DR.Y.S. PARMAR
GOVERNMENT PG COLLEGE NAHAN
DISTT. SIRMOUR HIMACHAL PRADESH

AQAR 2022-23

CRITERIA 1

MATRIX 1.3

KEY INDICATOR 1.3.1

Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum

TABLE OF CONTENTS

I. ENVIRONMENT AND SUSTAINABILITY

1.SANSKRIT

SECOND YEAR **DSC-1C** **SKT-DSC-201** **संस्कृत नाटक**	पूर्णांक : 100 (इक्डोल एवं प्राईवेट विद्यार्थी) पूर्णांक: 100 (70+30) (रेगुलर विद्यार्थी) लिखित परीक्षा 70 अंक आन्तरिक मूल्याकन : 30 अंक समय : तीन घण्टे
(A) Prescribed Course:	
Section 'A'	कर्णभारम् (सम्पूर्ण)
Section 'B'	अभिज्ञानशाकुन्तलम् : चतुर्थ अंक–कालिदास
Section 'C'	संस्कृत नाट्यशास्त्रीय पारिभाषिक शब्दावली
Section 'D'	संस्कृत नाटक का इतिहास तथा प्रमुख नाटकों का परिचय
(B) Unit-wise Division:	
	Section 'A' **कर्णभारम् (सम्पूर्ण)**
Unit I	कर्णभार नाटक का परिचय, सरलार्थ, व्याख्या, काव्य सौष्ठव और कथावस्तु।
Unit II	हिन्दी व्याकरण, हिन्दी से संस्कृत में सरल अनुवाद
	Section 'B' **अभिज्ञानशाकुन्तलम् : चतुर्थ अंक (कालिदास)**
Unit I	चतुर्थ अंक (क) परिचय, नांदी, प्रस्तावना, सूत्रधार, नटी, विष्कम्भक, विदूषक और कंचुकी आदि पारिभाषिक शब्दों की व्याख्या।
Unit II	चतुर्थ अंक (ख) व्याकरण, सरलार्थ, व्याख्या, काव्य–सौष्ठव और कथावस्तु तथा घटनाक्रम का समय निर्धारण एवं प्रकृति का मानवीकरण, अभिज्ञानशाकुन्तलम् का मनोवैज्ञानिक विश्लेषण, काव्येषु नाटकं रम्यम्, उपमा कालिदासस्य उक्तियों की समीक्षा।
	Section 'C' **संस्कृत नाट्यशास्त्रीय संस्कृत पारिभाषिक शब्दावली**
Unit I	नाटक, नायक, नायिका, पूर्वरङ्ग, सूत्रधार, नेपथ्य।
Unit II	अङ्क, स्वगत, प्रकाश, अपवारित, जनान्तिक, आकाशभाषित, प्रवेशक एवं भरतवाक्य।
	Section 'D' **संस्कृत नाटक का इतिहास तथा प्रमुख नाटकों का परिचय**
Unit I	उद्भव और विकास।
Unit II	प्रमुख नाटक एवं नाटककार (भास, कालिदास, शूद्रक, विशाखदत्त, हर्ष, भवभूति तथा उनकी रचनाएं।)

टिप्पणी – सभी वर्गों से प्रश्न पूछना अनिवार्य है।

2.COMMERCE

i. BC 3.1(c)

B.Com.: Year III

Paper BC 3.1(c): CORPORATE GOVERNANCE AND AUDITING

Duration: 3 hrs. **Marks: 70(Regular students)** **Lectures: 65**
100 (ICDEOL students)

Objective: The course aims to provide knowledge of Corporate Governance, Business Ethics and Corporate Social Responsibility principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of auditing.

Contents

UNIT	TOPIC	DETAILS
1	**Corporate Governance**	Evolution of Corporate Governance; Developments in India, Regulatory Framework of Corporate Governance in India, SEBI Guidelines on Corporate Governance; Reforms in Companies Act, Clause 49 and Listing Agreement. Corporate management vs. Governance; Internal constituents of the Corporate Governance.

41

		Theories & Models, Broad Committees; Major Corporate Scandals in India and Abroad- Relevant case Studies; Common Governance Problems Noticed in various Corporate Failures. Codes & Standards on Corporate Governance.
2	**Business Ethics**	Introduction to Business Ethics: The concept, nature and growing significance of Ethics in Business, Ethical principles in Business, Ethics in Management, Theories of Business Ethics. Codes of ethics, ethics committee Morality and ethics, business values and ethics. Ethical Issues in Business: Ethics in various Functional Areas of Business: Ethics in Finance, Ethics in HRM, Ethics in Marketing, Environmental Ethics.
3	**Corporate Social Responsibility (CSR)**	Concept of CSR, Corporate Philanthropy, CSR and Corporate Sustainability; CSR and Business Ethics, CSR provisions under the Companies Act 2013; CSR Committee; CSR Models, Codes, and Standards on CSR. Rating Agencies; Green Governance; Concept of Whistle blower.
4	**Introduction to Auditing**	Introduction, Meaning, Objectives, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure – Vouching and verification of Assets & Liabilities.
5	**Company Audit & Special Areas of Audit**	Audit of Limited Companies:- Company Auditor- Qualifications and disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties Auditor's Report- Contents and Types. Liabilities of Statutory Auditors under the Companies Act 2013. Special Areas of Audit:- Special features of Cost audit, Tax audit, and Management audit; Auditing Standards. Relevant case Studies/problems.

Suggested Readings:-

1. Ravinder Kumar and Virender Sharma, *Auditing Principles and Practice*, PHI Learning
2. Aruna Jha, *Auditing*. Taxmann Publication.

ii. B.C. 3.8

B.Com Year III

Paper BC 3.8: INDIAN ECONOMY

Duration: 3 hrs. **Marks: 70(Regular students)** **Lectures: 65**
100 (ICDEOL students)

Objective: This course seeks to enable the student to grasp the major economic problems in India and their solutions. It also seeks to provide an understanding of modern tools of macro-economic analysis and policy framework.

Contents:

UNIT	TOPIC	DETAILS
1	**Basic Issues and Features of Indian Economy**	Concept and Measures of Development and Underdevelopment; Human Development; Composition of national income and occupational structure
2	**Policy Regimes**	a) The evolution of planning and import substituting industrialization. b) Economic Reforms since 1991. c) Monetary and Fiscal policies with their implications on economy
3	**Growth, Development and Structural Change**	a) The experience of Growth, Development and Structural Change in different phases of growth and policy regimes across sectors and regions. b) The Institutional Framework: Patterns of assets ownership in agriculture and industry; Policies for restructuring agrarian relations and for regulating concentration of economic power;

80

		c) Changes in policy perspectives on the role of institutional framework after 1991. d) Growth and Distribution; Unemployment and Poverty; Human Development; Environmental concerns. e) Demographic Constraints: Interaction between population change and economic development.
4	**Sectoral Trends and Issues**	**a) Agriculture Sector**: Agrarian growth and performance in different phases of policy regimes i.e. pre green revolution and the two phases of green revolution; Factors influencing productivity and growth; the role of technology and institutions; price policy, the public distribution system and food security. **b) Industry and Services Sector**: Phases of Industrialisation – the rate and pattern of industrial growth across alternative policy regimes; Public sector – its role, performance and reforms; The small scale sector; Role of Foreign capital. **c) Financial Sector**: Structure, Performance and Reforms. Foreign Trade and balance of Payments: Structural Changes and Performance of India's Foreign Trade and Balance of Payments; Trade Policy Debate; Export policies and performance; Macro Economic Stabilisation and Structural Adjustment; India and the WTO, Role of FDI, Capital account convertibility,
5	**Inflation, Unemployment and Labour Market**	Inflation: Causes of rising and falling inflation, inflation and interest rates, social costs of inflation; Unemployment – natural rate of unemployment, frictional and wait unemployment. Labour market and its interaction with production system; Phillips curve, the trade-off between inflation and unemployment, sacrifice ratio, role of expectations adaptive and rational.

Suggested Readings:-

1. Mishra and Puri, Indian Economy, Himalaya Paublishing House
2. IC Dhingra, Indian Economy, Sultan Chand & Sons
3. Gaurav Dutt and KPM Sundarum, Indian Economy, S. Chand & Company.
4. Uma Kapila (ed), "Indian Economy since Independence", Relevant articles.
5. Bhagwati, J. and Desai, P. India: Planning for industrialization, OUP, Ch 2.
6. Patnaik, Prabhat. Some Indian Debates on Planning. T. J. Byres (ed.). The Indian Economy: Major Debates since Independence, OUP.
7. Ahluwalia, Montek S. State-level Performance under Economic Reforms in India in A. O. Krueger. (ed.).

3.BOTANY

iii. BOTA 101 Biodiversity

I Year

DSC: Botany Paper I
Biodiversity (Microbes, Algae, Fungi and Archegoniates)
(BOTA 101) (Credits: Theory-4, Practicals-2)

THEORY Lectures: 60

Unit 1: Microbes **(7 Lectures)**

Viruses – Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance; Bacteria – Discovery, General characteristics and cell structure; Reproduction – vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.

Unit 2: Algae **(12 Lectures)**

General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Brief account of classification of algae; Morphology and life-cycles of the following: *Nostoc*, *Oedogonium*, *Vaucheria, Ectocarpus, Polysiphonia*. Economic importance of algae

Unit 3: Fungi **(12 Lectures)**

Introduction- General characteristics, ecology and significance, range of thallus organization, cell wall composition , nutrition, reproduction and classification; Morphology and life cycles of *Phytophthora*, *Rhizopus* (Zygomycota) *Penicillium, Venturia* (Ascomycota), *Puccinia, Agaricus* (Basidiomycota); Symbiotic Associations-Lichens: General account, reproduction and significance.

Unit 4: Bryophytes **(9 Lectures)**

General characteristics, adaptations to land habit, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. (Developmental details not to be included). Ecology and economic importance of bryophytes with special mention of *Sphagnum*.

Unit 5: Pteridophytes **(10 Lectures)**

General characteristics, Early land plants (*Cooksonia* and *Rhynia*). Classification (up to family), morphology, anatomy and reproduction of *Selaginella*, *Equisetum* and *Adiantum*. (Developmental details not to be included). Heterospory and seed habit, stelar evolution. Ecological and economical importance.

Unit 6: Gymnosperms **(10 Lectures)**

General characteristics, Classification (up to family), Morphology, anatomy and reproduction of *Cycas* and *Pinus* (Developmental details not to be included). Economic importance.

NOTE: The question paper will be divided into four sections as follows:
Section A: Algae, Section B- Fungi, Section C – Microbes and Bryophytes and Section D- Pteridophytes and Gymnosperms.

Practical (BOTA 101)

1. EMs/Models of viruses – T-Phage and TMV, Line drawing/Photograph of Lytic and LysogenicCycle.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium; Binary Fission; Conjugation; Structure of root nodule.
3. Gram staining
4. Study of vegetative and reproductive structures of *Nostoc, Chlamydomonas* (electron micrographs), *Oedogonium, Vaucheria, Ectocarpus* and *Polysiphonia* through temporary preparations and permanent slides.
5. *Phytophthora, Rhizopus* and *Penicillium*: Asexual stage from temporary mounts and sexual structures throughpermanent slides.
6. *Venturia:* Specimens/photographs
7. *Puccinia*: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves;section/tease mounts of spores on Wheat and permanent slides of both the hosts.
8. *Agaricus*: Specimens of button stage and full grown mushroom; Sectioning of gills of *Agaricus*.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose)
10. Mycorrhiza: ecto mycorrhiza and endo mycorrhiza (Photographs)
11. ***Marchantia***- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup,w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
12. ***Funaria***- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, l.s. capsule and protonema.
13. ***Selaginella***- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
14. ***Equisetum***- morphology, t.s. internode, l.s. strobilus, t.s. strobilus, w.m. sporangiophore, w.m. spores (wet and dry)(temporary slides); t.s rhizome (permanent slide).

15. *Adiantum*- morphology, t.s. rachis, v.s. sporophyll, w.m. sporangium, w.m. spores (temporary slides), t.s. rhizome, w.m. prothallus with sex organs and young sporophyte (permanent slide).

16. ***Cycas***- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).

16. ***Pinus***- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarfshoot, t.s. needle, t.s. stem, , l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores(temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

17. **Field visits**

Suggested Readings

1. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
2. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
3. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
4. Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
7. Thakur, A.K. and Bassi, S.K. (2008). Diversity of Microbes and Cryptogams. S. Chand & Co., Delhi.
8. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
9. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.

iv. BOTA 102 Plant Ecology and Taxonomy

DSC Botany –Paper II
Plant Ecology and Taxonomy
(BOTA 102)

(Credits: Theory-4, Practicals-2)

THEORY **Lectures: 60**

Section A

Unit 1: Introduction **(2 Lecture)**

Unit 2: Ecological Factors **(13 Lectures)**

Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature, Shelford law of tolerance. General account of adaptations in xerophytes and hydrophytes.

Section B

Unit 3: Plant communities **(5 Lectures)**

Characters; Ecotone and edge effect; Succession; Processes and types (Hydrosere and Xerosere)

Unit 4: Ecosystem **(10 Lectures)**

Structure; energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling- Cycling of Nitrogen and Phosphoros.

Section C

Unit 5: Introduction to plant taxonomy (3 Lectures)

Identification, Classification, Nomenclature.

Unit 6 : Identification (5 Lectures)

Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access

Unit 7 : Taxonomic evidences from cytology, phytochemistry and molecular data. 6 Lectures

Unit 8: Taxonomic hierarchy (2 Lectures)

Ranks, categories and taxonomic groups

Section D

Unit 9: Botanical nomenclature (6 Lectures)

Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations

Unit 10: Classification (5 Lectures)

Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series), Angiosperm Phylogeny Group (APG) - general introduction

Unit 11: Biometrics, numerical taxonomy and cladistics (3 Lectures)

Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences).

Practical (BOTA 102 PR)

1.Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.

2.Determination of pH, and analysis of two soil samples for carbonates, organic matter.

3.Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.

4.(a) Study of morphological adaptations of hydrophytes and xerophytes (four each).

(b)Study of biotic interactions of the following: Stem parasite (*Cuscuta)*, Root parasite (Orobanche), Epiphytes, Predation (Insectivorous plants)

5.Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)

6.Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer`s frequency distribution law

7.Study of vegetative and floral characters of the following flowers s(Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification):

i. Ranunculacaceae: *Ranunculus/Delphinium*
ii. Brassicaceae :*Brassica/Alyssum/Iberis*
iii. Malavaceae: *Hibiscus/Abutilon*
iv. Asteraceae: *Helianthus/sonchus*
v. Fabaceae: *Lathyrus/Pisum*
vi. Rosaceae: *Rosa/Prunus*
vii. Apiaceae: *Coriandrum*
viii. Apocynaceae: *Vinca/Nerium*
ix. Solanaceae: *Solanum/ Petunia*
x. Lamiaceae; *Ocimum/Salvia*
xi. Lilliaceae: *Asparagus/Allium*
xii. Poaceae: *Zea mays/Triticum aestivum*

8. Field visit/ Visit to nearby Botanical Garden
9. Mounting of a properly dried and pressed specimen of any wild angiosperm with herbarium label.

Suggested Readings

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition. 2.Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India.
2. Simpson, M.G. (2006). *Plant Systematics*. Elsevier Academic Press, San Diego, CA,

U.S.A.

3. Singh, G. (2012). *Plant Systematics:* Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

v. BOTA 306 Medicinal Botany and Ethnobotany

Medicinal Botany and Ethnobotany

(BOTA 306)

(Credits 4) **Lectures 45**

SECTION A

Unit 1: Traditional Systems of Medicine: Brief history of use of medicinal herbs; Introduction to indigenous systems of medicines- Ayurveda, Unani and Siddha system of medicine.

(5 Lectures)

Unit 2: Ethnobotany: Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. **(5 Lectures)**

SECTION B

Unit 3: **Plants Used by the Tribals:** a) Food plants b) intoxicants and beverages c) Resins and oils and miscellaneous uses. d Sacred plants **(4 Lectures)**

Unit 4: Methodology of Ethnobotanical Studies: a) Field work b) Herbarium c) Ancient Literature d) Archaeological findings e) temples and sacred places. **(7 Lectures)**

SECTION C

Unit 5: Role of ethnobotany in modern Medicine

Medico-ethnobotanical sources in India; Significance of the following plants in ethno botanical practices (along with their habitat and morphology) a) *Azadiractha indica* b)*Ocimum sanctum* c) *Vitex negundo*. d) *Gloriosa superba* e) *Tribulus terrestris* f) *Pongamia pinnata* g) *Cassia auriculata* h) *Indigofera tinctoria*. Role of ethnobotany in modern medicine with special example *Rauvolfia sepentina, Taxus wallichiana, Trichopus zeylanicus, Artemisia, Withania*.

(13 Lectures)

SECTION D

Unit 6: Role of ethnic groups in conservation of plant genetic resources. Endangered taxa and forest management (participatory forest management). **(3 Lectures)**

Unit 7: Ethnobotany and Legal Aspects: Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge.

(8 Lectures)

vi. BOTA 307 Mushroom Cultivation Technology

Mushroom Cultivation Technology

(BOTA 307)

(Credits 4) Lectures: 45

SECTION A

Unit 1: Introduction, history. Nutritional and medicinal value of edible mushrooms; Nutrition and nutraceuticals – Proteins, amino acids, mineral elements nutrition, carbohydrates, crude fibre content , vitamins; Poisonous mushrooms. **(10 Lectures)**

SECTION B

Unit 2: Cultivation Technology : Infrastructure: substrates (locally available) Polythene bag,vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. Pure culture: Medium, Sterilization, Preparation of spawn, Multiplication. **(12 Lectures)**

SECTION C

Unit 3: Cultivation practices of *Agaricus bisporus*, *Pleurotus* sp. and *Volvoriella volvacea*. Composting technology in mushroom production, Low cost technology, Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation. **(12 Lectures)**

SECTION D

Unit 4: Storage: Short-term storage (Refrigeration - upto 24 hours) Long termStorage (canning, pickels, papads), drying, storage in salt solutions. **(4 Lectures)**

Unit 5: Food Preparation: Types of foods prepared from mushroom. Research Centres -National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value **(4 Lectures)**

Unit: 6 Diseases and Pests of Mushrooms **(3 Lectures)**

Suggested Readings

1. Biswas, S., Datta, M. and Ngachan, S.V. 2012. Mushrooms: A Manual for Cultivation. PHI Learning Private Limited, New Delhi.
2. Kapoor, J.N. 2010. Mushroom Cultivation. ICAR, New Delhi.
3. Nita Bahl (2000) Hand book of Mushrooms. Oxford & IBH Publishing Co. Pvt. Ltd.
4. Singh, M., Vijay, B., Kamal, S. and Wakchaure (Eds.) 2011. Mushrooms: Cultivation, Marketting and Consumption. Directi\orate of Mushroom Reseaerch (ICAR), Solan
5. Tewari, Pankaj and Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

4.MUSIC VOC AND INST

vii. BA 2nd year MUSA 203th,204 PR

COURSE CODE MUSA203TH
Hindustani Music
B.A.2nd Year

3 lectures/ week

Duration	Paper-IV Theory (Unit-I)	Max Marks	Credits
3 hours		50 (35 + 15 Assesment)	3

Title-Theory of Indian Music, Medieval Granthas& Contribution of Musicians & Musicologists.

There will be three sections, candidates shall have to answer one question from each section & two from any of the three sections thus five questions in all.

SECTION-I

Theory of Indian Music-

General discussion & definition of the following:-

a. Ãlãp- Jor- Jhãla, Thumri, Dãdra, Tappa, SandhiPrakashRãga, ParmelpraveshakRãga-

b. Detailed study of Rãgas (Rãga Bageshree, Jaunpuri , Miyan Malhar) s

c. Study of following Tâlas(Chautâla , Rupak, Kherva)

d. Essay on RãgakaSamaySiddhant

SECTION-II

Study of following Granthas:-

Sangeet-Parijat, SwarmelKalanidhi, Chaturdandi Prakshika.

SECTION-III

Life & Contributions of the following:-

VidushiKishoriAmonkar, Pt.Nikhil Banerjee, UstadVilayat Khan

viii. BA 2nd year MUSA 204 PR

COURSE CODE MUSA204PR
B.A.2nd Year Hindustani Music
Paper-IV Practical (Unit-II)
Title-Viva-Voce

3 lectures/ week

Max Marks	Credits
50(35+15 Assessment)	3

Rãga – Bageshri, Jaunpuri, Miyan Malhar

1. One VilambitKhyâl/ MaseetKhani Gat in any of the Rãgas.
2. MadhyalayaKhyâl/ Razakhani Gat in all the Rãgas.
3. Dhrupad/Dhamar in any one of the Rãgas or Drut Gat in any Tâla(other than Teentâla)
4. Ability to recite the Thekas of Chautâl, Rupak, Kaherva ,
5. Knowledge of playing National Anthem or Himachali Folk songs on

5.CHEMISTRY

ix. CHEM204 FUEL CHEMISTRY & CHEMISTRY OF COSMETICS & PERFUMES

11. Robinson, J.W. Undergraduate Instrumental Analysis 5th Ed., Marcel Dekker, Inc., New York (1995).

CHEM 204
FUEL CHEMISTRY
&
CHEMISTRY OF COSMETICS & PERFUMES

Max. Marks: 80 **Time allowed: 03 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of 15 marks each and may contain more than one part. Section E will be of 20 marks and consists of 10 objective type questions (in MCQ/true and false / fill in the blanks) of one mark each and 5 short answer questions of two marks each covering the entire paper.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION-A

Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value.
Coal: Uses of coal (fuel and nonfuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications. (18 Hours)

SECTION-B

Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Lubricants: Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination. (18 Hours)

SECTION-C

x. CHEM 302TH INDUSTRIAL CHEMISTRY AND ENVIRONMENT

2. Preparation of any two of the following complexes and measurement of their conductivity:
   (i) tetraamminecarbonatocobalt (III) nitrate
   (ii) tetraamminecopper (II) sulphate
   (iii) potassium trioxalatoferrate (III) trihydrate
3. **Colorimetry**

Draw calibration curve (absorbance at λmax vs. concentration) for various concentrations of a given coloured compound ($KMnO_4$/ $CuSO_4$) and estimate the concentration of the same in a given solution.

