, market forms of timber. [4]

Part-B

Cement: Constituents of Cement, Manufacture of Portland cement [2]

Concrete : Introduction, Constituents of concrete, Batching of materials, Manufacturing process of cement concrete, workability and factors affecting it, Methods to determine workability, segregation and bleeding of concrete, Strength of concrete and factors affecting it. [4]

Part-C

Brick and stone masonry: Terms used, Types of bonds & their merits and demerits, rubble and ashlars joints in stone masonry, cement concrete hollow blocks and their advantages and disadvantage. [4]

Damp Proofing: Sources, causes and bad effects of dampness, preventive measures for dampness in buildings. [2]

Part-D

Plastering and pointing: Objects, Methods of plastering, Materials and types, Defects in plastering, special material for plastered surface, Distempering white washing and colour washing. [4]

Foundation: Definition, types of foundations [4]

REFERENCE:
1. Rangwala S.C. "EngineeringMaterials" Charotar Publishing House Anand India, 1989.
2. Bindra SP, Arora KR "Building construction" DhanpatRai Publications, Delhi 1970.
3. Shetty MS , "Concrete Technology" S. Chand & Co. N. Delhi, 2005
4. Punmia BC, "Building construction" Laxmi Publications Pvt. Ltd. 2008.
5. KumarSushil , "Building Construction" Standard Publishers Distributors, 2006

DAV UNIVERSITY, JALANDHAR

Course Title: RAILWAY AND TUNNEL ENGINEERING

L	T	P	Credits
4	0	0	4

Course Code: CIV802

Course Objective: This course should provide the students with good understanding of railway and Tunnel engineering.

Learning Outcomes: After the completion of this course the participants would gain the knowledge of various railways transportation components and specifications of tunnels

Part-A

Railways: History of development of Railways, Permanent Way, Requirement of ideal permanent way, cross-sections of single and double tracks in embankment and cutting.   [4]

Points and Crossing: Simple types currently in use: points and crossing terminology, layout plans of simple cross over, turnouts, diamond crossing,   [6]

Part-B

Stations and yards: Selection of site for station and yards, different types of stations and yards and their layouts-way side station.   [4]

Permanent way Construction and Maintenance: Laying of track, relaying and dismantling, maintenance of track.   [4]

Signaling and Interlocking: Objects of signalling, types of signals, Interlocking and devices used in interlocking.   [4]

Part-C

Tunnels: Definition and necessity of tunnels, Typical section of tunnels for a national highway and single and double broad gauge railway track.   [6]

Part-D

Ventilation: necessity and methods of ventilation, by blowing, exhaust and combination of blowing and exhaust. Drainage method of draining water in tunnels. Lighting of tunnels   [6]

REFERENCES

1. Rangawal S C "Railway Engineering" Charotar Publishers, Anand, 2002.
2. Arora S P and Saxena (2001), "Railway Engineering", DhanpatRai Publishers, New Delhi, 2001
3. Vaswani, NK, "Railway Engineering", Publishing House, Roorkee
4.Deshpande, R,"A Text Book of Railway Engineering", Poonam united Book Corporation
5.Subhash C Saxena "Tunnal Engineering",Dhanpat Rai and Sons, Delhi