Reference Books:

1. A.I. Vogel: Qualitative Inorganic Analysis, Prentice Hall, 7th Edn.
2. A.I. Vogel: Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
3. Vogel, A.I., Tatchell, A.R., Furnis, B.S., Hannaford, A.J. & Smith, P.W.G., Textbook of Practical Organic Chemistry, Prentice-Hall, 5th edition, 1996.
4. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry Orient-Longman, 1960.

CHEM 302TH
INDUSTRIAL CHEMISTRY AND ENVIRONMENT

Max. Marks: 50 **Time Allowed: 3 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of **10** marks each and may contain more than one part. Section E will be of **10** marks and consists of objective type questions (MCQ/true and false / fill in the blanks etc.) of **one** mark each covering the entire paper.*

2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION – A

Industrial Gases and Inorganic Chemicals

(16 Hours)

SECTION - C

Water Pollution: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems.
Water purification methods. Effluent treatment plants (primary, secondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, agro, fertilizer, etc. Sludge disposal.
Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, electro dialysis, ion exchange). Water quality parameters for waste water, industrial water and domestic water. (16 Hours)

SECTION - D

Energy & Environment
Sources of energy: Coal, petrol and natural gas. Nuclear Fusion / Fission, Solar energy, Hydrogen, geothermal, Tidal and Hydel, etc.
Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management.
Biocatalysis: Introduction to biocatalysis: Importance in "Green Chemistry" and Chemical Industry. (14 Hours)

Reference Books:

1. E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
2. R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
3. J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
4. S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
5. K. De, Environmental Chemistry: New Age Inter0national Pvt., Ltd, New Delhi.
6. S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi

xi. CHEM 302PR INDUSTRIAL CHEMISTRY AND ENVIRONMENT LAB

LAB COURSE

CHEM 302PR

INDUSTRIAL CHEMISTRY AND ENVIRONMENT LAB

TIME ALLOWED: 03 HOURS
Max Marks: 20 **Credits – 2**

1. Determination of dissolved oxygen in water.
2. Determination of Chemical Oxygen Demand (COD)

35

3. Determination of Biological Oxygen Demand (BOD)
4. Percentage of available chlorine in bleaching powder.
5. Measurement of chloride, sulphate and salinity of water samples by simple titration method ($AgNO_3$ and potassium chromate).
6. Estimation of total alkalinity of water samples (CO_3^{2-}, HCO_3^-) using double titration method.
7. Measurement of dissolved CO_2.
8. Study of some of the common bio-indicators of pollution.
9. Estimation of SPM in air samples.
10. Preparation of borax/ boric acid.

Reference Books:

1. E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
2. R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
3. J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
4. S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
5. K. De, Environmental Chemistry: New Age International Pvt. Ltd, New Delhi.
6. S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.

xii. CHEM307 CHEMICAL TECHNOLOGY & SOCIETY AND BUSINESS SKILLS FOR CHEMISTRY

CHEM 307
CHEMICAL TECHNOLOGY & SOCIETY and BUSINESS SKILLS FOR CHEMISTRY

Max. Marks: 70 **Time allowed: 03 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of 15 marks each and may contain more than one part. Section E will be of 10 marks and consists of 10 objective type questions (in MCQ/true and false / fill in the blanks) of **one** mark each covering the entire syllabus of the paper.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION-A

Chemical Technology

Basic principles of distillation, solvent extraction, solid-liquid leaching and liquid-liquid extraction, separation by absorption and adsorption. An introduction into the scope of different types of equipment needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology. (18 Hours)

SECTION-B

Society

Exploration of societal and technological issues from a chemical perspective. Chemical and scientific literacy as a means to better understand topics like air and water (and the trace materials found in them that are referred to as pollutants); energy from natural sources (i.e. solar and renewable forms), from fossil fuels and from nuclear fission; materials like plastics and polymers and their natural analogues, proteins and nucleic acids, and molecular reactivity and interconversions from simple examples like combustion to complex instances like genetic engineering and the

CHEM 307
CHEMICAL TECHNOLOGY & SOCIETY and BUSINESS SKILLS FOR CHEMISTRY

Max. Marks: 70 **Time allowed: 03 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of 15 marks each and may contain more than one part. Section E will be of 10 marks and consists of 10 objective type questions (in MCQ/true and false / fill in the blanks) of **one** mark each covering the entire syllabus of the paper.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION-A

Chemical Technology

Basic principles of distillation, solvent extraction, solid-liquid leaching and liquid-liquid extraction, separation by absorption and adsorption. An introduction into the scope of different types of equipment needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology. (18 Hours)

SECTION-B

Society

Exploration of societal and technological issues from a chemical perspective. Chemical and scientific literacy as a means to better understand topics like air and water (and the trace materials found in them that are referred to as pollutants); energy from natural sources (i.e. solar and renewable forms), from fossil fuels and from nuclear fission; materials like plastics and polymers and their natural analogues, proteins and nucleic acids, and molecular reactivity

xiii. CHEM308 PESTICIDE CHEMISTRY & PHARMACEUTICAL CHEMISTRY

CHEM 308
PESTICIDE CHEMISTRY & PHARMACEUTICAL CHEMISTRY

Max. Marks: 70 **Time allowed: 03 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of **15** marks each and may contain more than one part. Section E will be of **10** marks and consists of 10 objective type questions (in MCQ/true and false / fill in the blanks) of **one** mark each covering the entire syllabus of the paper.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION-A

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship. (12 Hours)

SECTION-B

Synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor). (15 Hours)

SECTION - C

Drugs & Pharmaceuticals Drug discovery, design and development; Basic Retrosynthetic approach. Synthesis of the representative drugs of the following classes: analgesics agents, antipyretic agents, antiinflammatory agents (Aspirin, paracetamol, Ibuprofen); antibiotics (Chloramphenicol); antibacterial and antifungal agents (Sulphonamides; Sulphanethoxazol, Sulphacetamide, Trimethoprim); antiviral agents (Acyclovir), Central Nervous System agents (Phenobarbital, Diazepam),Cardiovascular (Glyceryl trinitrate), antilaprosy (Dapsone), HIV-AIDS related drugs (AZT- Zidovudine). (18 Hours)

SECTION -D

Fermentation Aerobic and anaerobic fermentation. Production of (i) Ethyl alcohol and citric acid, (ii) Antibiotics; Penicillin, Cephalosporin, Chloromycetin and Streptomycin, (iii) Lysine, Glutamic acid, Vitamin B2, Vitamin B12 and Vitamin C (15 Hours)

6.ENGLISH

xiv. B.A. I Year, Compulsory English ENG CEL 101

Department of English

B.A. with English

Undergraduate YEARLY Programme

Syllabus
(Effective from the Academic Session 2018-19)

First Year

		UNIT-II i. "The Parrot in the Cage" ii. "Dinner for the Boss" iii. "The Reddening Tree" iv. "At the Himalayas" v. "The Value of Silence" **Stories** and **Essays** from *Life Unfolded.* Ed. V. K. Khanna and Meenakshi F. Paul. New Delhi: Oxford University Press.	

xv. B.A. II Year, Compulsory English ENG CEL 201

Second Year

Year	Paper Code	Course Name & Syllabus	Credits
II	ENG CE 201	**English-2 Core English (Compulsory) for B.A & B.Com.** **UNIT-I Essays** i. "The Power of Prayer" by A. P. J. Abdul Kalam ii. "Vivekananda: The Great Journey to the West" by Romain Rolland iii. "More Than 100 Million Women are Missing" by Amartya Sen iv. "On the Ignorance of the Learned" (Excerpts by William Hazlitt) v. "Simply Living" (Excerpts by Ruskin Bond). (Nos. 'i' to 'v' are from *Reflections from the East and the West* by Pankaj K. Singh and Girija Sharma. Orient Blackswan) vi. "Towards Creating a Poverty-Free World" by Muhammad Yunus (From *Gleanings from Home & Abroad.* Orient Blackswan) vii. "Climatic Change and Human Strategy" by E.K. Federov.	6

7.PHYSICAL EDUCATION

xvi. PED 101 INTRODUCTION TO PHYSICAL EDUCATION

COURSE CONTENTS IN DETAIL

Year-I

THEORY COURSE

COURSE CODE: PED101TH **(DSC-1A)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=50+CCA=30) =80

INTRODUCTION TO PHYSICAL EDUCATION

Unit-I Introduction

1. Meaning, Definition, Need and Scope of Physical Education.
2. Aim and Objectives of Physical Education.
3. Importance of Physical Education in present era.
4. Misconceptions about Physical Education.
5. Relationship of Physical Education with General Education.
6. Physical Education as an Art and Science.

Unit-II

1. Historical Development of Physical Education in India {Pre-Independence-(Ancient India, Medieval and British Period)}.
2. Physical Education in India (Post-Independence).
3. Contribution of Akhadas, Vyayamshalas and Y.M.C.A.
4. Modern Perspectives: National Awards/State Awards and Honours, Arjuna Award, Rajiv Gandhi Khel Ratna Award, Dronacharya Award, M.A.K.A. Trophy and Parshu Ram Award.
5. Eminent Sports Personalities of different games.

Unit-III Biological Basis of Physical Education

1. Growth and Development, Differences between growth and development, Factors affecting growth and development.
2. Anatomical and Physiological Differences between Male and Female.
3. Effects of Heredity and Environment on Growth and Development.

8.GEOGRAPHY

xvii. PHYSICAL GEOGRAPHY (GEOGP101CC)

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I.	**Introduction** Definition and Scope Brief Introduction of Solar System, Origin of The Earth: Tidal Theory of Jeans and Jeffreys and Big Bang Theory Rocks: Classification and Their Characteristics	20	7	0
II.	**Lithosphere** Internal Structure of Earth, Theory of Plate Tectonics, Weathering- Definition, factors and types Fluvial Cycle of Erosion – Davis	15	6	0
III.	**Atmosphere** Structure and composition of atmosphere, Heat Balance, Pressure and wind systems, Origin of Tropical Cyclones, Monsoon, Climatic Classification (Koppen).	15	6	0
IV.	**Hydrosphere** Hydrological Cycle, Bottom Relief Features of Pacific Ocean, Tides and Currents.	15	6	0
	Total Hours	**65**	**25**	**0**

L-Lecture, T-Tutorial and P-Practical and Practices

xviii. GEOGP 202CC Environmental Geography

4. ENVIRONMENTAL GEOGRAPHY (GEOGP 202CC)

Course Code	**GEOGP 202CC**		
Credits-6	**L**	**T**	**P**
	65	**25**	**0**
Course Type	**Core**		
Lectures to be Delivered	**90**		

Note: CCA and Annual Examination scheme is same as in Paper GEOGP101CC

Course Content and Credit Scheme

L-Lecture, T-Tutorial and P-Practical and Practices

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I.	Definition and Scope of Environmental Geography Meaning and Components of Environment Ecosystem – Concept, components and Functions	17	7	0
II.	Human-Environment Relationship Environmental Determinism and Possibilism Biomes- Definition, Mountain and Desert Regions	16	6	0
III.	Environmental Problems: Air and water Pollution, Their Causes, Impacts and Management.	16	6	0

	Biodiversity Loss			
IV.	Environmental Management Initiatives in India Environmental Protection Act, 1982, Environmental Policy of India(2006), Chipko Movement	16	6	0
	Total Hours	**65**	**25**	**0**

Reading List

1. Casper J.K. (2010) Changing Ecosystems: Effects of Global Warming. Infobase Pub. New

xix. GEOGRAPHIC INFORMATION SYSTEM (GEOGP 301SEC)

GEOGRAPHIC INFORMATION SYSTEM (GEOGP 301SEC)

Course Code	**(GEOGP 301SEC)**		
Credits-4	**L**	**T**	**P**
	15	**0**	**90(45)***
Course Type	**Skill Enhancement**		
Lectures to be Delivered	**60**		

Note: The CCA and Annual Examination (Theory Paper) & Annual Practical Examination is same as in paper GEOGP204SEC

Course Content and Credit Scheme

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I.	**Introduction** Meaning and Scope of GIS, Components of GIS, History of Geographic Information System(GIS)	3	0	10(5)*
II.	**Data Types** GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure.	4	0	20(10)*
III.	**Spatial referencing system** Concept of Georeferencing, Editing and attribute data integration	4	0	30(15)*
IV.	**GIS based Exercises on** Georeferencing, Subsetting, Extraction of Land Use/Land Cover layers of any area and thematic mapping	4	0	30(20)*
	Total Hours	**15**	**0**	**90(45)***

Practical Record: The course teacher can use Survey of India toposheets/satellite images/Google images of any area of his/her choice for practical exercises. A project file

xx. GEOGP 302SEC FIELD TECHNIQUES & SURVEY BASED PROJECT REPORT

4. FIELD TECHNIQUES & SURVEY BASED PROJECT REPORT (GEOGP 302SEC)

Course Code	**(GEOGP 302SEC)**		
Credits-4	**L**	**T**	**P**
	15	0	90(45)*
Course Type	**Skill Enhancement**		
Lectures to be Delivered	60		

Note: The CCA, Annual Theory Paper and Annual Practical Examination is same as in paper GEOG204 SEC

Course Content and Credit Scheme

Unit	Topic	Allotted Time (Hrs)		
		L	T	P/FW
I.	**Introduction** Field Work in Geographical Studies – Role, Value and Ethics of Field-Work, Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental.	3	0	10(5)*
II.	**Field Techniques** Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant).	4	0	20(10)*
III.	**Questionnaires** (Open/ Closed / Structured / Non-Structured); Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch).	4	0	30(15)*
IV.	**Designing the Field Report** Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.	4	0	30(20)*
	Total Hours	**15**	**0**	**90(45)***

FW-Field Work

xxi. GEOGRAPHY OF INDIA (GEOGP 303-1DSE)

Discipline Specific Elective Papers (2 Compulsory Papers)

1. GEOGRAPHY OF INDIA (GEOGP 303-1DSE)

Course Code	(GEOGP 303-1DSE)		
Credits-6	L	T	P
	65	25	0
Course Type	Discipline Specific Elective		
Lectures to be Delivered	90		

Note: CCA and Annual Examination ESE scheme is same as in Paper GEOGP 101 CC

Course Content and Credit Scheme

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I	**Physical Setting** Location, Major physiographic region of India Climate – Factors, Characteristics, Soils of India	16	6	0
II	**Population** Size and Growth since 1901, Population Distribution and Density, Literacy, Sex Ratio	16	6	0
III	**Settlement System** Rural Settlement Types and Patterns, Urban Settlement Types and Pattern.	16	6	0
IV	**Resource Base** Power (Coal and hydroelectricity), Minerals (iron ore and bauxite). Economy – Agriculture (Rice, Wheat) Industries(Cotton Textile, Iron-Steel)	16	8	0
	Total Hours	64	26	0

L-Lecture, T-Tutorial and P-Practical and Practices

xxii. DISASTER MANAGEMENT (GEOGP 304-1DSE)

3. DISASTER MANAGEMENT (GEOGP 304-1DSE)

Course Code	GEOGP 304-1DSE)		
Credits-6	L	T	P
	65	25	0
Course Type	Discipline Specific Elective		
Lectures to be Delivered	90		

Note: CCA and Annual Examination scheme is same as in Paper GEOGP101 CC

Course Content and Credit Scheme

Unit	Topic	Allotted Time		
		L	T	P
I.	**Introduction** Definition and Concepts.: Hazards, Risk, Vulnerability and Disasters	16	6	0
II.	**Disasters in India:** Causes, Impact, Distribution: Landslide, Earthquake, and Cyclone	16	6	0
III.	**Human Induced Disasters:** Causes, Impact, Distribution: Forest Fire, Road Accidents	16	6	0
IV.	**Response and Mitigation to Disasters:** Mitigation and Preparedness, NDMA and NIDM Community Based Disaster Management Do's and Don'ts During Disasters	16	8	0
	Total Hours	64	26	0

xxiii. GEOGRAPHY OF TOURISM (GEOGP 304-2DSE)

2. GEOGRAPHY OF TOURISM (GEOGP 304-2DSE)

Course Code	(GEOGP 304-2DSE)		
Credits-6	L	T	P
	65	25	0
Course Type	Discipline Specific Elective		
Lectures to be Delivered	90		

Note: CCA and Annual Examination scheme is same as in Paper GEOGP 101 CC

Course Content and Credit Scheme

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I.	**Introduction** Concept, Nature and Scope Types of Tourism: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage	16	6	0
II.	**Recent Trends of Tourism** International and Regional; Domestic (India); Eco- Tourism, Sustainable Tourism	16	6	0
III.	**Impact of Tourism on** Environment and Society	16	6	0
IV.	**Tourism in India:** Tourism Infrastructure: A Case Study of Himachal Pradesh State Tourism Policy of Himachal Pradesh	16	8	0
	Total Hours	**64**	**26**	**0**

L-Lecture, T-Tutorial and P-Practical and Practices

Text Book(s):

Reading List

1. Dhar, P.N. (2006) International Tourism: Emerging Challenges and Future

xxiv. SUSTAINABILITY AND DEVELOPMENT (GEOGP 306-GE2)

2. SUSTAINABILITY AND DEVELOPMENT (GEOGP 306-GE2)

Course Code	(GEOGP 306-GE2)		
Credits-6	L	T	P
	65	25	0
Course Type	Generic Elective		
Lectures to be Delivered	90		

Note: CCA and Annual Examination scheme is same as in Paper GEOGP101 CC

Course Content and Credit Scheme

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I.	**Introduction** Sustainability: Concept, Components	16	7	0
II.	**The Millennium Development Goals:** National Strategies and International Experiences Sustainable Development: Need and its realization in Indian context	16	6	0
III.	**Inclusive Development:** Education, Health Role of higher education in achieving sustainability Policies and Global Cooperation for Climate Change	16	6	0
IV.	**Sustainable Development Policies and Programmes:** Rio+20, Financing for Sustainable Development; National Environmental Policy	17	6	0
	Total Hours	**65**	**25**	**0**

L-Lecture, T-Tutorial and P-Practical and Practices

Reading List

1. Agyeman, Julian, Robert D. Bullard and Bob Evans (Eds.) (2003) Just Sustainabilities:

II. GENDER

1. SANSKRIT

xxv. SANSKRIT Skt.-DSC-201 संस्कृत नाटक: अभिज्ञान शाकुंतलम

SECOND YEAR **DSC-1C** **SKT-DSC-201** **संस्कृत नाटक**	पूर्णांक : 100 (इकडोल एवं प्राईवेट विद्यार्थी) पूर्णांक: 100 (70+30) (रेगुलर विद्यार्थी) लिखित परीक्षा 70 अंक आन्तरिक मूल्याकन : 30 अंक समय : तीन घण्टे
(A) Prescribed Course:	
Section 'A'	कर्णभारम् (सम्पूर्ण)
Section 'B'	अभिज्ञानशाकुन्तलम् : चतुर्थ अंक–कालिदास
Section 'C'	संस्कृत नाट्यशास्त्रीय पारिभाषिक शब्दावली
Section 'D'	संस्कृत नाटक का इतिहास तथा प्रमुख नाटकों का परिचय
(B) Unit-wise Division:	
	Section 'A' **कर्णभारम् (सम्पूर्ण)**
Unit I	कर्णभार नाटक का परिचय, सरलार्थ, व्याख्या, काव्य सौष्ठव और कथावस्तु।
Unit II	हिन्दी व्याकरण, हिन्दी से संस्कृत में सरल अनुवाद
	Section 'B' **अभिज्ञानशाकुन्तलम् : चतुर्थ अंक (कालिदास)**
Unit I	चतुर्थ अंक (क) परिचय, नांदी, प्रस्तावना, सूत्रधार, नटी, विष्कम्भक, विदूषक और कंचुकी आदि पारिभाषिक शब्दों की व्याख्या।
Unit II	चतुर्थ अंक (ख) व्याकरण, सरलार्थ, व्याख्या, काव्य–सौष्ठव और कथावस्तु तथा घटनाक्रम का समय निर्धारण एवं प्रकृति का मानवीकरण, अभिज्ञानशाकुन्तलम् का मनोवैज्ञानिक विश्लेषण, काव्येषु नाटकं रम्यम्, उपमा कालिदासस्य उक्तियों की समीक्षा।
	Section 'C' **संस्कृत नाट्यशास्त्रीय संस्कृत पारिभाषिक शब्दावली**
Unit I	नाटक, नायक, नायिका, पूर्वरङ्ग, सूत्रधार, नेपथ्य।
Unit II	अङ्क, स्वगत, प्रकाश, अपवारित, जनान्तिक, आकाशभाषित, प्रवेशक एवं भरतवाक्य।
	Section 'D' **संस्कृत नाटक का इतिहास तथा प्रमुख नाटकों का परिचय**
Unit I	उदभव और विकास।
Unit II	प्रमुख नाटक एवं नाटककार (भास, कालिदास, शूद्रक, विशाखदत्त, हर्ष, भवभूति तथा उनकी रचनाएं।)

टिप्पणी – सभी वर्गों से प्रश्न पूछना अनिवार्य है।

2.HINDI

xxvi. HIND103 मध्यकालीन हिंदी कविता

मध्यकालीन हिंदी कविता

प्रश्न पत्र : **Core Course**
(DSC-1B)
HIND103

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 कबीर तथा सूरदास का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
1.2 कबीर तथा सूरदास की काव्यगत विशेषताएँ
पाठ्यपुस्तक - कबीर ग्रंथावली, सं0 श्यामसुन्दर दास, काशी नागरी प्रचारिणी सभा ।
1.3 कबीर की साखियाँ - गुरुदेव को अंग दोहा संख्या 3, 4
कुसंगति को अंग 6, 7
कस्तुरिया युग को अंग 4, 9
कबीर के पद - 1, 2, 15, 16
पाठ्यपुस्तक - भ्रमरगीत सार (सं0) रामचन्द्र शुक्ल
1.4 सूरदास के पद - 1, 2, 43, 44, 111, 115, 354, 355, 387, 402

इकाई - 2

2.1 तुलसीदास तथा मीरांबाई का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
2.2 तुलसीदास तथा मीरांबाई की काव्यगत विशेषताएँ
पाठ्यपुस्तक - कवितावली, गीताप्रेस गोरखपुर, सं0 2052, 36वां संस्करण
2.3 बालकाण्ड - 1
उत्तरकांड - 96, 106
विनय पत्रिका - पद संख्या - 105, 111, 162
पाठ्यपुस्तक - मीरांबाई की पदावली, सं0 आचार्य परशुराम चतुर्वेदी, हिन्दी साहित्य सम्मेलन
2.4 मीरांबाई के पद - 5, 17, 18, 19, 22, 23, 25, 41, 73, 158

इकाई - 3

3.1 रसखान तथा बिहारी का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
3.2 रसखान तथा बिहारी की काव्यगत विशेषताएँ
पाठ्यपुस्तक - रसखान रचनावली, सं0 विद्यानिवास मिश्र, सत्यदेव मिश्र, वाणी प्रकाशन, दिल्ली, सं0 1993 ।
3.3 रसखान के पद - 1, 2, 3, 4, 5, 6, 7
पाठ्यपुस्तक - बिहारी रत्नाकर, सं0 जगन्नाथ रत्नाकर प्रकाशन संस्थान, नई दिल्ली
3.4 बिहारी के दोहे - 2, 15, 20, 25, 38, 46, 69, 70, 110, 123

xxvii. HIND201 अनिवार्य हिंदी रचना पुंज

द्वितीय वर्ष

अनिवार्य हिन्दी 'रचना पुंज'

प्रश्न पत्र : **Core B.A./B.Com.**

SKT/HINDI -2 **Credits : 06**

HIND201 पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

निर्धारित पुस्तक : रचना पुंज (पद्य-गद्य-संकलन) (सं0) प्रोफ़ेसर कुमार कृष्ण, कमल प्रकाशन, बिलासपुर, हिमाचल प्रदेश, मूल्य 45 रु0 ।

इस पुस्तक में से व्याख्या तथा प्रश्नों के लिए निम्नलिखित कवि/लेखक तथा पद्यांश/गद्यांश निर्धारित हैं ।

इकाई - 1

1.1 कबीर, घनानंद, सूर्यकांत त्रिपाठी निराला तथा बालकृष्ण शर्मा नवीन का सामान्य परिचय

1.2 कबीर - पन्द्रह दोहे, घनानंद 3 कवित्त, 3 सवैये

1.3 सूर्यकांत त्रिपाठी निराला : तोड़ती पत्थर, विनय बालकृष्ण शर्मा नवीन : विप्लव गायन

इकाई - 2

2.1 सच्चिदानन्द हीरानन्द वात्स्यायन 'अज्ञेय' गजानन माधव मुक्तिबोध एवं सुदामा पाण्डे धूमिल का सामान्य परिचय

2.2 अज्ञेय : कितनी नावों में कितनी बार, दूर्वाचल
मुक्तिबोध : मुझे तुम्हारा साथ मिला है, ओ मेघ

2.3 धूमिल : दस्तक, रोटी और संसद

इकाई - 3

3.1 प्रेमचन्द, मोहन राकेश, काशीनाथ सिंह, उदय प्रकाश का सामान्य परिचय

3.2 प्रेमचन्द : ईदगाह, मोहन राकेश : मलबे का मालिक
काशीनाथ सिंह : अपना रास्ता लो बाबा, उदय प्रकाश : छप्पन तोले का करधन

इकाई - 4

4.1 महादेवी वर्मा, रामधारीसिंह दिनकर और श्रीलाल शुक्ल का सामान्य परिचय

4.2 महादेवी वर्मा : जीने की कला, रामधारी सिंह 'दिनकर' : नेता नहीं, नागरिक चाहिए, श्रीलाल शुक्ल : अंगद का पाँव

xxviii. HIND202 आधुनिक हिंदी कविता

9

आधुनिक हिंदी कविता

प्रश्न पत्र : **Core Course**
(DSC-1C)
HIND202

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 भारतेन्दु हरिश्चन्द्र तथा अयोध्या सिंह उपाध्याय 'हरिऔध' का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
1.2 भारतेन्दु हरिश्चन्द्र तथा अयोध्या सिंह उपाध्याय 'हरिऔध' की काव्यगत विशेषताएँ
1.3 भारतेन्दु हरिश्चन्द्र : कविताएँ -
- भारत दुर्दशा
- वर्षा विनोद
- प्रेम शालिका
- प्रेमाश्रु वर्षण

1.4 अयोध्या सिंह उपाध्याय 'हरिऔध' : कविताएँ -
- प्रिय प्रवास
- दुखिया के आँसू
- एक बूँद
- काँटा और फूल

इकाई - 2

2.1 मैथिलीशरण गुप्त तथा जयशंकर प्रसाद का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
2.2 मैथिलीशरण गुप्त तथा जयशंकर प्रसाद की काव्यगत विशेषताएँ
2.3 मैथिलीशरण गुप्त : कविताएँ -
- भारत भारती
- मातृभूमि
- आशा
- सन्देश

2.4 जयशंकर प्रसाद : कविताएँ -
- ले चल वहाँ भुलावा देकर
- बीती विभावरी जाग री
- अरुण यह मधुमय देश हमारा
- हृदय का सौंदर्य

इकाई – 3

3.1 सूर्यकांत त्रिपाठी निराला तथा सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' का व्यक्तित्व एवं कृतित्व : सामान्य परिचय

3.2 सूर्यकांत त्रिपाठी निराला तथा सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' की काव्यगत विशेषताएँ

3.3 सूर्यकांत त्रिपाठी निराला : कविताएँ –
वर दे, वीणा वादिनी वर दे
तोड़ती पत्थर
स्नेह निर्झर बह गया है
विधवा

3.4 सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' : कविताएँ –
उड़ चल, हारिल
कलगी बाजरे की
साँप
नया कवि : आत्म स्वीकार

इकाई – 4

4.1 नागार्जुन तथा नरेश मेहता का व्यक्तित्व एवं कृतित्व : सामान्य परिचय

4.2 नागार्जुन तथा नरेश मेहता की काव्यगत विशेषताएँ

4.3 नागार्जुन : कविताएँ –
यह दन्तुरित मुस्कान
प्रेत का बयान

4.4 नरेश मेहता : कविताएँ –
तीर्थ जल
पीले फूल कनेर के
मेघ मैं

<u>प्राश्निक के लिए निर्देश :</u>

1. प्रश्न पत्र दो भागों में विभक्त होगा । पहला भाग अनिवार्य है, जिसमें एक प्रश्न के अन्तर्गत 14 वस्तुनिष्ठ बहुविकल्पीय प्रश्न पूछे जाएंगे । वस्तुनिष्ठ प्रश्न समान रूप से चारों इकाइयों में से पूछे जाएंगे । 14 x 1 = 14 अंक(रेगुलर, आई.सी.डी.ई.ओ.एल.एवं प्राइवेट)

2. दूसरे भाग के अन्तर्गत चार प्रश्न शत-प्रतिशत विकल्प के साथ चारों इकाइयों में से पूछे जाएंगे । सभी प्रश्न अनिवार्य होंगे । प्रत्येक प्रश्न को दो उपविभागों में विभाजित किया जाएगा, जिनमें से दूसरा उपविभाग व्याख्या से सम्बन्धित रहेगा । प्रत्येक प्रश्न के लिए 7 अंक निर्धारित किए गए हैं ।

7 + 7 = 14 अंक (रेगुलर)
10¾ + 10¾ = 21½ अंक(आई.सी.डी.ई.ओ.एल.एवं प्राइवेट)

अंक विभाजन :

<u>रेगुलर</u> : 14 + 14(7+7) + 14(7+7) + 14(7+7) + 14(7+7) = 70 अंक

<u>आई.सी.डी.ई.ओ.एल.एवं प्राइवेट</u> विद्यार्थियों के लिए दूसरे भाग के अन्तर्गत प्रत्येक प्रश्न 21½ अंको का होगा । 14 + 21½ + 21½ + 21½ +21½ = 100 अंक

xxix.

xxx. HIND203 हिंदी गद्य साहित्य

11

हिंदी गद्य साहित्य

प्रश्न पत्र : **Core Course**
(DSC-1D)
HIND203

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 जैनेन्द्र कुमार : व्यक्तित्व एवं कृतित्व
1.2 उपन्यास : त्यागपत्र - पाठपरक अध्ययन
1.3 त्यागपत्र : तात्विक समीक्षा

इकाई - 2

2.1 प्रेमचंद, जयशंकर प्रसाद, यशपाल एवं उषा प्रियंवदा का व्यक्तित्व एवं कृतित्व
2.2 निम्नलिखित कहानियों का पाठपरक अध्ययन
कहानी : नमक का दरोगा - प्रेमचंद
आकाशदीप - जयशंकर प्रसाद
परदा - यशपाल
वापसी - उषा प्रियंवदा
2.3 उपर्युक्त कहानियों की तात्विक समीक्षा

इकाई - 3

3.1 रामचन्द्र शुक्ल तथा हजारीप्रसाद द्विवेदी का व्यक्तित्व एवं कृतित्व
3.2 निम्नलिखित निबन्धों का पाठपरक अध्ययन
निबन्ध : लोभ और प्रीति - रामचन्द्र शुक्ल
कुटज - हजारीप्रसाद द्विवेदी
3.3 उपर्युक्त निबन्धों की तात्विक समीक्षा

इकाई - 4

4.1 महादेवी वर्मा तथा प्रभा खेतान का व्यक्तित्व एवं कृतित्व
4.2 निम्नलिखित निबन्धों का पाठपरक अध्ययन
निबन्ध : संस्कृति और शिक्षा (चिन्तन के क्षण संग्रह से) - महादेवी वर्मा
भूमण्डलीकरण, धार्मिक समाज और पूँजीवाद - प्रभा खेतान
4.3 उपर्युक्त निबन्धों की तात्विक समीक्षा

3.ENGLISH

xxxi. B.A. I Year, DSC IA , Girl

I	**ENG DSC 102/** **ENG HONS GE 101**	**DSC-1A English Literature-1 (Essays, Stories and Poems)** **(Core Course** for students who choose English as Discipline and **Generic Elective (Interdisciplinary)** for Honours Students of other subjects) **Detailed Study:** UNIT-I i. "Deliverance" by Premchand ii. "Joothan" by Omprakash Valmiki iii. "Kallu" by Ismat Chughtai iv. "Bosom Friend" by Hira Bansode **UNIT-II** i. "Girl" by Jamaica Kincaid ii. "A Prayer for my Daughter" by W. B. Yeats iii. "Yellow Fish" by Ambai iv. "Reincarnation of Captain Cook" by Margaret Atwood **UNIT-III** i. "Blackout" by Roger Mais ii. "Telephone Conversation" by Wole Soyinka iii. "Harlem" by Langston Hughes iv. "Still I Rise" by Maya Angelou **Non-Detailed Study:** **UNIT-IV** i. "Conscientious Objector" by Edna St. Vincent Millay ii. "General, Your Tank is a Powerful Vehicle" by Bertolt Brecht	**6**

4

xxxii. A Prayer for my daughter

I	**ENG DSC 102/** **ENG HONS GE 101**	**DSC-1A English Literature-1 (Essays, Stories and Poems)** **(Core Course** for students who choose English as Discipline and **Generic Elective (Interdisciplinary)** for Honours Students of other subjects) **Detailed Study:** UNIT-I i. "Deliverance" by Premchand ii. "Joothan" by Omprakash Valmiki iii. "Kallu" by Ismat Chughtai iv. "Bosom Friend" by Hira Bansode **UNIT-II** i. "Girl" by Jamaica Kincaid ii. "A Prayer for my Daughter" by W. B. Yeats iii. "Yellow Fish" by Ambai iv. "Reincarnation of Captain Cook" by Margaret Atwood **UNIT-III** i. "Blackout" by Roger Mais ii. "Telephone Conversation" by Wole Soyinka iii. "Harlem" by Langston Hughes iv. "Still I Rise" by Maya Angelou **Non-Detailed Study:** **UNIT-IV** i. "Conscientious Objector" by Edna St. Vincent Millay ii. "General, Your Tank is a Powerful Vehicle" by Bertolt Brecht	**6**

xxxiii. Yellow Fish

I	**ENG DSC 102/** **ENG HONS GE 101**	**DSC-1A English Literature-1 (Essays, Stories and Poems)** **(Core Course** for students who choose English as Discipline and **Generic Elective (Interdisciplinary)** for Honours Students of other subjects) **Detailed Study:** UNIT-I i. "Deliverance" by Premchand ii. "Joothan" by Omprakash Valmiki iii. "Kallu" by Ismat Chughtai iv. "Bosom Friend" by Hira Bansode **UNIT-II** i. "Girl" by Jamaica Kincaid ii. "A Prayer for my Daughter" by W. B. Yeats iii. "Yellow Fish" by Ambai iv. "Reincarnation of Captain Cook" by Margaret Atwood **UNIT-III** i. "Blackout" by Roger Mais ii. "Telephone Conversation" by Wole Soyinka iii. "Harlem" by Langston Hughes iv. "Still I Rise" by Maya Angelou **Non-Detailed Study:** **UNIT-IV** i. "Conscientious Objector" by Edna St. Vincent Millay ii. "General, Your Tank is a Powerful Vehicle" by Bertolt Brecht	**6**

xxxiv. Reincarnation of Captain Cook

I	**ENG DSC 102/** **ENG HONS GE 101**	**DSC-1A English Literature-1 (Essays, Stories and Poems)** **(Core Course** for students who choose English as Discipline and **Generic Elective (Interdisciplinary)** for Honours Students of other subjects) **Detailed Study:** UNIT-I i. "Deliverance" by Premchand ii. "Joothan" by Omprakash Valmiki iii. "Kallu" by Ismat Chughtai iv. "Bosom Friend" by Hira Bansode **UNIT-II** i. "Girl" by Jamaica Kincaid ii. "A Prayer for my Daughter" by W. B. Yeats iii. "Yellow Fish" by Ambai iv. "Reincarnation of Captain Cook" by Margaret Atwood **UNIT-III** i. "Blackout" by Roger Mais ii. "Telephone Conversation" by Wole Soyinka iii. "Harlem" by Langston Hughes iv. "Still I Rise" by Maya Angelou **Non-Detailed Study:** **UNIT-IV** i. "Conscientious Objector" by Edna St. Vincent Millay ii. "General, Your Tank is a Powerful Vehicle" by Bertolt Brecht	**6**

xxxv. B.A. II Year, Compulsory English ENG CEL 201 More than 100 Million Women are Missing

Year	Paper Code	Course Name & Syllabus	Credits
II	ENG CE 201	**English-2 Core English (Compulsory)** **for B.A & B.Com.** **UNIT-I Essays** i. "The Power of Prayer" by A. P. J. Abdul Kalam ii. "Vivekananda: The Great Journey to the West" by Romain Rolland iii. "More Than 100 Million Women are Missing" by Amartya Sen iv. "On the Ignorance of the Learned" (Excerpts by William Hazlitt) v. "Simply Living" (Excerpts by Ruskin Bond). (Nos. 'i' to 'v' are from *Reflections from the East and the West* by Pankaj K. Singh and Girija Sharma. Orient Blackswan) vi. "Towards Creating a Poverty-Free World" by Muhammad Yunus (From *Gleanings from Home & Abroad.* Orient Blackswan) vii. "Climatic Change and Human Strategy" by E.K. Federov. (From *Insights: A Course in English Literature and Language* by K Elango. Orient Blackswan.) **UNIT-II Poetry.** i. "A Psalm of Life" by Henry Wadsworth Longfellow ii "Animals" by Walt Whitman iii "When I am Dead My Dearest" by Christina Rossetti iv. "If" by Rudyard Kipling v. "The Lake Isle of Innisfree" by W.B. Yeats vi. "The Olive Tree" by Mark O' Conner vii. "Refugee Mother and Child" by Chinua Achebe (From *Ripples on the Sands of Time* by Pankaj K. Singh and Girija Sharma. OUP.) **UNIT-III: Applied Grammar** 1. One Word Substitution (5 Expressions) 2. Words Used as Nouns and Verbs (5 words) (Students will be required to use the given words in sentences both as nouns and verbs)	6

4.PHYSICAL EDUCATION

xxxvi. PED 101 INTRODUCTION TO PHYSICAL EDUCATION

COURSE CONTENTS IN DETAIL

Year-I

THEORY COURSE

COURSE CODE: PED101TH **(DSC-1A)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=50+CCA=30) =80

INTRODUCTION TO PHYSICAL EDUCATION

Unit-I Introduction

1. Meaning, Definition, Need and Scope of Physical Education.
2. Aim and Objectives of Physical Education.
3. Importance of Physical Education in present era.
4. Misconceptions about Physical Education.
5. Relationship of Physical Education with General Education.
6. Physical Education as an Art and Science.

Unit-II

1. Historical Development of Physical Education in India {Pre-Independence-(Ancient India, Medieval and British Period)}.
2. Physical Education in India (Post-Independence).
3. Contribution of Akhadas, Vyayamshalas and Y.M.C.A.
4. Modern Perspectives: National Awards/State Awards and Honours, Arjuna Award, Rajiv Gandhi Khel Ratna Award, Dronacharya Award, M.A.K.A. Trophy and Parshu Ram Award.
5. Eminent Sports Personalities of different games.

Unit-III Biological Basis of Physical Education

1. Growth and Development, Differences between growth and development, Factors affecting growth and development.
2. Anatomical and Physiological Differences between Male and Female.
3. Effects of Heredity and Environment on Growth and Development.

Unit-IV Emerging Trends in Physical Education

1. Career Opportunities/Avenues in Physical Education and Sports:
   a. As a Physical Education teacher.

10

5.GEOGRAPHY

xxxvii. GEOGRAPHY OF INDIA (GEOGP 303-1DSE)

Discipline Specific Elective Papers (2 Compulsory Papers)

1. GEOGRAPHY OF INDIA (GEOGP 303-1DSE)

Course Code	**(GEOGP 303-1DSE)**		
Credits-6	**L**	**T**	**P**
	65	**25**	**0**
Course Type	**Discipline Specific Elective**		
Lectures to be Delivered	**90**		

Note: CCA and Annual Examination ESE scheme is same as in Paper GEOGP 101 CC

Course Content and Credit Scheme

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I	**Physical Setting** Location, Major physiographic region of India Climate – Factors, Characteristics, Soils of India	16	6	0
II	**Population** Size and Growth since 1901, Population Distribution and Density, Literacy, Sex Ratio	16	6	0
III	**Settlement System** Rural Settlement Types and Patterns, Urban Settlement Types and Pattern.	16	6	0
IV	**Resource Base** Power (Coal and hydroelectricity), Minerals (iron ore and bauxite). Economy – Agriculture (Rice, Wheat) Industries(Cotton Textile, Iron-Steel)	16	8	0
	Total Hours	64	26	0

L-Lecture, T-Tutorial and P-Practical and Practices

Reading List

1. Hussain M., 1992: *Geography of India*, Tata McGraw Hill Education.
2. Mamoria C. B., 1980: *Economic and Commercial Geography of India*, Shiva Lal Agarwala.
3. Miller F. P., Vandome A. F. and McBrewster J., 2009: *Geography of India: Indo- Gangetic Plain, Thar Desert, Major Rivers of India, Climate of India, Geology of India*, Alphascript Publishing.
4. Nag P. and Sengupta S., 1992: *Geography of India*, Concept Publishing.
5. Pichamuthu C. S., 1967: *Physical Geography of India*, National Book Trust.
6. Sharma T. C. and Coutinho O., 1997: *Economic and Commercial Geography of India*, Vikas Publishing.
7. Singh Gopal, 1976: *A Geography of India*, Atma Ram.
8. Spate O. H. K. and Learmonth A. T. A., 1967: *India and Pakistan: A General and Regional Geography*, Methuen.
8. Rana, Tejbir Singh, 2015, Diversity of India , R.K. Books, Delhi.

6.HISTORY

xxxviii. GE-1: HIST(A)309 Women In Indian History

7.B. A. THIRD YEAR (GE I) GE-1: IDST (A) 309

Women in Indian History

I. Theory and concepts
   a. Understanding gender and patriarchy
   b. Historiography: women's history in India

II. Women in ancient India
   a. Brahmanical and non- Brahmanical patriarchy in India
   b. Women and property

III. Women in medieval India
   a. Political processes, the harem and household
   b. Women and literary activities; Imperial women: Razia Sultan, Nur Jahan, Jahanara

IV. Women in Modem India
   a. Social reforms and women in the 19th century: social base, issues, achievements and limitations
   b. Women and Indian Nationalism: Gandhi and women's participation; programmes; limitations and constraints

III. HUMAN VALUES

8.SANSKRIT

xxxix. Skt-DSC-101 संस्कृत काव्य: रघुवंशम

FIRST YEAR DSC-1A SKT-DSC-101 संस्कृत काव्य	पूर्णांक : 100 (प्रस्वाध्याय एवं प्राइवेट विद्यार्थी) पूर्णांक : 100 (70+30) (नियमित विद्यार्थी) लिखित परीक्षा 70 अंक आन्तरिक मूल्यांकन : 30 अंक समय : तीन घण्टे
(A) Prescribed Course:	
Section 'A'	रघुवंशम्
Section 'B'	शिशुपालवधम्
Section 'C'	नीतिशतकम्
Section 'D'	संस्कृत काव्य का इतिहास
(B) Unit-Wise Division:	
	Section 'A' रघुवंशम्
Unit: I	कवि एवं काव्यपरिचय, सर्ग 1 (पद्य 1–10) सरलार्थ एवं व्याख्या, रघुवंशी राजाओं की विशेषताएं, राजा दिलीप की विशेषताएं
Unit: II	सर्ग–1 पद्य (11–25) सरलार्थ एवं व्याख्या, प्रजा की भलाई में दिलीप का योगदान। रघुवंश नामकरण की सार्थकता, प्रथम सर्ग का परिचय।
	Section 'B' शिशुपालवधम्
Unit I	कवि एवं ग्रन्थ का परिचय। शिशुपालवधं नामकरण की सार्थकता, प्रथम विषयवस्तु का परिचय। सर्ग–2 पद्य (26–37), व्याकरण, सरलार्थ, व्याख्या, काव्य–सौन्दर्य, विषयवस्तु विश्लेषण।
Unit II	सर्ग–2 पद्य (42–66), व्याकरण, सरलार्थ, काव्य–सौन्दर्य, विषयवस्तु विश्लेषण [illegible] (इन उक्तियों का विश्लेषण)।
	Section 'C' नीतिशतकम्
Unit I	पद्य 1–10, सरलार्थ, व्याख्या।
Unit II	पद्य 11–20, सरलार्थ, व्याख्या, भर्तृहरि के सामाजिक अनुभव, मूर्खों के प्रकार
	Section 'D' संस्कृत काव्य का इतिहास
Unit I	अश्वघोष, कालिदास, भारवि, माघ, श्रीहर्ष, जयदेव, भर्तृहरि तथा उनकी रचनाएँ।
Unit II	महाकाव्य और गीतिकाव्य का उद्भव और विकास, उपर्युक्त कवियों और उनकी रचनाओं के संदर्भ में।

टिप्पणी – सभी वर्गों से प्रश्न पूछना अनिवार्य है।

4

xl. Skt-DSE-301 व्यक्तित्व विकास का भारतीय दृष्टिकोण

THIRD YEAR **DSE-1A** **SKT-DSE-301** व्यक्तित्व विकास का भारतीय दृष्टिकोण	पूर्णांक : 100 (प्रश्नपत्र पूर्व अनुमोदित विश्वासी) पूर्णांक : 100 (70+30) (ऐच्छिक विश्वासी) लिखित परीक्षा 70 अंक आन्तरिक मूल्यांकन : 30 अंक समय : तीन घण्टे
(A) Prescribed Course:	
Section 'A'	ऐतिहासिक दृष्टिकोण
Section 'B'	व्यक्ति की अवधारणा
Section 'C'	व्यक्तित्व के प्रकार
Section 'D'	व्यवहार सुधार के मापदण्ड
(B) Unit Wise Division :	
	Section 'A' ऐतिहासिक दृष्टिकोण
Unit I	ऋग्वेद—1.164.37 छान्दोग्योपनिषद्—6.2.3, 6.8.6, 8.1.4 बृहदारण्यकोपनिषद्, 2, 5.18—19
	Section 'B' व्यक्ति की अवधारणा
Unit II	व्यक्ति की अवधारणा— श्रीमद्भगवद्गीता अध्याय 7 (श्लोक 1—30, जीव की अष्टधा प्रकृति)
	क्षेत्र और क्षेत्रज्ञ— श्रीमद्भगवद्गीता अध्याय—13, (श्लोक 1—2, 5—6, 19—23)क्षर और अक्षर— (अध्याय 15, श्लोक 7—11, 16—19)
	Section 'C' व्यक्तित्व के प्रकार
Unit III	व्यक्तित्व के प्रकार— श्रीमद्भगवद्गीता (अध्याय —14 श्लोक 5—14, अध्याय 17 श्लोक 2—6, 11—21)
	Section 'D' व्यवहार सुधार के मापदण्ड
Unit IV	व्यवहार सुधार के प्रकार : मन और इन्द्रियों का नियन्त्रण श्रीमद्भगवद्गीता : अध्याय 2 : 59—60, 64—68 अध्याय 3 श्लोक 41—43 अध्याय 6 श्लोक 19—23 स्वभाव आरक्षा : श्रीमद्भगवद्गीता अध्याय 9, श्लोक 3, 22—29, 30—34 स्वधर्म की पहचान — अन्तरात्मा की आवाज : श्रीमद्भगवद्गीता अध्याय 2—श्लोक 31, 41—44; अध्याय 3 श्लोक 4,5,8,9, 27—30,33—34 अध्याय 4 श्लोक 18—22

टिप्पणी — सभी वर्गों से प्रश्न पूछना अनिवार्य है।

(C) Suggested Books/Readings:	
1.	Radhakrishana, The Bhagvadgita.
2.	Gita with Hindi Translation, Gita Press, Gorakhpur.

9.COMMERCE

xli. BC 3.3 Entrepreneurship

B.Com.: Year III

Paper BC 3.3: ENTREPRENEURSHIP

Duration: 3 hrs. **Marks: 70(Regular students)** **Lectures: 65**
100 (ICDEOL students)

Objective: The course aims to orient the learner toward entrepreneurship as a career option and creative thinking and behavior.

Contents

UNIT	TOPIC	DETAILS
1	**Introduction**	Meaning, elements, determinants and importance of entrepreneurship and creative behaviour; Entrepreneurship and creative response to the society' problems and at work; Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, international entrepreneurship, netpreneurship, ecopreneurship and social entrepreneurship

49

2	**Entrepreneurship and Micro, Small and Medium Enterprises**	Concept of business groups and role of business houses and family business in India; The contemporary role models in Indian business: their values, business philosophy and behavioural orientations; Conflict in family business and its resolution
3		Public and private system of stimulation, support and sustainability of entrepreneurship. Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups, The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.
4	**Sources of business ideas and tests of feasibility**	Significance of writing the business plan/ project proposal; Contents of business plan/ project proposal; Designing business processes, location, layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered); Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions
5	**Mobilising Resources**	Mobilising resources for start-up. Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; Contract management: Basic start-up problems

10. BOTANY

xlii. BOTA 306 Medicinal Botany and Ethnobotany

Medicinal Botany and Ethnobotany

(BOTA 306)

(Credits 4) **Lectures 45**

SECTION A

Unit 1: Traditional Systems of Medicine: Brief history of use of medicinal herbs; Introduction to indigenous systems of medicines- Ayurveda, Unani and Siddha system of medicine.

(5 Lectures)

Unit 2: Ethnobotany: Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. **(5 Lectures)**

SECTION B

Unit 3: **Plants Used by the Tribals:** a) Food plants b) intoxicants and beverages c) Resins and oils and miscellaneous uses. d Sacred plants **(4 Lectures)**

Unit 4: Methodology of Ethnobotanical Studies: a) Field work b) Herbarium c) Ancient Literature d) Archaeological findings e) temples and sacred places. **(7 Lectures)**

SECTION C

Unit 5: Role of ethnobotany in modern Medicine

Medico-ethnobotanical sources in India; Significance of the following plants in ethno botanical practices (along with their habitat and morphology) a) *Azadiractha indica* b)*Ocimum sanctum* c) *Vitex negundo*. d) *Gloriosa superba* e) *Tribulus terrestris* f) *Pongamia pinnata* g) *Cassia auriculata* h) *Indigofera tinctoria*. Role of ethnobotany in modern medicine with special example *Rauvolfia sepentina, Taxus wallichiana, Trichopus zeylanicus, Artemisia, Withania*.

xliii. BOTA 305 Genetics and plant breeding

27

Discipline Specific Elective Botany

Genetics and Plant Breeding

(BOTA 305)

(Credits: Theory-4, Practical-2)

THEORY Lectures: 60

SECTION A

Unit 1: Heredity **(20 Lectures)**

Brief life history of Mendel

1. Terminologies
2. Laws of Inheritance
3. Modified Mendelian Ratios: 2:1- lethal Genes; 1:2:1- Co-dominance, incomplete dominance; 9:7; 9:4:3; 13:3; 12:3:1.
4. Chi Square
5. Pedigree Analysis
6. Cytoplasmic Inheritance: Shell Coiling in Snail, Kappa particles in Paramecium, leaf variegation in Mirabilis jalapa, Male sterility.
7. Multiple allelism
8. Pleiotropism
9. Chromosome theory of Inheritance.

SECTION B

Unit 2: Sex-determination and Sex-linked Inheritance **(4 Lectures)**

Unit 3: Linkage and Crossing over **(8 Lectures)**

Linkage: concept & history, complete & incomplete linkage, bridges experiment, coupling & repulsion, recombination frequency, linkage maps based on two and three factor crosses.
Crossing over: concept and significance, cytological proof of crossing over.

Unit 4: Mutations and Chromosomal Aberrations **(4 Lectures)**

Types of mutations, effects of physical & chemical mutagens. Numerical chromosomal changes: Euploidy, Polyploidy and Aneuploidy ; Structural chromosomal changes: Deletions, Duplications, Inversions & Translocations.

SECTION C

Unit 5: Plant Breeding **(4 lectures)**

Introduction and objectives. Breeding systems: modes of reproduction in crop plants. Important achievements and undesirable consequences of plant breeding.

Unit 6: Methods of crop improvement **(8 lectures)**

Introduction: Centres of origin and domestication of crop plants, plant genetic resources; Acclimatization; Selection methods: For self pollinated, cross pollinated and vegetatively propagated plants; Hybridization: For self, cross and vegetatively propagated plants – Procedure, advantages and limitations.

xliv. BOTA 304 Bioinformatics

Discipline Specific Elective Botany
Bioinformatics
(BOTA 304)
(Credits: Theory-4, Practicals-2)

THEORY Lectures: 60

SECTION A

Unit 1: Introduction to Bioinformatics **(5 Lectures)**

Introduction, Branches of Bioinformatics, Aims, Scope and Research areas of Bioinformatics.

Unit 2: Databases in Bioinformatics (5 Lectures)

Introduction, Biological Databases, Classification format of Biological Databases, Biological Database Retrieval System.

SECTION B

Unit 3 : Biological Sequence Databases (25 Lectures)

National Center for Biotechnology Information (NCBI): Tools and Databases of NCBI, Database Retrieval Tool, Sequence Submission to NCBI, Basic local alignment search tool (BLAST), Nucleotide Database, Protein Database, Gene Expression Database.

EMBL Nucleotide Sequence Database (EMBL-Bank): Introduction, Sequence Retrieval, Sequence Submission to EMBL, Sequence analysis tools.

DNA Data Bank of Japan (DDBJ): Introduction, Resources at DDBJ, Data Submission at DDBJ.

Protein Information Resource (PIR): About PIR, Resources of PIR, Databases of PIR, Data Retrieval in PIR.

Swiss-Prot: Introduction and Salient Features.

SECTION C

Unit 4: Sequence Alignments (10 Lectures)

Introduction, Concept of Alignment, Multiple Sequence Alignment (MSA), MSA by CLUSTALW, Scoring Matrices, Percent Accepted Mutation (PAM), Blocks of Amino Acid Substitution Matrix (BLOSUM).

Unit 5: Molecular Phylogeny (8 Lectures)

Methods of Phylogeny, Software for Phylogenetic Analyses, Consistency of Molecular Phylogenetic Prediction.

SECTION D

Unit 6: Applications of Bioinformatics(7 Lectures)

Structural Bioinformatics in Drug Discovery, Quantitative structure-activity relationship (QSAR) techniques in Drug Design, Microbial genome applications, Crop improvement.

Practical (BOTA 304)

1. Nucleic acid and protein databases.
2. Sequence retrieval from databases.
3. Sequence alignment.
4. Sequence homology and Gene annotation.
5. Construction of phylogenetic tree.

Suggested Readings

1. Ghosh Z. and Bibekanand M. (2008) Bioinformatics: Principles and Applications. Oxford University Press.
2. Pevsner J. (2009) Bioinformatics and Functional Genomics. II Edition. WileyBlackwell.
3. Campbell A. M., Heyer L. J. (2006) Discovering Genomics, Proteomics and Bioinformatics. II Edition. Benjamin Cummings.

xlv. BOTA 204 Gardening and floriculture

Gardening and Floriculture

(BOTA 204)

(Credits 4) **Lectures: 45**

SECTION A

Unit 1: Landscape Gardening and Floriculture: Definitions of Landscape Gardening and Floriculture, history of gardening, importance, status and scope of Floriculture and Landscaping; landscaping of homes, educational institutions, highways and public parks.

(6 Lectures)

Unit 2: Gardening operations: Soil laying, Manuring, Watering, Management of pests and diseases; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Mulching; Pruning, Topiary making. **(4 Lectures)**

SECTION B

Unit 3: Garden Designs, Principles, Types and Features: Principles and Elements of Garden Designs, Formal and Informal gardens, English, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Rock garden, Water garden. Some Famous gardens of India. **(7 Lectures)**

Unit 4: Propagation of Garden Plants: Sexual and vegetative methods of propagation; Role of plant growth regulators. **(5 Lectures)**

SECTION C

Unit 5: Ornamental Plants: Flowering annuals; Herbaceous perennials; Shrubs, Climbers; Ornamental trees; Ornamental bulbous plants; Palms and Cycads; Potted plants and indoor gardening; Bonsai.

(10 Lectures)

SECTION D

Unit 6: Commercial Floriculture: Factors affecting growth and flower production of ornamentals; Cultivation of Important flower crops (Carnation, Chrysanthemum, Gerbera, Gladiolus, Marigold, Rose, Lilium) **(9 Lectures)**

Unit 7. Post Harvest Management: Post- harvest handling of important flower crops, methods to prolong vase life, packaging, storage and transport of flower crops, Flower arrangements and other floral crafts.

(4 lectures)

Suggested Readings

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
3. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.
4. Hartmann and Kester, 2010. Plant Propagation: Principles and Practices. Pearson Publisher.
5. Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers.

11. HINDI

xlvi. B.A.1st. Hindi Sahitya ka Itihas (HIND102)

हिंदी साहित्य का इतिहास

प्रश्न पत्र : Core Course
(DSC-1A)
HIND102

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 काल विभाजन एवं नामकरण, आदिकालीन काव्य धाराएँ - सिद्ध, नाथ एवं जैन साहित्य
1.2 प्रमुख रासो काव्य
1.3 आदिकालीन हिन्दी साहित्य की सामान्य विशेषताएँ।

इकाई - 2

2.1 भक्ति आन्दोलन : सामाजिक-सांस्कृतिक पृष्ठभूमि
2.2 प्रमुख निर्गुण कवि, प्रमुख सगुण कवि
2.3 भक्तिकाल की सामान्य विशेषताएँ।

इकाई - 3

3.1 रीतिकाल की ऐतिहासिक पृष्ठभूमि
3.2 रीतिबद्ध
3.3 रीतिसिद्ध तथा रीतिमुक्त कवि।

इकाई - 4

4.1 1857 का स्वतंत्रता संघर्ष और हिन्दी नवजागरण, भारतेन्दु युगीन साहित्य की विशेषताएँ
4.2 महावीर प्रसाद द्विवेदी और उनका युग, द्विवेदी युग के प्रमुख गद्य लेखक और कवि
4.3 मैथिलीशरण गुप्त और राष्ट्रीय काव्यधारा
4.4 छायावाद, प्रगतिवाद, प्रयोगवाद और नई कविता एवं हिन्दी में गद्य विधाओं का उद्भव और विकास - उपन्यास, कहानी, नाटक, निबंध।

प्रायिनक के लिए निर्देश :

1. प्रश्न पत्र दो भागों में विभक्त होगा । पहला भाग अनिवार्य है, जिसमें एक प्रश्न के अन्तर्गत 14 वस्तुनिष्ठ बहुविकल्पीय प्रश्न पूछे जाएंगे । वस्तुनिष्ठ प्रश्न समान रूप से चारों इकाइयों में से पूछे जाएंगे । 14 × 1 = 14 अंकों का (आई.सी.डी.ई.ओ.एल. एवं प्राइवेट

xlvii. B.A.1st. Madhyakalin Hindi Kavita (HIND103)

मध्यकालीन हिंदी कविता

प्रश्न पत्र : Core Course
(DSC-1B)
HIND103

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 कबीर तथा सूरदास का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
1.2 कबीर तथा सूरदास की काव्यगत विशेषताएँ
पाठ्यपुस्तक - कबीर ग्रंथावली, सं0 श्यामसुन्दर दास, काशी नागरी प्रचारिणी सभा ।
1.3 कबीर की साखियाँ - गुरुदेव को अंग दीक्षा संख्या 3, 4
कुसंगति को अंग 6, 7
कस्तुरिया युग को अंग 4, 9
कबीर के पद - 1, 2, 15, 16
पाठ्यपुस्तक - भ्रमरगीत सार (सं0) रामचन्द्र शुक्ल
1.4 सूरदास के पद - 1, 2, 43, 44, 111, 115, 354, 355, 307, 402

इकाई - 2

2.1 तुलसीदास तथा मीरांबाई का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
2.2 तुलसीदास तथा मीरांबाई की काव्यगत विशेषताएँ
पाठ्यपुस्तक - कवितावली, गीताप्रेस गोरखपुर, सं0 2052, 36वां संस्करण
2.3 बालकांड - 1
उत्तरकांड - 96, 106
विनय पत्रिका - पद संख्या - 105, 111, 162
पाठ्यपुस्तक - मीरांबाई की पदावली, सं0 आचार्य परशुराम चतुर्वेदी, हिन्दी साहित्य सम्मेलन
2.4 मीरांबाई के पद - 5, 17, 18, 19, 22, 23, 25, 41, 73, 150

इकाई - 3

3.1 रसखान तथा बिहारी का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
3.2 रसखान तथा बिहारी की काव्यगत विशेषताएँ
पाठ्यपुस्तक - रसखान रचनावली, सं0 विद्यानिवास मिश्र, सत्यदेव मिश्र, वाणी प्रकाशन, दिल्ली, सं0 1993 ।
3.3 रसखान के पद - 1, 2, 3, 4, 5, 6, 7
पाठ्यपुस्तक - बिहारी रत्नाकर, सं0 जगन्नाथ रत्नाकर प्रकाशन संस्थान, नई दिल्ली
3.4 बिहारी के दोहे - 2, 15, 20, 25, 30, 46, 69, 70, 110, 123

इकाई - 4

4.1 भूषण तथा घनानंद का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
4.2 भूषण तथा घनानंद की काव्यगत विशेषताएँ
पाठ्यपुस्तक - भूषणग्रन्थावली, नागरी प्रचारिणी सभा, कांशी, सं0 2015 ।
4.3 शिवराज - भूषण - 2 से 9 तक दोहे
पाठ्यपुस्तक - घनानंद कवित्त सं0, विश्वनाथ प्रसाद मिश्र
4.4 घनानंद के छंद - 1 - 8 तक

xlviii. B.A.2nd. Aadhunik Hindi Kavita (HIND202)

आधुनिक हिंदी कविता

प्रश्न पत्र : Core Course
(DSC-1C)
HIND202

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 भारतेन्दु हरिश्चन्द्र तथा अयोध्या सिंह उपाध्याय 'हरिऔध' का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
1.2 भारतेन्दु हरिश्चन्द्र तथा अयोध्या सिंह उपाध्याय 'हरिऔध' की काव्यगत विशेषताएँ
1.3 भारतेन्दु हरिश्चन्द्र : कविताएँ -
भारत दुर्दशा
वर्षा विनोद
प्रेम मालिका
प्रेमाश्रु वर्षण
1.4 अयोध्या सिंह उपाध्याय 'हरिऔध' : कविताएँ -
प्रिय प्रवास
दुखिया के आँसू
एक बूँद
काँटा और फूल

इकाई - 2

2.1 मैथिलीशरण गुप्त तथा जयशंकर प्रसाद का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
2.2 मैथिलीशरण गुप्त तथा जयशंकर प्रसाद की काव्यगत विशेषताएँ
2.3 मैथिलीशरण गुप्त : कविताएँ -
भारत भारती
मातृभूमि
आशा
सन्देश
2.4 जयशंकर प्रसाद : कविताएँ -
ले चल वहाँ भुलावा देकर
बीती विभावरी जाग री
अरुण यह मधुमय देश हमारा
हृदय का सौंदर्य

इकाई - 3

3.1 सूर्यकांत त्रिपाठी निराला तथा सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' का व्यक्तित्व एवं कृतित्व : सामान्य परिचय

3.2 सूर्यकांत त्रिपाठी निराला तथा सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' की काव्यगत विशेषताएँ

3.3 सूर्यकांत त्रिपाठी निराला : कविताएँ -
वर दे, वीणा वादिनी वर दे
तोड़ती पत्थर
स्नेह निर्झर बह गया है
विधवा

3.4 सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' : कविताएँ -
उड़ चल, हारिल
रूलगी बाजरे की
साँप
नया कवि : आत्म स्वीकार

इकाई - 4

4.1 नागार्जुन तथा नरेश मेहता का व्यक्तित्व एवं कृतित्व : सामान्य परिचय

4.2 नागार्जुन तथा नरेश मेहता की काव्यगत विशेषताएँ

4.3 नागार्जुन : कविताएँ -
यह दन्तुरित मुस्कान
प्रेत का बयान

4.4 नरेश मेहता : कविताएँ -
तीर्थ जल
पीले फूल कनेर के
मेघ मैं

xlix. B.A.2nd. Hindi Gadya Sahitya (HIND203)

हिंदी गद्य साहित्य

प्रश्न पत्र : Core Course
(DSC-1D)
HIND203

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 जैनेन्द्र कुमार : व्यक्तित्व एवं कृतित्व

1.2 उपन्यास : त्यागपत्र - पाठपरक अध्ययन

1.3 त्यागपत्र : तात्विक समीक्षा

इकाई - 2

2.1 प्रेमचंद, जयशंकर प्रसाद, यशपाल एवं उषा प्रियंवदा का व्यक्तित्व एवं कृतित्व

2.2 निम्नलिखित कहानियों का पाठपरक अध्ययन
कहानी : नमक का दरोगा - प्रेमचंद
आकाशदीप - जयशंकर प्रसाद
परदा - यशपाल
वापसी - उषा प्रियंवदा

2.3 उपर्युक्त कहानियों की तात्विक समीक्षा

इकाई - 3

3.1 रामचन्द्र शुक्ल तथा हजारीप्रसाद द्विवेदी का व्यक्तित्व एवं कृतित्व

3.2 निम्नलिखित निबन्धों का पाठपरक अध्ययन
निबन्ध : लोभ और प्रीति - रामचन्द्र शुक्ल
कुटज - हजारीप्रसाद द्विवेदी

3.3 उपर्युक्त निबन्धों की तात्विक समीक्षा

इकाई - 4

4.1 महादेवी वर्मा तथा प्रभा खेतान का व्यक्तित्व एवं कृतित्व

4.2 निम्नलिखित निबन्धों का पाठपरक अध्ययन
निबन्ध : संस्कृति और शिक्षा (चिन्तन के क्षण संग्रह से) - महादेवी वर्मा
भूमण्डलीकरण, धार्मिक समाज और पूँजीवाद - प्रभा खेतान

4.3 उपर्युक्त निबन्धों की तात्विक समीक्षा

l. B.A.3rd Lok Sahitya (HIND305)

लोक साहित्य

प्रश्न पत्र : Discipline Specific Elective
(DSE-1A)
HIND305

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 लोक साहित्य- परिभाषा एवं स्वरूप, लोक साहित्य के विशिष्ट अध्येता, लोक संस्कृति - अवधारणा, लोक संस्कृति और साहित्य, लोक साहित्य के अध्ययन की प्रक्रिया, लोक साहित्य के संकलन की समस्याएँ।

1.2 लोक साहित्य के प्रमुख रूप- लोक गीत, लोक नाट्य, लोक कथा, लोकगाथा, लोकोक्ति।

इकाई - 2

2.1 लोकगीत - संस्कार गीत, व्रतगीत, श्रम परिहार गीत, ऋतुगीत।

2.2 लोकनाट्य - रामलीला, स्वांग, यक्षगान, भवाई, माच, तमाशा, नौटंकी, जात्रा, कथकली।

इकाई - 3

3.1 लोककथा - व्रतकथा, परीकथा, नागकथा, बोधकथा। कथानक रूढ़ियाँ एवं अभिप्राय, लोककथा निर्माण में अभिप्राय।

3.2 लोकगाथा - लोकगाथा की भारतीय परम्परा, लोकगाथा की सामान्य प्रवृत्तियाँ, लोकगाथा प्रस्तुति।

इकाई - 4

4.1 प्रसिद्ध लोकगाथाएँ - भरथरी (राजा भर्तृहरि), गुगा गाथा, गढ़ मलौग, मदना की हार, महासती सूरमी, मोहणा, नूरपुर का राजा जगत सिंह, सुन्नी चूंकू, कुंजू-चंचली, रानी सुनैना।

परिक्षक के लिए निर्देश :

li. B.A.2nd Year Compulsory Hindi HIND201

lii. B.A.3rd Chhayavadottar Hindi Kavita (HIND306)

छायावादोत्तर हिंदी कविता

प्रश्न पत्र : **Discipline Specific Elective**
(DSE-1B)
HIND306

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' तथा गजानन माधव मुक्तिबोध का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
1.2 सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' तथा गजानन माधव मुक्तिबोध की काव्यगत विशेषताएँ
1.3 सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय' : कविताएँ -
कलगी बाजरे की
यह दीप अकेला
1.4 गजानन माधव मुक्तिबोध : कविताएँ -
भूल गलती
एक रंग का राग

इकाई - 2

2.1 नागार्जुन तथा शमशेर बहादुर सिंह का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
2.2 नागार्जुन तथा शमशेर बहादुर सिंह की काव्यगत विशेषताएँ
2.3 नागार्जुन : कविताएँ -
अकाल और उसके बाद
कालिदास
2.4 शमशेर बहादुर सिंह : कविताएँ -
सूना सूना पथ है, उदास झरना
वह सलोना जिस्म

इकाई - 3

3.1 भवानी प्रसाद मिश्र तथा कुँवर नारायण का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
3.2 भवानी प्रसाद मिश्र तथा कुँवर नारायण की काव्यगत विशेषताएँ
3.3 भवानी प्रसाद मिश्र : कविताएँ -
कहीं नहीं बचे
गीत फरोश
3.4 कुँवर नारायण : कविताएँ -
नचिकेता

इकाई - 4

4.1 सर्वेश्वरदयाल सक्सेना तथा केदारनाथ सिंह का व्यक्तित्व एवं कृतित्व : सामान्य परिचय
4.2 सर्वेश्वरदयाल सक्सेना तथा केदारनाथ सिंह की काव्यगत विशेषताएँ

4.3 सर्वेश्वरदयाल सक्सेना : कविताएँ -
मैंने कब कहा
हम ले चलेंगे
4.4 केदारनाथ सिंह : कविताएँ -
रचना की आधी रात
फर्क नहीं पड़ता

liii. B.A.3rd Lok Sahitya HIND305

लोक साहित्य

प्रश्न पत्र : **Discipline Specific Elective**

(DSE-1A)
HIND305

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 लोक साहित्य- परिभाषा एवं स्वरूप, लोक साहित्य के विशिष्ट अध्येता, लोक संस्कृति - अवधारणा, लोक संस्कृति और साहित्य, लोक साहित्य के अध्ययन की प्रक्रिया, लोक साहित्य के संकलन की समस्याएँ।

1.2 लोक साहित्य के प्रमुख रूप- लोक गीत, लोक नाट्य, लोक कथा, लोकगाथा, लोकोक्ति।

इकाई - 2

2.1 लोकगीत - संस्कार गीत, व्रतगीत, श्रम परिहार गीत, ऋतुगीत।

2.2 लोकनाट्य - रामलीला, स्वांग, यक्षगान, भवाई, माच, तमाशा, नौटंकी, जात्रा, कथकली।

इकाई - 3

3.1 लोककथा - व्रतकथा, परीकथा, नागकथा, बोधकथा। कथानक रूढ़ियाँ एवं अभिप्राय, लोककथा निर्माण में अभिप्राय।

3.2 लोकगाथा - लोकगाथा की भारतीय परम्परा, लोकगाथा की सामान्य प्रवृत्तियाँ, लोकगाथा प्रस्तुति।

इकाई - 4

4.1 प्रसिद्ध लोकगाथाएँ - भरथरी (राजा भर्तृहरि), गूगा गाथा, गढ़ मलौण, मदना की हार, महासती सूरमी, मोहणा, नूरपुर का राजा जगत सिंह, सुन्नी भूंकू, कुंजू-चंचलो, रानी सुनैना।

liv. B.A.3rd GE-1 Aadhunik Bhartiya Sahitya (HIND307)

आधुनिक भारतीय साहित्य

प्रश्न पत्र : Generic Elective Course (GE-1)
HIND307

Credits : 06
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 स्वाधीनता संग्राम और भारतीय नवजागरण तथा उसका भारतीय साहित्य पर प्रभाव
1.2 भारतीय साहित्य और राष्ट्रीयता

इकाई - 2

2.1 महात्मा गांधी और महर्षि अरविंद का भारतीय साहित्य पर प्रभाव
2.2 मार्क्सवाद एवं अस्तित्ववाद का भारतीय साहित्य पर प्रभाव

इकाई - 3

3.1 अनन्तमूर्ति : संस्कार उपन्यास
3.2 रवीन्द्रनाथ टैगोर : गीतांजलि - 1. वन्दना, 2. परिचय, 3. वरदान, 4. अरुण किरण, 5. सागर में ज्वार, 6. रात्रि परीक्षा, 7. शरत् सुन्दरी, 8. आषाढ़ की संध्या, 9. दिन ढल गया, 10. प्रिय व्यथा, 11. निर्झर, 12. अखण्ड आशा, 13. प्रकाश पुण्य, 14. रक्षा बन्धन, 15. सम्मान, 16. वसन्त, 17. अकेला दीप, 18. मैं हार गई, 19. एक बार, 20. गीत-सुधा

इकाई - 4

4.1 विजय तेन्दुलकर : घासीराम कोतवाल

lv. M.A.1st.Sem. Madhyakalin kavya

समय : तीन घण्टे पूर्णांक : 100 (पत्राचार एवं प्राइवेट परीक्षार्थी)
पूर्णांक : 80 (रेगुलर परीक्षार्थी)

इस प्रश्न पत्र के अन्तर्गत व्याख्या एवं विवेचना के लिए निम्नलिखित तीन कवियों का अध्ययन किया जाएगा –

1. कबीर

पाठ्य पुस्तक : कबीर ग्रंथावली, (सं0) डॉ0 श्यामसुन्दर दास (विभिन्न अंगों से चयनित निम्नलिखित 100 साखियाँ तथा 25 पद)

साखियाँ = गुरुदेव कौ अंग (दोहा संख्या 27,34,3,4,13,17) विरह कौ अंग (3,11,12,22,38,39,40) परचा कौ अंग (3,7,13,17,23,35,39,44) चितावणी कौ अंग (1,2,4,13,18,34) माया कौ अंग (7,11,32) साँच कौ अंग (5,6,7,11) भेष कौ अंग (7,10,12,17) कुसंगति कौ अंग (2,6,7) साध कौ अंग (2,4,6) साध महिमा कौ अंग (3,7,8) बेसास कौ अंग (10,15,18,20) समुचाई कौ अंग (1,5,11,12) जीवन मूरक कौ अंग (1,2,4,5,6,9,14) गुरुसिश हैरा कौ अंग (3,5,8,13) मूरातन कौ अंग (19,21,24,26,33,34,36) काल कौ अंग (1,5,6,11,14,19,20,29,32) सजीवनी कौ अंग (2,3,4,6) अपारिष कौ अंग (1,2,3,4) पारिख कौ अंग (1,2,3) कस्तूरियाँ मृग कौ अंग (1,4,9) निधा कौ अंग (3,5,6,7,9) कुल साखियाँ = 100

पद : पद संख्या –

1,2,15,16,17,24,39,43,44,47,49,51,58,72,111,115,207,249,250,338,354,355,356,387, 402

कुल पद = 25

lvi. M.A.1st.Sem. Aadhunik Hindi Natak evam Upanyas

आधुनिक हिन्दी नाटक एवं उपन्यास समय : तीन घण्टे पूर्णांक : 100 (पत्राचार एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 80 (रेगुलर परीक्षार्थी)

इस पाठ्यक्रम के अन्तर्गत दो नाटकों तथा दो उपन्यासों का अध्ययन किया जाएगा ।

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2. आधे अधूरे : मोहन राकेश ।
3. गोदान : प्रेमचन्द ।
4. मैला आँचल : फणीश्वरनाथ रेणु ।

अंक विभाजन तथा प्राश्निक के लिए निर्देश :
चार व्याख्याएँ 4 ग 9 = 36 अंक, चार आलोचनात्मक प्रश्न 4 ग 12 = 48 अंक, आठ अति लघूत्तरी प्रश्न 2 ग 8 = 16 अंक । (पत्राचार एवं प्राईवेट परीक्षार्थी)

चार व्याख्याएँ 4 ग 8 = 32 अंक, चार आलोचनात्मक प्रश्न 4 ग 10 = 40 अंक,

lvii. M.A.2nd.Sem. Bhakti evam Riti Kavya

प्रश्न पत्र – 2

हिन्दी साहित्य का इतिहास (आदि, भक्ति एवं रीतिकाल) समय : तीन घण्टे पूर्णांक : 100 (पत्राचार एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 80 (रेगुलर परीक्षार्थी)

पाठ्य विषय

हिन्दी साहित्य : आदिकाल की पृष्ठभूमि, सिद्ध और नाथ–साहित्य, रासो–काव्य, जैन–साहित्य ।
हिन्दी साहित्य के आदिकाल का ऐतिहासिक परिदृश्य, साहित्यिक प्रवृत्तियाँ, काव्य धाराएँ, गद्य साहित्य।
प्रतिनिधि रचनाकार और उनकी रचनाएँ ।
पूर्व मध्यकाल (भक्तिकाल) की ऐतिहासिक पृष्ठभूमि, सांस्कृतिक–चेतना एवं भक्ति–आन्दोलन, विभिन्न काव्य–धाराएँ तथा उनका वैशिष्ट्य ।
प्रमुख निर्गुण सन्त कवि और उनका अवदान ।
भारत में सूफी मत का विकास तथा प्रमुख सूफी कवि और काव्यग्रन्थ, सूफी काव्य में भारतीय संस्कृति एवं लोक जीवन के तत्त्व ।
राम और कृष्ण काव्य, रामकृष्ण काव्येतर काव्य, भक्तितर काव्य प्रमुख कवि और उनका रचनागत वैशिष्ट्य ।
भक्तिकालीन गद्य–साहित्य ।
उत्तर मध्यकाल (रीतिकाल) की ऐतिहासिक पृष्ठभूमि, काल सीमा और नामकरण, दरबारी संस्कृति और लक्षण–ग्रन्थों की परंपरा, रीतिकालीन साहित्य की विभिन्न धाराएँ (रीतिबद्ध, रीतिसिद्ध), प्रवृत्तियाँ और विशेषताएँ, प्रतिनिधि रचनाकार और रचनाएँ । रीतिकालीन गद्य साहित्य ।

अंक विभाजन तथा प्राश्निक के लिए निर्देश :

निर्धारित पाठ्यक्रम में से दस आलोचनात्मक प्रश्न पूछे जाएंगे जिनमें से पाँच के उत्तर देने होंगे प्रत्येक प्रश्न के लिए 20 अंक निर्धारित हैं । (पत्राचार एवं प्राईवेट परीक्षार्थी)
5 x 16 = 80 अंक (रेगुलर परीक्षार्थी)

lviii. M.A.3rd.Sem. Aadhunik Hindi Upanyas

हिन्दी साहित्य का इतिहास (आधुनिक काल)

समय : तीन घण्टे पूर्णांक : 100 (पत्राचार एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 80 (रेगुलर परीक्षार्थी)

पाठ्य विषय

आधुनिक काल की सामाजिक, राजनीतिक, आर्थिक एवं सांस्कृतिक पृष्ठभूमि, सन् 1857 की राजक्रांति और पुनर्जागरण ।
भारतेंदु युग : प्रमुख साहित्यकार, रचनाएँ और साहित्यिक विशेषताएँ ।
द्विवेदी युग : प्रमुख साहित्यकार, रचनाएँ और साहित्यिक विशेषताएँ ।
हिन्दी स्वच्छंदतावादी चेतना का अग्रिम विकास–छायावादी काव्य : प्रमुख साहित्यकार, रचनाएँ और साहित्यिक विशेषताएँ ।
उत्तरछायावादी काव्य की विविध प्रवृत्तियाँ – प्रगतिवाद, प्रयोगवाद, नयी कविता, नवगीत, समकालीन कविता । प्रमुख साहित्यकार, रचनाएँ और साहित्यिक विशेषताएँ । हिन्दी गद्य की प्रमुख विधाओं (कहानी, उपन्यास, नाटक, निबन्ध, संस्मरण, रेखाचित्र, जीवनी, आत्मकथा, रिपोतार्ज़ आदि) का विकास ।
हिन्दी आलोचना का उद्भव और विकास ।

lix. M.A.4th.Samkalin Hindi Upanyas

पाठ्य विषय

उपन्यास का स्वरूप, हिन्दी उपन्यास का इतिहास, हिन्दी उपन्यास की प्रमुख शैलियाँ, हिन्दी के प्रतिनिधि उपन्यासकारों का वस्तुशिल्पगत वैशिष्ट्य ।

व्याख्या एवं विवेचना के लिए निम्नलिखित तीन उपन्यासों का विद्यार्थी अध्ययन करेंगे –

1. रंगभूमि – प्रेमचन्द
2. मृगनयनी – वृन्दावन लाल वर्मा ।
3. बलचनमा – नागार्जुन ।

12. POLITICAL SCIENCE

lx. BA III Yr Human Right Gender and Environment

B.A. Political Science Syllabus (Regular)
BA-III Year (Annual System)
Generic Elective-2 Generic-2
Code: GE-2-POLS306
Human Rights, Gender and Environment

Course Code	GE-2-POLS306	
Credits-6	L =Lecture	T= Tutorial
	L= 5	T =1
Course Type	GE	

Term End Examination System

Maximum Marks	Minimum Pass Marks	Total Maximum aggregate marks Annual exam + CCA/IA	Minimum Aggregate Pass marks in Percentage Annual exam +CCA/IA	Time Allowed
70	25	100	40%	3.00 Hrs.

Continuous Comprehensive Assessment CCA/IA Pattern

Attendance	Class Test	House Test	Assignment/Seminar/Class Test/Tutorial/Quiz etc.	Total Maximum marks CCA/IA	Minimum Pass Marks	Total maximum aggregate marks	Minimum aggregate pass marks in percentage annual examination + CCA/IA
5	5	10	10	30	11	100	40%

Course Content

Unit	Topic
I	Human Rights: Meanings and Scope. UN Declarations and Covenants.
II	Human Rights in India: Constitutional Provisions and Practices. The Role of National Human Rights Commission (NHRC).
III	Analyzing Structures of Patriarchy. Economic Development and Women. The Issue of Women Political Participation and Representation in India.
IV	Environmental and Sustainable Development. UN Environment Programme: Rio, Johannesburg and after. Environmental Policy in India.

13. CHEMISTRY

lxi. CHEM307 CHEMICAL TECHNOLOGY & SOCIETY AND BUSINESS SKILLS FOR CHEMISTRY

CHEM 307
CHEMICAL TECHNOLOGY & SOCIETY and BUSINESS SKILLS FOR CHEMISTRY

Max. Marks: 70 **Time allowed: 03 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of 15 marks each and may contain more than one part. Section E will be of 10 marks and consists of 10 objective type questions (in MCQ/true and false / fill in the blanks) of one mark each covering the entire syllabus of the paper.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION-A

Chemical Technology

Basic principles of distillation, solvent extraction, solid-liquid leaching and liquid-liquid extraction, separation by absorption and adsorption. An introduction into the scope of different types of equipment needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology. (18 Hours)

SECTION-B

Society

Exploration of societal and technological issues from a chemical perspective. Chemical and scientific literacy as a means to better understand topics like air and water (and the trace materials found in them that are referred to as pollutants); energy from natural sources (i.e. solar and renewable forms), from fossil fuels and from nuclear fission; materials like plastics and polymers and their natural analogues, proteins and nucleic acids, and molecular reactivity and interconversions from simple examples like combustion to complex instances like genetic engineering and the manufacture of drugs. (18 Hours)

Section - C

14. ENGLISH

lxii. "B.A. I Year, Compulsory English ENG CEL 101

First Year

Year	Paper Code	Course Name & Syllabus	Credits
I	ENG CE 101	**English-1 Core English (Compulsory) for B.A. and B.Com.** **UNIT-I** i. "Ozymandias" ii. "Blow Blow thou Winter Wind" iii. "Good Morrow" iv. "The Man he Killed" v. "Lines Written in Early Spring" **Poems** from *The Blossoming Mind.* Ed. V. K. Khanna and Meenakshi F. Paul. New Delhi: Macmillan. **UNIT-II** i. "The Parrot in the Cage" ii. "Dinner for the Boss" iii. "The Reddening Tree" iv. "At the Himalayas" v. "The Value of Silence" **Stories** and **Essays** from *Life Unfolded.* Ed. V. K. Khanna and Meenakshi F. Paul. New Delhi: Oxford	6

lxiii. "B.A. II Year, Compulsory English ENG CEL 201

Second Year

Year	Paper Code	Course Name & Syllabus	Credits
II	ENG CE 201	**English-2 Core English (Compulsory) for B.A & B.Com.** **UNIT-I Essays** i. "The Power of Prayer" by A. P. J. Abdul Kalam ii. "Vivekananda: The Great Journey to the West" by Romain Rolland iii. "More Than 100 Million Women are Missing" by Amartya Sen iv. "On the Ignorance of the Learned" (Excerpts by William Hazlitt) v. "Simply Living" (Excerpts by Ruskin Bond). (Nos. 'i' to 'v' are from *Reflections from the East and the West* by Pankaj K. Singh and Girija Sharma. Orient	6

15. PHYSICAL EDUCATION

lxiv. PED 101 INTRODUCTION TO PHYSICAL EDUCATION

COURSE CONTENTS IN DETAIL

Year-I

THEORY COURSE

COURSE CODE: PED101TH **(DSC-1A)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=50+CCA=30) =80

INTRODUCTION TO PHYSICAL EDUCATION

Unit-I Introduction

1. Meaning, Definition, Need and Scope of Physical Education.
2. Aim and Objectives of Physical Education.
3. Importance of Physical Education in present era.
4. Misconceptions about Physical Education.
5. Relationship of Physical Education with General Education.
6. Physical Education as an Art and Science.

lxv. PED102 OLYMPIC MOVEMENT AND ORGANIZATION OF TOURNAMENTS

Year-I

THEORY COURSE

COURSE CODE: PED102TH **(DSC-1B)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=50+CCA=30) =80

OLYMPIC MOVEMENT AND ORGANIZATION OF TOURNAMENTS

Unit-I Olympics Games, Asian Games and Commonwealth Games

1. Olympic Movement: Ancient and Modern Olympics Games.
2. Importance of Olympic Games, Objectives of Olympic, Olympic Motto, Emblem, Flag, Olympic Torch and Awards, Opening and Closing Ceremonies.
3. Asian Games: Historical background of Asian Games.
4. Performance of India at Olympic Games, World Championship, Asian Games, SAF and Commonwealth Games.

Unit-II Promotion of Physical Education and Sports in India

1. Promotion of Physical Education and Sports: Policies, Schemes.
2. Role of IOA, SAI, NSNIS and Khelo Bharat Abhiyan in the development of Physical Education and Sports in India.
3. Causes of deterioration of Sports Performance.
4. Indian National Sports Policy and Sports Policy of Himachal Pradesh.

Unit-III Intramurals and Extramurals

1 Intramurals :

i) Its importance and planning.

ii) Events of competitions, time and facility factor.

2. Extramurals :

ii) Planning and conduct.

iii) Outcomes of participations (Educational).

iv) Limitations in participations.

v) Selection and training of teams.

vi) Participation, finance and other aspects.

Unit-IV Organisation of Tournaments

1. Concept and definition of tournament.

lxvi. PED203 SPORTS MEDICINE, PHYSIOTHERAPY AND REHABILITATION

Year-II

THEORY COURSE

COURSE CODE: PED203TH **(SEC-1)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=70+CCA=30) =100

SPORTS MEDICINE, PHYSIOTHERAPY AND REHABILITATION

Unit-I Sports Medicine

1. Sports Medicine: Meaning, definition, aims, objectives, modern concepts and importance.
2. Injuries: Type of sports injuries, prevention of injuries in sports, common sports injuries and their diagnosis.
3. First Aid: Meaning, objectives and precautionary measures while giving first aid and PRICE.
4. Treatment of Laceration, Blisters, Contusion, Strain, Sprain, Fracture, Dislocation and Cramps.

Unit-II Common Accidents and Ergogenic Aids

1. Emergency treatment for common accidents: Drowning, Burning, Insect stings & bitings, Snake bite, Dog bite, Poisoning, Unconsciousness, Fainting, Hysteria, Sunstroke, Shock, Electric shock and Acid burn.
2. Doping: Meaning and Definition.
   a. NADA (An Introduction).
   b. WADA (An Introduction).
   c. Aims and Objectives of NADA and WADA.
3. Ergogenic aids in sports and their ill effects :
   a. Anabolic agents
   b. Stimulants
   c. Beta blockers
   d. Narcotic analgesics
   e. Diuretics

lxvii. PED 202 SPORTS PSYCHOLOGY

Year-II

THEORY COURSE

COURSE CODE: PED202TH **(DSC-1D)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=50+CCA=30) =80

SPORTS PSYCHOLOGY

Unit-I Introduction

1. Meaning of psychology and sports psychology.
2. Definition, scope and importance of sports psychology.
3. Goals of sports psychology.
4. Psychological factors affecting sports performance.

Unit-II Growth and Development

1. Concept of growth and development.
2. Physical, mental, social, intellectual and emotional development in infancy, later childhood and adolescence stages.
3. Learning: meaning, definition and nature of learning.
4. Laws of learning and learning curve.
5. Theories of learning.

Unit-III Motivation

1. Meaning and definition of motivation.
2. Types of motivation and motivation in learning.
3. Individual differences its type and nature.
4. Determinants of individual difference:
    a. Heredity (Nature).
    b. Environment (Nurture).
5. Intelligence, its meaning and types.

Unit-IV Personality

1. Personality: Meaning of personality, definition and personality characteristics.

lxviii. PED204TH SPORTS TRAINING

Year-II

THEORY COURSE

COURSE CODE: PED204TH **(SEC-2)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=70+CCA=30) =100

SPORTS TRAINING

Unit-I

1. Sports Training: Introduction, Meaning and Definition of Sports Training.
2. Aim and Objectives of Sports Training.
3. Principles of Sports Training, System of Sports Training.
4. Basic Performance, Good Performance and High Performance Training.

Unit-II

1. Concept of warming-up and cooling down.
2. Physiological basis of warming-up and cooling down.
3. Training Components: Speed, Strength, Endurance, Flexibility and Co-ordinative Abilities.
4. Types and methods for the development of training components.

lxix. PED 305 RECREATION

Year-III

THEORY COURSE

COURSE CODE: PED305TH **(DSE-1A)**

Credits: 6 **(L=65+T=25+P=0) =90**

Marks: (ETE=70+CCA=30) =100

RECREATION

Unit-I

1. Meaning of Recreation, aims and objectives of Recreation.
2. Physical education and recreation.
3. Need and importance of recreation in modern age.
4. Arrangement of recreation centres.

Unit-II

1. Concept and meaning of camp, aims and objectives of camp.
2. Types of camp.
3. Agencies promoting camp.
4. Educative value of camp.

Unit-III

1. Types and nature of recreation.
2. Recreation providing agencies and recent changes in the recreational activities

3. Responsibilities of a recreational manager.

Unit-IV

1. Meaning, importance and utilities of picnic.
2. Organization of picnic and essentials for picnic and factors affecting its organization.
3. Educative value of picnic.
4. Recreational and Adventurous Avenues in Himachal Pradesh (Water Games, Paragliding, Winter Games, Mountaineering and Trekking).

References:

1. Organisation and Administration & Recreation in Physical Education, Tandon Publication: Ludhiana.
2. Administration of Physical Education and Athletics Program. Charles, A. Bucher.
3. Butter,George. Introduction to Community Recreation, McGraw Hill Book Company Inc, New York. 3rd edition, 1959.

lxx. PED 309 HEALTH EDUCATION AND NUTRITION

THEORY COURSE

COURSE CODE: PED309TH **(GE-1)**

Credits: 6 **(L=65+T=25+P=0) =90**

Marks: (ETE=70+CCA=30) =100

HEALTH EDUCATION AND NUTRITION

Unit-I Introduction

1. Concept of health, meaning, definition and scope of heath education.
2. Objective of health education.
3. Principles of heath education.
4. Need and significance of health education.

Unit-II Personal Health and Hygiene

1. Meaning of personal hygiene.
2. Personal care of:
    a. Skin.
    b. Hair.
    c. Ear.
    d. Eyes.
    e. Nose.
    f. Teeth.
    g. Feet.
    h. Cloths.
3. Eliminating of body wastes.
4. Rest, sleep and relaxation.
5. Effect of alcohol and smoking on health.

16. GEOGRAPHY

lxxi. ENVIRONMENTAL GEOGRAPHY (GEOGP 202CC)

4. ENVIRONMENTAL GEOGRAPHY (GEOGP 202CC)

Course Code	GEOGP 202CC		
Credits-6	L	T	P
	65	25	0
Course Type	Core		
Lectures to be Delivered	90		

Note: CCA and Annual Examination scheme is same as in Paper GEOGP101CC

Course Content and Credit Scheme

L-Lecture, T-Tutorial and P-Practical and Practices

Unit	Topic	Allotted Time (Hours)		
		L	T	P
I.	Definition and Scope of Environmental Geography Meaning and Components of Environment Ecosystem – Concept, components and Functions	17	7	0
II.	Human-Environment Relationship Environmental Determinism and Possibilism Biomes- Definition, Mountain and Desert Regions	16	6	0
III.	Environmental Problems: Air and water Pollution, Their Causes, Impacts and Management. Biodiversity Loss	16	6	0
IV.	Environmental Management Initiatives in India Environmental Protection Act, 1982, Environmental Policy of India(2006), Chipko Movement	16	6	0
	Total Hours	**65**	**25**	**0**

IV. PROFESSIONAL ETHICS

17. COMMERCE

lxxii. BC 1.2: BUSINESS ORGANISATION AND MANAGEMENT

B.Com.: Year I

Paper BC 1.2: BUSINESS ORGANISATION AND MANAGEMENT

Duration: 3 hrs. **Marks: 70(Regular students)** **Lectures: 65**
100 (ICDEOL students)

Objective: The course aims to provide basic knowledge to the students about the organization and management of a business enterprise.

Contents

UNIT	TOPIC	DETAILS
1	Foundation of Indian Business	Manufacturing and service sectors; Small and medium enterprises; Problems and government policy. India's experience of liberalisation and globalisation. Technological innovations and skill development. 'Make in India' Movement. Corporate Social responsibility and ethics Emerging opportunities in business; Franchising, Outsourcing, and E-commerce.
2	Business Enterprises	Forms of Business Organisation: Sole Proprietorship, Joint Hindu Family Firm, Partnership firm, Joint Stock Company, Cooperative society; Limited Liability Partnership; Choice of Form of Organisation. Government - Business Interface; Rationale and Forms of Public Enterprises. International Business. Multinational Corporations.
3	Management and Organisation	The Process of Management: Planning; Decision-making; Strategy Formulation. Indian Philosophy of Management: The Gita and Management, Gandhian Philosophy. Organizing: Basic Considerations; Departmentation – Functional, Project, Matrix and Network; Delegation and Decentralisation of Authority; Groups and Teams.
4	Leadership, Motivation and	Leadership: Concept and Styles; Trait and Situational Theory of Leadership.

lxxiii. BC 3.1(c): CORPORATE GOVERNANCE AND AUDITING

Paper BC 3.1(c): CORPORATE GOVERNANCE AND AUDITING

Duration: 3 hrs. **Marks: 70(Regular students)** **Lectures: 65**
100 (ICDEOL students)

Objective: The course aims to provide knowledge of Corporate Governance, Business Ethics and Corporate Social Responsibility principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of auditing.

Contents

UNIT	TOPIC	DETAILS
1	Corporate Governance	Evolution of Corporate Governance; Developments in India, Regulatory Framework of Corporate Governance in India, SEBI Guidelines on Corporate Governance; Reforms in Companies Act, Clause 49 and Listing Agreement. Corporate management vs. Governance; Internal constituents of the Corporate Governance.

41

		Theories & Models, Broad Committees; Major Corporate Scandals in India and Abroad- Relevant case Studies; Common Governance Problems Noticed in various Corporate Failures. Codes & Standards on Corporate Governance.
2	**Business Ethics**	Introduction to Business Ethics: The concept, nature and growing significance of Ethics in Business, Ethical principles in Business, Ethics in Management, Theories of Business Ethics. Codes of ethics, ethics committee Morality and ethics, business values and ethics. Ethical Issues in Business: Ethics in various Functional Areas of Business: Ethics in Finance, Ethics in HRM, Ethics in Marketing, Environmental Ethics.
3	**Corporate Social Responsibility (CSR)**	Concept of CSR, Corporate Philanthropy, CSR and Corporate Sustainability; CSR and Business Ethics, CSR provisions under the Companies Act 2013; CSR Committee; CSR Models, Codes, and Standards on CSR. Rating Agencies; Green Governance; Concept of Whistle blower.
4	**Introduction to Auditing**	Introduction, Meaning, Objectives, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure – Vouching and verification of Assets & Liabilities

18. BOTANY

lxxiv. BOTA 304 Bioinformatics

San Francisco.

Discipline Specific Elective Botany

Bioinformatics

(BOTA 304)

(Credits: Theory-4, Practicals-2)

THEORY Lectures: 60

SECTION A

Unit 1: Introduction to Bioinformatics (5 Lectures)

Introduction, Branches of Bioinformatics, Aim, Scope and Research areas of Bioinformatics.

Unit 2 : Databases in Bioinformatics (5 Lectures)

Introduction, Biological Databases, Classification format of Biological Databases, Biological Database Retrieval System.

SECTION B

Unit 3 : Biological Sequence Databases (25 Lectures)

National Center for Biotechnology Information (NCBI): Tools and Databases of NCBI, Database Retrieval Tool, Sequence Submission to NCBI, Basic local alignment search tool (BLAST), Nucleotide Database, Protein Database, Gene Expression Database.

EMBL Nucleotide Sequence Database (EMBL-Bank): Introduction, Sequence Retrieval, Sequence Submission to EMBL, Sequence analysis tools.

DNA Data Bank of Japan (DDBJ): Introduction, Resources at DDBJ, Data Submission at DDBJ.

Protein Information Resource (PIR): About PIR, Resources of PIR, Databases of PIR, Data Retrieval in PIR.

lxxv. BOTA 306 Medicinal Botany and ethnobotany

33

Medicinal Botany and Ethnobotany

(BOTA 306)

(Credits 4) Lectures 45

SECTION A

Unit 1: Traditional Systems of Medicine: Brief history of use of medicinal herbs; Introduction to indigenous systems of medicines- Ayurveda, Unani and Siddha system of medicine.

(5 Lectures)

Unit 2: Ethnobotany: Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science, The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. (5 Lectures)

SECTION B

Unit 3: **Plants Used by the Tribals:** a) Food plants b) intoxicants and beverages c) Resins and oils and miscellaneous uses. d Sacred plants (4 Lectures)

Unit 4: Methodology of Ethnobotanical Studies: a) Field work b) Herbarium c) Ancient Literature d) Archaeological findings e) temples and sacred places. (7 Lectures)

SECTION C

Unit 5: Role of ethnobotany in modern Medicine

Medico-ethnobotanical sources in India: Significance of the following plants in ethno botanical practices (along with their habitat and morphology) a) *Azadiractha indica* b)*Ocimum sanctum* c) *Vitex negundo*. d) *Gloriosa superba* e) *Tribulus terrestris* f) *Pongamia pinnata* g) *Cassia auriculata* h) *Indigofera tinctoria*. Role of ethnobotany in modern medicine with special example *Rauvolfia sepentina, Taxus wallichiana, Trichopus zeylanicus, Artemisia, Withania*.

(13 Lectures)

19. HINDI

lxxvi. B.A.2nd SEC-1 Karyalayi Hindi (HIND 204)

कार्यालयी हिन्दी

प्रश्न पत्र : **Skill Enhancement Course**
(SEC-1)
HIND204

Credits : 04
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 हिन्दी भाषा के विभिन्न रूप-राष्ट्रभाषा, राजभाषा, जनभाषा।
1.2 शिक्षण माध्यम-भाषा, संचार भाषा, सर्जनात्मक भाषा, यांत्रिक भाषा।

इकाई - 2

2.1 राजभाषा का स्वरूप, भारतीय संविधान में राजभाषा संबंधी परिनियमावली का सामान्य परिचय
2.2 राजभाषा के रूप में हिन्दी के समक्ष व्यावहारिक कठिनाइयाँ एवं संभावित समाधान।

इकाई - 3

3.1 टिप्पण (नोटिंग), प्रारूपण/आलेखन (ड्राफ्टिंग), पल्लवन, संक्षेपण।
3.2 विभिन्न प्रकार के पत्राचार, प्रशासनिक पत्रावली की निष्पादन प्रक्रिया।

इकाई - 4

4.1 पारिभाषिक शब्दावली।
4.2 कार्यालयी प्रयोजनों में विभिन्न यांत्रिक उपकरणों का अनुप्रयोग - कम्प्यूटर, लैपटॉप, टैबलेट, टेलीप्रिंटर, टेलेक्स, वीडियो कान्फ्रेंसिंग।

lxxvii. B.A.2nd SEC-2 Anuvaad Vigyan (HIND206)

अनुवाद विज्ञान

प्रश्न पत्र : **Skill Enhancement Course**

(SEC-2) **Credits : 04**

HIND206 पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

इकाई - 1

1.1 अनुवाद का तात्पर्य, अनुवाद के विभिन्न प्रकार - भाषान्तरण, सारानुवाद तथा रूपान्तरण में साम्य-वैषम्य। अनुवाद के प्रमुख प्रकार-कार्यालयी, साहित्यिक, ज्ञान-विज्ञानपरक, विधिक, वाणिज्यिक।

1.2 अनुवाद के शिल्पगत भेद अविकल अनुवाद (लिटरल), भावानुवाद/छायानुवाद, आशु अनुवाद, डबिंग, कम्प्यूटर अनुवाद।

इकाई - 2

2.1 साहित्यिक अनुवाद के प्रमुख रूप-काव्यानुवाद, कथानुवाद, नाट्यानुवाद।

2.2 अनुवाद में पर्यवेक्षण (वेटिंग) की भूमिका।

इकाई - 3

3.1 वैज्ञानिक तकनीकी शब्दावली का अनुवाद, मुहावरों/लोकोक्तियों का अनुवाद, संक्षिप्ताक्षरों तथा कूटपदों का अनुवाद, आंचलिक शब्दावली का अनुवाद, व्यंजनापरक लाक्षणिक पद प्रयोगों का अनुवाद।

3.2 अनुवाद की सम्पादन प्रविधि।

3.3 अनुवादक की अर्हता और सफल अनुवाद के अभिलक्षण।

इकाई - 4

4.1 विश्व भाषाओं की प्रमुख कृतियों के हिन्दी अनुवाद एवं हिन्दी की प्रमुख कृतियों के विश्वभाषाओं में किये गये अनुवाद।

4.2 भारत में अनुवाद प्रशिक्षण के प्रमुख केन्द्र, अनुवाद के राष्ट्रीय प्राधिकरण के गठन की आवश्यकता।

4.3 हिन्दी अनुवाद का भविष्य।

lxxviii. HIND205 हिंदी भाषा शिक्षण

हिंदी भाषा शिक्षण

प्रश्न पत्र : **Skill Enhancement Course**
(SEC-1)
HIND205

Credits : 04
पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)
पूर्णांक : 70 (रेगुलर परीक्षार्थी)
आन्तरिक मूल्यांकन : 30
समय : तीन घण्टे

इकाई - 1

1.1 भाषा शिक्षण के संदर्भ : राष्ट्रीय, सामाजिक, शैक्षिक और भाषिक।

1.2 भाषा शिक्षण की आधारभूत संकल्पनाएँ
- प्रथम भाषा/मातृभाषा तथा अन्य भाषा की संकल्पना
- अन्य भाषा के अंतर्गत द्वितीय तथा विदेशी भाषा की संकल्पना
- मातृभाषा, द्वितीय भाषा और विदेशी भाषा के शिक्षण में अंतर
- सामान्य और विशिष्ट प्रयोजन के लिए भाषा-शिक्षण

इकाई - 2

2.1 भाषा शिक्षण की विधियाँ
- भाषा कौशल - श्रवण, भाषण, वाचन, लेखन।
- भाषा का कौशल के रूप में शिक्षण; भाषा कौशलों के विकास की तकनीक और अभ्यास
- अन्य भाषा-शिक्षण की प्रमुख विधियाँ : व्याकरण-अनुवाद-विधि, प्रत्यक्ष विधि, मौखिक वार्तालाप विधि, संरचनात्मक विधि, द्विभाषिक शिक्षण विधि।

इकाई - 3

3.1 हिंदी शिक्षण
- हिंदी का मातृभाषा के रूप में शिक्षण : स्कूली शिक्षा, उच्च शिक्षा, दूरस्थ शिक्षा, तकनीकी तथा विशिष्ट प्रयोजन संदर्भित शिक्षा।
- द्वितीय भाषा के रूप में सजातीय और विजातीय भाषा वर्गों के संदर्भ में हिंदी शिक्षण
- विदेशी भाषा के रूप में विदेशों में हिंदी शिक्षण

इकाई - 4

4.1 भाषा परीक्षण और मूल्यांकन
- भाषा परीक्षण और मूल्यांकन की संकल्पना
- भाषा-परीक्षण के प्रकार
- मूल्यांकन के प्रकार

lxxix. B.A.2nd SEC-2 Sambhashan Kala (HIND207)

संभाषण कला

प्रश्न पत्र : **Skill Enhancement Course**

(SEC-2)

HIND207

Credits : 04

पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

इकाई - 1

1.1 संभाषण का अर्थ।

1.2 संभाषण के विभिन्न रूप-वार्तालाप, व्याख्यान, वाद विवाद, एकालाप, अवाचिक अभिव्यक्ति, जन संबोधन।

1.3 जन सम्पर्क में वाक्कला की उपयोगिता

इकाई - 2

2.1 संभाषण कला के प्रमुख उपादान - यथेष्ट भाषा ज्ञान, मानक उच्चारण, सटीक प्रस्तुति, अन्तराल ध्वनि (वाल्यूम), वेग, लहजा (एक्सेण्ट)

2.2 संभाषण कला के विभिन्न रूप, उद्घोषणा कला (अनाउन्समेंट), आंखों देखा हाल (कमेन्ट्री), संचालन (एंकरिंग)

2.3 वाचन कला, समाचार वाचन (रेडियो, टीवी.) मंचीय वाचन (कविता, कहानी, व्यंग्य आदि)

इकाई - 3

3.1 वाद-विवाद प्रतियोगिता एवं समूह संवाद।

3.2 लोक प्रशासन, जनसम्पर्क एवं विपणन के विकास में संभाषण कला का योगदान।

इकाई - 4

4.1 संवादी भाषा (कनवर्सेशनल लैंग्वेज) के रूप में हिन्दी की भाषिक संवेदना की विवेचना।

पाठ्यक्रम के लिए निर्देश :

lxxx. B.A.3rd.SEC-3 Rang aalekh evam Rangmanch (HIND301)

तृतीय वर्ष

रंग आलेख एवं रंगमंच

प्रश्न पत्र : **Skill Enhancement Course**

(SEC-3)

HIND301

Credits : 04

पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

इकाई - 1

1.1 नाटक के प्रमुख प्रकार और उनका रचना विधान-पूर्णांकी, एकांकी, लोकनाटक, प्रहसन, काव्यनाटक, नुक्कड़ नाटक, प्रतीकनाटक, भावनाटक, पाठ्यनाटक, रेडियो नाटक, टीवी नाटक।

इकाई - 2

2.1 हिन्दी नाट्यशास्त्र और नाट्य लेखन का इतिहास

2.2 हिन्दी नाटक की प्रमुख प्रवृत्तियाँ - सामाजिक, सांस्कृतिक, ऐतिहासिक, समस्यामूलक तथा एबसर्ड नाटक।

इकाई - 3

3.1 हिन्दी के प्रमुख नाटक और नाटककार।

3.2 हिन्दी रंगमंच के प्रमुख रूप-1. शौकिया मंच 2. व्यावसायिक मंच 3. सरकारी मंच।

3.3 हिन्दी क्षेत्र की प्रसिद्ध रंगशालाएं तथा संस्थाएं।

इकाई - 4

4.1 रंग शिल्प प्रशिक्षण, रंग स्थापत्य, रंग सज्जा, रंग दीपन, ध्वनि व्यवस्था एवं प्रसाधन, निर्देशन एवं अभिनय। रंगमंचीय भाषा की विशेषताएं।

4.2 रंग आलेख की प्रविधि - वस्तुविधान, पात्र परिकल्पना, परिस्थिति योजना, संवाद लेखन का वैशिष्ट्य, रंग निर्देशों की उपयोगिता।

4.3 रंग समीक्षा का महत्त्व।

प्राश्निक के लिए निर्देश :

1. प्रश्न पत्र दो भागों में विभक्त होगा । पहला भाग अनिवार्य है, जिसमें एक प्रश्न के अन्तर्गत 14 वस्तुनिष्ठ बहुविकल्पीय प्रश्न पूछे जाएंगे । वस्तुनिष्ठ प्रश्न समान रूप से चारों इकाइयों में से पूछे जाएंगे । 14 x 1 = 14 अंक(रेगुलर, आई.सी.डी.ई.ओ.एल.एवं प्राइवेट)
2. दूसरे भाग के अन्तर्गत चार प्रश्न शत-प्रतिशत विकल्प के साथ चारों इकाइयों में से पूछे जाएंगे । सभी प्रश्न अनिवार्य होंगे । प्रत्येक प्रश्न को दो उपविभागों में विभाजित किया जाएगा, जिनमें प्रत्येक प्रश्न के लिए 7 अंक निर्धारित किए गए हैं ।

7 + 7 = 14 अंक (रेगुलर)

lxxxi. HIND302 भाषा कंप्यूटिंग

भाषा कम्प्यूटिंग

प्रश्न पत्र : **Skill Enhancement Course**

(SEC-3) **Credits : 04**

HIND302 पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

इकाई - 1

1.1 कम्प्यूटर प्रबंधन-हार्डवेयर, सॉफ्टवेयर, प्रमुख एप्लीकेशन पैकेज, वेबसाइट, ई-मेल, वेब सर्फिंग।

1.2 इलेक्ट्रॉनिक मीडिया, सी.डी.,मोबाइल और किंडल, मैग्जीन का निर्माण।

इकाई - 2

2.1 मल्टीमीडिया की कार्य प्रणाली।

2.2 कम्प्यूटर में डाटा प्रविष्टि, स्मृति (मेमोरी), सूचना संग्रहण।

2.3 कम्प्यूटर मुद्रण।

इकाई - 3

3.1 सूचना प्रौद्योगिकी का स्वरूप।

3.2 संचार प्रौद्योगिकी की प्रयोजनीय शब्दावली।

3.3 संचार भाषा के रूप में हिन्दी की उपलब्धियाँ।

इकाई - 4

4.1 कम्प्यूटर में हिन्दी के विभिन्न अनुप्रयोग।

4.2 कम्प्यूटर अनुवाद।

4.3 रेडियो और टेलीविजन के कम्प्यूटर साधित कार्यक्रम।

प्राश्निक के लिए निर्देश :

1. प्रश्न पत्र दो भागों में विभक्त होगा । पहला भाग अनिवार्य है, जिसमें एक प्रश्न के अन्तर्गत 14 वस्तुनिष्ठ बहुविकल्पीय प्रश्न पूछे जाएंगे । वस्तुनिष्ठ प्रश्न समान रूप से चारों इकाइयों

lxxxii. HIND303 चलचित्र लेखन

चलचित्र लेखन

प्रश्न पत्र : **Skill Enhancement Course**

(SEC-4)

HIND303

Credits : 04

पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

इकाई - 1

1.1 भारतीय सिनेमा का इतिहास।

1.2 हिन्दी की आरंभिक मूक और सवाक् फिल्में।

1.3 विगत शताब्दी की लोकप्रिय हिन्दी फिल्में, लोकप्रिय फिल्मी गीत तथा प्रसिद्ध संवाद।

इकाई - 2

2.1 प्रमुख निर्देशक एवं अभिनेता।

2.2 हॉलीवुड फिल्मों की हिन्दी डबिंग।

2.3 बॉलीवुड का हिन्दी फिल्मी उद्योग।

इकाई - 3

3.1 फिल्म निर्माण की प्रक्रिया।

3.2 हिन्दी पटकथा लेखन (सिनेरियो) का क्रमिक विकास, संवाद लेखन-प्रणाली या प्रविधि।

3.3 रीमेक फिल्मों का भाषिक पक्ष, समकालीन हिन्दी फिल्मों की भाषिक संरचना।

इकाई - 4

4.1 वृत्त चित्र की निर्माण पद्धति, फीचर।

4.2 हिन्दी में निर्मित विज्ञापन फिल्में (एड्-फिल्में)।

4.3 फिल्मी अभिनेताओं द्वारा उच्चारित संवादों का स्वनिम के आधार पर विश्लेषण।

4.4 हिन्दी की विश्व व्याप्ति में फिल्मों की भूमिका। हिन्दी की प्रमुख फिल्मों के आधार पर भाषिक संरचना का व्यावहारिक प्रशिक्षण- देवदास (तीनों निर्मितियाँ) तथा शोले।

lxxxiii. HIND304 समाचार संकलन और लेखन

समाचार संकलन और लेखन

प्रश्न पत्र : **Skill Enhancement Course**

(SEC-4)

HIND304

Credits : 04

पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

इकाई - 1

1.1 समाचार : अवधारणा, परिभाषा, बुनियादी तत्त्व, समाचार और संवाद, संरचना (घटक), समाचार मूल्य। समाचार के स्रोत।

1.2 समाचार संग्रह-पद्धति और लेखन-प्रक्रिया : सिद्धान्त और मार्गदर्शक बातें। विकासशील और जनरुचि की दृष्टियाँ।

इकाई - 2

2.1 समाचार का वर्गीकरण। खोजी, व्याख्यात्मक, अनुवर्तन समाचार।

2.2 संवाददाता : भूमिका, अर्हता, श्रेणियाँ, प्रकार्य एवं व्यवहार-संहिता।

2.3 रिपोर्टिंग के क्षेत्र और प्रकार : विधायिका, न्यायपालिका, मंत्रालय और प्रशासन, विदेश, रक्षा, राजनीति, अपराध और न्यायालय, दुर्घटना एवं नैसर्गिक आपदा, ग्रामीण, कृषि, विकास, अर्थ एवं वाणिज्य, बैठकें एवं सम्मेलन, संगोष्ठी, पत्रकार वार्ता, साहित्य एवं संस्कृति, विज्ञान, अनुसंधान एवं तकनीकी विषय, खेलकूद, पर्यावरण, मानवाधिकार और अन्य सामाजिक विषयों और क्षेत्रों से सम्बन्धित रिपोर्टिंग।

इकाई - 3

3.1 इलेक्ट्रॉनिक माध्यमों से प्राप्त समाचारों का पुनर्लेखन।

3.2 लीड : अर्थ, प्रकार, विशेषता, महत्त्व।

इकाई - 4

4.1 शीर्षक : अर्थ, प्रकार, लिखने की कला, महत्त्व।

lxxxiv. HIND308 सर्जनात्मक लेखन के विविध क्षेत्र

सर्जनात्मक लेखन के विविध क्षेत्र

प्रश्न पत्र : **Generic Elective Course**

(GE-2)

HIND308

Credits : 06

पूर्णांक : 100 (आई.सी.डी.ई.ओ.एल. एवं प्राईवेट परीक्षार्थी)

पूर्णांक : 70 (रेगुलर परीक्षार्थी)

आन्तरिक मूल्यांकन : 30

समय : तीन घण्टे

इकाई - 1

1.1 रिपोर्ताज़ : अर्थ, स्वरूप, रिपोर्ताज एवं अन्य गद्य रूप, रिपोर्ताज और फीचर लेखन-प्रविधि।

1.2 फीचर लेखन : विषय-चयन, सामग्री-निर्धारण, लेखन-प्रविधि। सामाजिक, आर्थिक, सांस्कृतिक, विज्ञान, पर्यावरण, खेलकूद से सम्बद्ध विषयों पर फीचर लेखन।

इकाई - 2

2.1 साक्षात्कार (इण्टरव्यू/भेंटवार्ता) : उद्देश्य, प्रकार, साक्षात्कार-प्रविधि, महत्त्व।

2.1 स्तंभ लेखन : समाचार पत्र के विविध स्तंभ, स्तंभ लेखन की विशेषताएँ, समाचार पत्र और सावधि पत्रिकाओं के लिए समसामयिक, ज्ञानवर्धक और मनोरंजक सामग्री का लेखन। सप्ताहांत अतिरिक्त सामग्री और परिशिष्ट।

इकाई - 3

3.1 दृश्य-सामग्री (छायाचित्र, कार्टून, रेखाचित्र, ग्राफिक्स आदि) से संबन्धित लेखन।

इकाई - 4

4.1 बाजार, खेलकूद, फिल्म, पुस्तक और कला समीक्षा।

4.2 आर्थिक पत्रकारिता, खेल पत्रकारिता, ग्रामीण और विकास पत्रकारिता, फोटो पत्रकारिता।

20. MUSIC

lxxxv. Hindustani Music

COURSE CODE MUSA103TH

Hindustani Music (Vocal/Inst.)

B.A.1st Year

Duration	Paper-II Theory (Unit-I)	Max Marks	Credits
3 hours		50 (35 + 15 Assesment)	3

Title -Theory of Indian Music (General) & Biographies of Musicians, Composers & Musicologists.

There will be three sections, candidates shall have to answer one question from each section & two from any of the three sections , thus five questions in all.

SECTION-I

Study of the following terms:-

Mela (Thãt), ÃshrayRãga, RãgaLakshana, Shruti, Alankar, Gamak, Vadi-Samvãdi-Anuvãdi-Vivãdi, VakraSwara, Varjit-Swara.

21. CHEMISTRY

lxxxvi. CHEM204 FUEL CHEMISTRY & CHEMISTRY OF COSMETICS & PERFUMES

CHEM 204
FUEL CHEMISTRY
&
CHEMISTRY OF COSMETICS & PERFUMES

Max. Marks: 80 **Time allowed: 03 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of 15 marks each and may contain more than one part. Section E will be of 20 marks and consists of 10 objective type questions (in MCQ/true and false / fill in the blanks) of one mark each and 5 short answer questions of two marks each covering the entire paper.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION-A

Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value.
Coal: Uses of coal (fuel and nonfuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke. Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Petroleum and Petrochemical Industry: Composition of crude petroleum. Refining and different types of petroleum products and their applications (18 Hours)

lxxxvii. CHEM307 CHEMICAL TECHNOLOGY & SOCIETY AND BUSINESS SKILLS FOR CHEMISTRY

CHEM 307

CHEMICAL TECHNOLOGY & SOCIETY and BUSINESS SKILLS FOR CHEMISTRY

Max. Marks: 70 **Time allowed: 03 Hours**
Credits: 4

Note for Examiners and Students:

1. *The question paper will consist of five sections A, B, C, D and E. Section E will be compulsory. Examiner will set nine questions in all, selecting two questions from section A, B, C, and D of 15 marks each and may contain more than one part. Section E will be of 10 marks and consists of 10 objective type questions (in MCQ/true and false / fill in the blanks) of one mark each covering the entire syllabus of the paper.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each section including the compulsory question. The duration of the examination will be 3 hours.*

SECTION-A

Chemical Technology

Basic principles of distillation, solvent extraction, solid-liquid leaching and liquid-liquid extraction, separation by absorption and adsorption. An introduction into the scope of different types of equipment needed in chemical technology, including reactors, distillation columns, extruders, pumps, mills, emulgators. Scaling up operations in chemical industry. Introduction to clean technology. (18 Hours)

SECTION-B

Society

Exploration of societal and technological issues from a chemical perspective. Chemical and scientific literacy as a means to better understand topics like air and water (and the trace materials found in them that are referred to as pollutants); energy from natural sources (i.e. solar and renewable forms), from fossil fuels and from nuclear fission; materials like plastics and polymers and their natural analogues, proteins and nucleic acids, and molecular reactivity and interconversions from simple examples like combustion to complex instances like genetic engineering and the manufacture of drugs. (18 Hours)

Section - C

Business Basics

Business Basics

Key business concepts: Business plans, market need, project management and routes to market.

Chemistry in Industry

Current challenges and opportunities for the chemistry-using industries, role of chemistry in India and global economies. (12 Hours)

Section - D

Making money

Financial aspects of business with case studies

Intellectual property

Concept of intellectual property, patents. (12 Hours)

Reference Books:

1. www.rsc.org
2. John W. Hill, Terry W. McCreary & Doris K. Kolb, Chemistry for changing times 13th Ed.

22. MATHEMATICS

lxxxviii. SEC MATH306TH Linear Programming

HIMACHAL PRADESH UNIVERSITY

B.Sc (Physics, Chemistry/Computer Science, Mathematics),

B.Sc./ B.A. with Mathematics

Syllabus and Examination Scheme

Course Code	MATH306TH
Credits= 6	L-5,T-1,P-0
Name of the Course	Linear Programming
Type of the Course	Discipline Specific Elective
Number of teaching hours required for this course	75 hrs.
Continuous Comprehensive Assessment: Based on Minor Test(1), Class tests, Assignments, Quiz, Seminar and Attendance (Marks Attendance: 5 marks to be given as per the regulations)	Max. Marks:30
Tutorials : Solving Problems and exercises	15 hours
Yearly Based Examination	Max Marks: 70 Maximum Time: 3 hrs.
Total Lectures to be Delivered (One Hour Each)	75

Instructions

DSE 3B.3: Linear Programming

Unit-I (19 **hrs.**)

Linear Programming Problems, Graphical Approach for Solving some Linear Programs. Convex Sets, Supporting and Separating Hyperplanes.

Unit-II (19 **hrs.**)

Theory of simplex method, optimality and unboundedness, the simplex algorithm, simplex method in tableau format.

Unit-III (19 **hrs.**)

Introduction to artificial variables, two-phase method, Big-M method and their comparison.

Unit-IV (18 **hrs.**)

Duality, formulation of the dual problem, primal- dual relationships, economic interpretation of

the dual, sensitivity analysis.

Recommended Books

1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear programming and Network Flows,* 2nd Ed., John Wiley and Sons, India, 2004.
2. F.S. Hillier and G.J. Lieberman, *Introduction to Operations Research,* 8th Ed., Tata McGraw Hill, Singapore, 2004.
Hamdy A. Taha, *Operations Research, An Introduction,* 8th Ed., Prentice-Hall India, 2006.

lxxxix. SEC MATH314TH Mathemactical Finance

B.Sc (Physics, Chemistry/Computer Science, Mathematics),

B.Sc./ B.A. with Mathematics

Syllabus and Examination Scheme

Course Code	MATH314TH
Credits= 4	L-4,T-0,P-0
Name of the Course	Mathematical Finance
Type of the Course	Skill Enhancement Course
Number of hours required for this course	60 hrs.
Continuous Comprehensive Assessment: Based on Minor Test(2), Class tests, Assignments, Quiz, Seminar and Attendance (Marks Attendance: 5 marks to be given as per the regulations)	Max. Marks:30
Tutorials : Solving Problems and exercises	Nil
Yearly Based Examination	Max Marks: 70 Maximum Times: 3 hrs.
Lectures to be Delivered (One Hour Each)	60

Instructions

SEC 3.8: Mathematical Finance
(In B.Sc/B.A. Mathematics this course is Sec 3.2)

Unit-I (15 hrs.)

Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money.

Unit-II (15 hrs.)

Inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR.

Unit-III (15 **hrs.**)

Bonds, bond prices and yields. Floating-rate bonds, immunization.
Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance and correlation).

Unit-IV (15 **hrs.**)

Random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints).

Books Recommended:

1. David G. Luenberger, *Investment Science*, Oxford University Press, Delhi, 1998.
2. John C. Hull, Options, *Futures and Other Derivatives,* 6th Ed., Prentice-Hall India, Indian reprint, 2006.
3. Sheldon Ross, *An Elementary Introduction to Mathematical Finance*, 2nd Ed., Cambridge University Press, USA, 2003.

xc. SEC MATH317TH Transportation and Game Theory

B.Sc./ B.A. with Mathematics

Syllabus and Examination Scheme

Course Code	MATH317TH
Credits= 4	L-4,T-0,P-0
Name of the Course	Transportation and Game Theory
Type of the Course	Skill Enhancement Course
Number of hours required for this course	60 hrs.
Continuous Comprehensive Assessment: Based on Minor Test(1), Class tests, Assignments, Quiz, Seminar and Attendance (Marks Attendance: 5 marks to be given as per the regulations)	Max. Marks:30
Tutorials : Solving Problems and exercises	Nil
Yearly Based Examination	Max Marks: 70 Maximum Time: 3 hrs.
Lectures to be Delivered (One Hour Each)	60

Instructions

SEC 3.11: Transportation and Game Theory
(In B.Sc/B.A. Mathematics this course is Sec 4.2)

Unit-I (15 **hrs.**)

Transportation problem and its mathematical formulation. northwest-corner method, least cost method.

Unit-II (15 **hrs.**)

Vogel approximation method for determination of starting basic solution, algorithm for solving transportation problem.

Unit-III (15 **hrs.**)

Assignment problem and its mathematical formulation, Hungarian method for solving assignment problem.

Unit-IV (15 **hrs.**)

Game theory: formulation of two person zero sum games, solving two person zero sum games, games with mixed strategies, graphical solution procedure.

Books Recommended:

1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear Programming and Network Flows,* 2nd Ed., John Wiley and Sons, India, 2004.
2. F. S. Hillier and G. J. Lieberman, *Introduction to Operations Research,* 9th Ed., Tata McGraw Hill, Singapore, 2009.
3. Hamdy A. Taha, *Operations Research, An Introduction,* 8th Ed., Prentice-Hall India, 2006.

xci. GE MATH319 Portfolio Optimization

HIMACHAL PRADESH UNIVERSITY

B.Sc (Physics, Chemistry/Computer Science, Mathematics),

B.Sc./ B.A. with Mathematics

Syllabus and Examination Scheme

Course Code	MATH319TH
Credits= 6	L-5,T-1,P-0
Name of the Course	Portfolio Optimization
Type of the Course	Generic Elective
Number of teaching hours required for this course	75 hrs.
Continuous Comprehensive Assessment: Based on Minor Test(1), Class tests, Assignments, Quiz, Seminar and Attendance (Marks Attendance: 5 marks to be given as per the regulations)	Max. Marks:30
Tutorials : Solving Problems and exercises	15hours
Yearly Based Examination	Max Marks: 70 Maximum Times: 3 hrs.
Total Lectures to be Delivered (One Hour Each)	75

Instructions

GE1.1: Portfolio Optimization

Unit-I (19 hrs.)

Financial markets. Investment objectives. Measures of return and risk. Types of risks.

Unit-II (19 hrs.)

Portfolio of assets. Expected risk and return of portfolio. Diversification.

Unit-III (19 hrs.)

Mean-variance portfolio optimization- the Markowitz model and the two-fund theorem,

Unit-IV (18 hrs.)

xcii. GE MATH322TH Sample Surveys and Design of Experiments

HIMACHAL PRADESH UNIVERSITY

B.Sc (Physics, Chemistry/Computer Science, Mathematics),

B.Sc./ B.A. with Mathematics

Syllabus and Examination Scheme

Course Code	MATH322TH
Credits= 6	L-5,T-1,P-0
Name of the Course	Sample Surveys and Design of Experiments
Type of the Course	Generic Elective
Number of teaching hours required for this course	75 hrs.
Continuous Comprehensive Assessment: Based on Minor Test(1), Class tests, Assignments, Quiz, Seminar and Attendance (Marks Attendance: 5 marks to be given as per the regulations)	Max. Marks:30
Tutorials : Solving Problems and exercises	15 hours
Yearly Based Examination	Max Marks: 70 Maximum Time: 3 hrs.

GE 2.2: Sample Surveys and Design of Experiments

Unit-I (19 hrs.)

Sample Surveys: Concepts of population and sample. Complete enumeration vs. sampling. Need for sampling. Principal and organizational aspects in the conduct of a sample survey. Properties of a good estimator, Sampling and non-sampling errors.

SRSWR & SRSWOR, determination of sample size. Stratified random sampling and different allocations. Systematic sampling, comparison of known sampling strategies under linear trend.

Ratio and Regression estimators and their comparison with SRSWOR estimator.Unit-II (19 **hrs.**)

Indian Official Statistics: Present Official Statistical System in India relating to census of population, agriculture, industrial production, and prices; methods of collection of official statistics, their reliability and limitation and the principal publications containing such statistics. Also the various agencies responsible for the data collection- C.S.O., N.S.S.O., Office of Registrar General, their historical development, main functions and important publications.
Analysis of variance and covariance: Analysis of variance and covariance (with one concomitant variable) in one-way and two-way classified data with equal number of observations per cell.

Unit-III (19 **hrs.**)

Design of experiments: Principles of experimentation, uniformity trails, completely randomized, Randomized block and Latin square designs. Missing plot technique, 2^2 and 2^3 Factorial experiments: construction and analysis.

Unit-IV (18 **hrs.**)

Regression Analysis: Two variable linear model – estimation, testing and problems of predication. Predication of the estimated regression equation, interval estimation, variance estimation.

Books Recommended

1. W.G. Cochran, *Sampling Techniques*, John Wiley and Sons, New York, 1997

23. PHYSICAL EDUCATION

xciii. PED 101 INTRODUCTION TO PHYSICAL EDUCATION

COURSE CONTENTS IN DETAIL

Year-I

THEORY COURSE

COURSE CODE: PED101TH **(DSC-1A)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=50+CCA=30) =80

INTRODUCTION TO PHYSICAL EDUCATION

Unit-I Introduction

1. Meaning, Definition, Need and Scope of Physical Education.
2. Aim and Objectives of Physical Education.
3. Importance of Physical Education in present era.
4. Misconceptions about Physical Education.
5. Relationship of Physical Education with General Education.
6. Physical Education as an Art and Science.

Unit-II

1. Historical Development of Physical Education in India {Pre-Independence-(Ancient India, Medieval and British Period)}.

2. Physical Education in India (Post-Independence).
3. Contribution of Akhadas, Vyayamshalas and Y.M.C.A.
4. Modern Perspectives: National Awards/State Awards and Honours, Arjuna Award, Rajiv Gandhi Khel Ratna Award, Dronacharya Award, M.A.K.A. Trophy and Parshu Ram Award.

xciv. PED102 OLYMPIC MOVEMENT AND ORGANIZATION OF TOURNAMENTS

Year-I

THEORY COURSE

COURSE CODE: PED102TH **(DSC-1B)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=50+CCA=30) =80

OLYMPIC MOVEMENT AND ORGANIZATION OF TOURNAMENTS

Unit-I Olympics Games, Asian Games and Commonwealth Games

1. Olympic Movement: Ancient and Modern Olympics Games.
2. Importance of Olympic Games, Objectives of Olympic, Olympic Motto, Emblem, Flag, Olympic Torch and Awards, Opening and Closing Ceremonies.
3. Asian Games: Historical background of Asian Games.
4. Performance of India at Olympic Games, World Championship, Asian Games, SAF and Commonwealth Games.

Unit-II Promotion of Physical Education and Sports in India

1. Promotion of Physical Education and Sports: Policies, Schemes.
2. Role of IOA, SAI, NSNIS and Khelo Bharat Abhiyan in the development of Physical Education and Sports in India.
3. Causes of deterioration of Sports Performance.
4. Indian National Sports Policy and Sports Policy of Himachal Pradesh.

Unit-III Intramurals and Extramurals

1. Intramurals :
   i) Its importance and planning.
   ii) Events of competitions, time and facility factor.
2. Extramurals :

2. Types of Tournaments: Knock-Out and League Tournament, Process of Draw of Fixture, Merits and Demerits of various kinds of Tournaments.
3. Protocols to organise College Annual Athletic Meet.

References:

1. Carto, J.E.L. And Calif, S.D. [ed], "Medicine & Sport Science: Physical Structure of Olympic Athletes", London: Karger, 1984.
2. Cliw, Gifford, "Summer Olympic", 2004.
3. Daw, Anderson, "The Story of the Olympics", 2008.
4. Maranirs, David, "Rome 1960: The Olympics that Changed the World", 2008.
5. Osbome, Manpope, "Ancient Greece and the Olympic", 2004.
6. Perrottet, Tony, "The Naked Olympics: The True Story of the Ancient Games", 2004.
7. Singh, M.K., "Indian Women and Sports", Rawat Publication, 1991.

xcv. PED203 SPORTS MEDICINE, PHYSIOTHERAPY AND REHABILITATION

Year-II

THEORY COURSE

COURSE CODE: PED203TH **(SEC-1)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=70+CCA=30) =100

SPORTS MEDICINE, PHYSIOTHERAPY AND REHABILITATION

Unit-I Sports Medicine

1. Sports Medicine: Meaning, definition, aims, objectives, modern concepts and importance.
2. Injuries: Type of sports injuries, prevention of injuries in sports, common sports injuries and their diagnosis.
3. First Aid: Meaning, objectives and precautionary measures while giving first aid and PRICE.
4. Treatment of Laceration, Blisters, Contusion, Strain, Sprain, Fracture, Dislocation and Cramps.

Unit-II Common Accidents and Ergogenic Aids

1. Emergency treatment for common accidents: Drowning, Burning, Insect stings & bitings, Snake bite, Dog bite, Poisoning, Unconsciousness, Fainting, Hysteria, Sunstroke, Shock, Electric shock and Acid burn.
2. Doping: Meaning and Definition.
    a. NADA (An Introduction).
    b. WADA (An Introduction).
    c. Aims and Objectives of NADA and WADA.
3. Ergogenic aids in sports and their ill effects :
    a. Anabolic agents
    b. Stimulants
    c. Beta blockers
    d. Narcotic analgesics
    e. Diuretics
    f. Blood doping

Unit-III Physiotherapy

1. Physiotherapy: Definition, guiding principles of physiotherapy and importance of physiotherapy.

xcvi. PED204 SPORTS TRAINING

Year-II

THEORY COURSE

COURSE CODE: PED204TH **(SEC-2)**

Credits: 4 **(L=44+T=16+P=0) =60**

Marks: (ETE=70+CCA=30) =100

SPORTS TRAINING

Unit-I

1. Sports Training: Introduction, Meaning and Definition of Sports Training.
2. Aim and Objectives of Sports Training.
3. Principles of Sports Training, System of Sports Training.
4. Basic Performance, Good Performance and High Performance Training.

Unit-III

1. Training Process: Training Load, Definition and Types of Training Load.
2. Principles of Intensity and Volume.
3. Technical Training: Meaning and Methods of Technical Training.
4. Tactical Training: Meaning and Methods of Tactical Training.

Unit-IV

1. Training Programming and Planning: Periodization, Meaning and types of Periodization.
2. Aim and Content of Periods-Preparatory, Competition and Transitional.
3. Planning a training session.
4. Talent Identification and Development.

References:

1. Baechle, T. R, & Earle, R. W. (2000). Essentials of Strength Training and Conditioning. Human Kinetics, USA.
2. Bompa, T. O. (1994). Theory and Methods of Training-A Key to Athletic Performance (3rd Ed.), Kandwall, Hunt Publication Co.

xcvii. PED 305 RECREATION

Year-III

THEORY COURSE

COURSE CODE: PED305TH **(DSE-1A)**

Credits: 6 **(L=65+T=25+P=0) =90**

Marks: (ETE=70+CCA=30) =100

RECREATION

Unit-I

1. Meaning of Recreation, aims and objectives of Recreation.
2. Physical education and recreation.
3. Need and importance of recreation in modern age.
4. Arrangement of recreation centres.

Unit-II

1. Concept and meaning of camp, aims and objectives of camp.
2. Types of camp.
3. Agencies promoting camp.
4. Educative value of camp.

Unit-III

1. Types and nature of recreation.
2. Recreation providing agencies and recent changes in the recreational activities.
3. Responsibilities of a recreational manager.

xcviii. PED307 METHODS OF TEACHING IN PHYSICAL EDUCATION

Year-III

THEORY COURSE

COURSE CODE: PED307TH **(DSE-1B)**

Credits: 6 **(L=65+T=25+P=0) =90**

Marks: (ETE=70+CCA=30) =100

METHODS OF TEACHING IN PHYSICAL EDUCATION

Unit-I

1. Meaning and importance of methods of teaching in Physical Education.
2. Principles of teaching methods and different methods of teaching.
3. Factors affecting teaching methods.
4. Lesson Planning: Lesson plan, objectives and types of lesson plan.
5. Principles of lesson plan and values of lesson plan.
6. Class activity/Recreational part (Assembly, Revision, Reassembly and Dismissal).

Unit-II

1. Teaching aids, meaning, its importance in physical education, types of teaching aids and use and improvisation of apparatus.
2. Presentation technique, criterion of presentation technique and qualities of good presenter.
3. Factors influencing presentation technique.

3. Methods of supervision and qualities of a supervisor.
4. Evaluation of teaching methods.
5. Need and importance of evaluation.

eferences:

1. Kamlesh, M. L. and Sangral M.S., Methods in Physical Education, Parkash Brothers, 5-6 Book Market Ludhiana, 1986.
2. Bucher, C.A., Administration of Physical Education and Athletics Programme, St. Louis: The C.V. Mosby Co., 1979.
3. Organization and Management of Physical education and Sports, Rex Book Store, USA.
4. Chelladurai, P., Sport Management: Macro Perspectives. London, ON: Sports Dynamics, 1985.

24. GEOGRAPHY

xcix. FIELD TECHNIQUES & SURVEY BASED PROJECT REPORT (GEOGP 302SEC)

4. FIELD TECHNIQUES & SURVEY BASED PROJECT REPORT (GEOGP 302SEC)

Course Code	**(GEOGP 302SEC)**		
Credits-4	**L**	**T**	**P**
	15	**0**	**90(45)***
Course Type	**Skill Enhancement**		
Lectures to be Delivered	**60**		

Note: The CCA, Annual Theory Paper and Annual Practical Examination is same as in paper GEOG204 SEC

Course Content and Credit Scheme

Unit	Topic	Allotted Time (Hrs)		
		L	T	P/FW
I.	**Introduction** Field Work in Geographical Studies – Role, Value and Ethics of Field-Work. Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental.	3	0	10(5)*
II.	**Field Techniques** Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant).	4	0	20(10)*
III.	**Questionnaires** (Open/ Closed / Structured / Non-Structured); Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch).	4	0	30(15)*
IV.	**Designing the Field Report** Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.	4	0	30(20)*
	Total Hours	**15**	**0**	**90(45)***

FW-Field Work

25. PHYSICS

c. PHYS201 STATISTICAL AND THERMAL PHYSICS

2nd Year

STATISTICAL AND THERMAL PHYSICS

Name of the Course	**PHYSICS-DSC 1C: STATISTICAL AND THERMAL PHYSICS** **(Credits: Theory-04)** **Theory: 60 Lectures**
Code	PHYS201TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory**: Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Lab**: Lab Seminar + Lab Attendance = **5+5 marks.**	

21

Unit-I

Basic Ideas of Statistical Physics: Scope of statistical physics, basic ideas about probability, distribution of four distinguishable particles in two compartments of equal sizes. Concept of macro-states, micro-states, thermodynamic probability, effect of constraints on the system. **(8 Lectures)**

Distribution of Particles in Compartments: Distribution of n particles in two compartments, Deviation from the state of maximum probability. Equilibrium state of a dynamic system, distribution of n distinguishable particles in k compartments of unequal sizes. **(7 Lectures)**

Unit-II

Types of Statistics in Physics: Phase space and division into elementary cells. Three kinds of statistics. The basic approach in the three statistics. M-B. Statistics applied to an ideal gas in equilibrium, experimental verification of the Maxwell Boltzmann's law of distribution of molecular speeds. Need for quantum statistics, h as a natural constant and its implications, indistinguishability of particles and its implications. B-E statistics, **(8 Lectures)**

Bose Einstein and Fermi Dirac Statistics: Derivation of Planck's law of radiation, deduction of Wien's distribution law and Stefan's law from plank's law. Fermi-Dirac statistics.

Applications to liquid helium, free electrons gas (Fermi level and Fermi Energy), Comparison of M-B, B-E, F-D statistics. **(7 Lectures)**

Unit-III

Entropy and Laws of Thermodynamics: Application of thermodynamics to the thermoelectric effect, change of entropy along a reversible path in a p-v diagram, entropy of a perfect gas, equation of state of ideal gas from simple statistical considerations, heat death of the universe. **(7 Lectures)**

Statistical Interpretation of entropy: Statistical definition of entropy, change of entropy of system, additive nature of entropy, law of increase of entropy. Reversible and irreversible processes, example of reversible and irreversible processes. Work done in a reversible process, example of entropy in natural process, entropy and disorder.

(8 Lectures)

22

Unit-IV

Maxwell's Thermodynamic Relations and Their Applications: Thermodynamic Potentials: Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Derivation of Maxwell's thermodynamic relations. **(7 Lectures)**

Applications of thermodynamics relations. Cooling produced by adiabatic stretching, adiabatic compression, adiabatic Stretching of a wire, stretching of thin films, change of internal energy with volume. Clausius-Clapeyron Equation, Thermo dynamical treatment of Joule-Thomson effect for liquification of Helium. Production of very low temperatures by adiabatic demagnetization, TdS equations. **(8 Lectures)**

ci. PHYS203TH PHYSICS – SEC1: PHYSICS WORKSHOP SKILL

SKILL ENHANCEMENT COURSE (Any four) (Credit: 04 each)- SEC1 to SEC4

2nd Year

Part A - PHYSICS WORKSHOP SKILL - SEC1

Name of the Course	**PHYSICS – SEC1: PHYSICS WORKSHOP SKILL** **(Credits: Theory-03)** **Theory: 30 Lectures**
Code	PHYS203TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory:** Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Skill**: Project File or Dissertation Record + Seminar = **5+5 marks.**	

Introduction: Measuring units, conversion to SI and CGS. Familiarization with meter scale, Vernier calliper, Screw gauge and their utility. Measure the dimension of a solid block, volume of cylindrical beaker/glass, diameter of a thin wire, thickness of metal sheet, etc. Use of Sextant to measure height of buildings, mountains, etc. **(4 Lectures)**

Mechanical Skill: Concept of workshop practice. Overview of manufacturing methods: casting, foundry, machining, forming and welding. Types of welding joints and welding defects. Common materials used for manufacturing like steel, copper, iron, metal sheets, composites and alloy, wood. Concept of machine processing, introduction to common machine tools like lathe, shaper, drilling, milling and surface machines. Cutting tools, lubricating oils. Cutting of a metal sheet using blade. Smoothening of cutting edge of sheet using file. Drilling of holes of different diameter in metal sheet and wooden block. Use of bench vice and tools for fitting. Make funnel using metal sheet. **(10 Lectures)**

Electrical and Electronic Skill: Use of Multimeter. Soldering of electrical circuits having discrete components (R, L, C, diode) and ICs on PCB. Operation of oscilloscope. Making regulated power supply. Timer circuit, Electronic switch using transistor and relay. **(10 Lectures)**

Introduction to prime movers: Mechanism, gear system, wheel, Fixing of gears with motor axel. Lever mechanism, Lifting of heavy weight using lever, braking systems, pulleys, working principle of power generation systems. Demonstration of pulley experiment. **(6 Lectures)**

cii. PHYS204TH PHYSICS –SEC1: COMPUTATIONAL PHYSICS

2nd Year

Part A - COMPUTATIONAL PHYSICS - SEC1

Name of the Course	**PHYSICS –SEC1: COMPUTATIONAL PHYSICS** **(Credits: Theory-03)** **Theory: 30 Lectures**
Code	PHYS204TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory:** Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Skill**: Project File or Dissertation Record + Seminar = **5+5 marks.**	

PHYSICS-SEC1: COMPUTATIONAL PHYSICS SKILL EXAM

- **Skill based Project or Dissertation work on any topic of syllabus mentioned under Computational Physics (PHYS204TH) for Analytical skill/ Problem solving.**

Instructions for Paper Setters and Candidates:

1. *Examiner will set seven questions in all covering the entire syllabus each of 10 marks ,*
2. *The candidate will be required to attempt five questions in all . The duration of the examination will be 3 hours.*

The aim of this course is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- *Highlights the use of computational methods to solve physical problems*
- *Use of computer language as a tool in solving physics problems (applications)*
- *Course will consist of hands on training on the Problem solving on Computers.*

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. **Algorithms and Flowcharts:** Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of two matrices, Sum and Product of a finite series, calculation of sin (x) as a series, algorithm for

plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal. **(4 Lectures)**

Scientific Programming: Some fundamental Linux Commands (Internal and External commands). Development of FORTRAN. Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of Fortran Program, Format of writing Program and concept of coding, Initialization and Replacement Logic. Examples from physics problems.

(4 Lectures)

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical **IF**, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder

Programming:

1. Exercises on syntax on usage of Object oriented C++/FORTRAN
2. Usage of GUI Windows, Linux Commands, familiarity with DOS commands and working in an editor to write sources codes in FORTRAN.

3. To print out all natural even/ odd numbers between given limits.
4. To find maximum, minimum and range of a given set of numbers.
5. Calculating Euler number using exp(x) series evaluated at x=1 **(4 Lectures)**

Scientific word processing: Introduction to LaTeX: TeX/LaTeX word processor, preparing a basic LaTeX file, Document classes, preparing an input file for LaTeX, Compiling LaTeX File, LaTeX tags for creating different environments, Defining LaTeX commands and environments, Changing the type style, Symbols from other languages. **Equation representation:** Formulae and equations, Figures and other floating bodies, Lining in columns- Tabbing and tabular environment, Generating table of contents, bibliography and citation, Making an index and glossary, List making environments, Fonts, Picture environment and colors, errors.

(4 Lectures)

Introduction to electronic spreadsheet: Brief history and applications, Features of MS Excel, Organization of spreadsheet, Building a spreadsheet, Entering data: Text data, numeric data, formulae, entering different functions (Mathematical, Statistical, Trigonometric, Logical, Text and Financial); Types of operators (Arithmetic, Comparison, Text Concatenation and

(4 Lectures)

Visualization: Introduction to graphical analysis and its limitations. Introduction to Gnuplot. importance of visualization of computational and computational data, basic Gnuplot commands: simple plots, plotting data from a file, saving and exporting, multiple data sets per file, physics with Gnuplot (equations, building functions, user defined variables and functions), Understanding data with Gnuplot. **(4 Lectures)**

Hands on exercises:

ciii. PHYS205TH- PHYSICS-SEC1/ SEC2: ELECTRICAL CIRCUITS AND NETWORK SKILLS

2nd Year

Part A - ELECTRICAL CIRCUITS AND NETWORK SKILLS – SEC1/SEC2

Name of the Course	**PHYSICS-SEC1/ SEC2: ELECTRICAL CIRCUITS AND NETWORK SKILLS** **(Credits: Theory-03)** **Theory: 30 Lectures**
Code	PHYS205TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory:** Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Skill**: Project File or Dissertation Record + Seminar = **5+5 marks.**	

Part B - ELECTRICAL CIRCUITS AND NETWORK SKILLS EXAM – SEC1/SEC2

Name of the Course	**PHYSICS-SEC1/SEC2: ELECTRICAL CIRCUITS AND NETWORK SKILLS EXAM**

Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with multimeter, voltmeter and ammeter.

(3 Lectures)

Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money. **(4 Lectures)**

Electrical Drawing and Symbols: Drawing symbols. Blueprints. Reading Schematics. Ladder diagrams. Electrical Schematics. Power circuits. Control circuits. Reading of circuit schematics. Tracking the connections of elements and identify current flow and voltage drop.

(4 Lectures)

Generators and Transformers: DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers.

(3 Lectures)

Electric Motors: Single-phase, three-phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor.

(4 Lectures)

Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources

(3 Lectures)

Electrical Protection: Relays. Fuses and disconnect switches. Circuit breakers. Overload

civ. PHYS206TH PHYSICS-SEC2: BASIC INSTRUMENTATION SKILLS

2nd Year

Part A - BASIC INSTRUMENTATION SKILLS - SEC2

Name of the Course	**PHYSICS-SEC2: BASIC INSTRUMENTATION SKILLS** **(Credits: Theory-03)** **Theory: 30 Lectures**
Code	PHYS206TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**

Instructions for Paper Setters and Candidates:

1. *Examiner will set seven questions in all covering the entire syllabus each of 10 marks ,*
2. *The candidate will be required to attempt five questions in all . The duration of the examination will be 3 hours.*

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. **Multimeter:** Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance. **(4 Lectures)**

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance. **AC millivoltmeter:** Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance. **(4 Lectures)**

Cathode Ray **Oscilloscope:** Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. **(6 Lectures)**

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. **(3 Lectures)**

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis. **(4 Lectures)**

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment.
4. Use of Digital multimeter/VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment.
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.

cv. PHYS301TH PHYSICS-DSE 1A: ELEMENTS OF MODERN PHYSICS

3rd Year

ELEMENTS OF MODERN PHYSICS

Name of the Course	**PHYSICS-DSE 1A: ELEMENTS OF MODERN PHYSICS** **(Credits: Theory-04)** **Theory: 60 Lectures**
Code	PHYS301TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory**: Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Lab**: Lab Seminar + Lab Attendance = **5+5 marks.**	

Instructions for Paper Setters and Candidates:

1. *The question paper will consist of five sections: Section A(compulsory, covering syllabus from all the units),section B(Unit I), section C(Unit II),section D(Unit III) and section E(Unit IV). Examiner will set nine questions in all, question number 1 (One) will be compulsory and selecting two questions each from Units I, II, III and IV respectively. Each question from*

Unit-I

Planck's quantum, Planck's constant and light as a collection of photons; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment. **(10 Lectures)**

Problems with Rutherford model- instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra. **(5 Lectures)**

Unit-II

Heisenberg uncertainty principle- impossibility trajectory; estimating minimum energy of a confined principle; Energy-time uncertainty principle. Wave-particle duality.

(4 Lectures)

Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wave function, probabilities and normalization; Probability and probability current densities in one dimension.

(11 Lectures)

Unit-III

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier. **(10 Lectures)**

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy.

(5 Lectures)

Unit-IV

Radioactivity: stability of nucleus; Law of radioactive decay; Mean life & half-life; α decay; β decay - energy released, spectrum and Pauli's prediction of neutrino; γ-ray emission.

(11 Lectures)

Fission and fusion - mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions. **(4 Lectures)**

Reference Books:

PRACTICALS – DSE 1A LAB: ELEMENTS OF MODERN PHYSICS

60 Lectures

1. To determine value of Boltzmann constant using V-I characteristic of PN diode.
2. To determine work function of material of filament of directly heated vacuum diode.
3. To determine value of Planck's constant using LEDs of at least 4 different colours.
4. To determine the ionization potential of mercury.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the absorption lines in the rotational spectrum of Iodine vapour.
7. To study the diffraction patterns of single and double slits using laser source and measure its intensity variation using Photosensor and compare with incoherent source – Na light.
8. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
9. To determine the value of e/m by magnetic focusing.
10. To setup the Millikan oil drop apparatus and determine the charge of an electron.
11. To verify the inverse square law by using photovoltaic cell.
12. To measure the DC voltage by using CRO
13. To display the action of junction Diode as (a) Half wave rectifier and (b) Full wave rectifier using CRO
14. To determine e/m by magnetron method or small solenoid method.

Reference Books:

- Advanced Practical Physics for students, B.L. Flint & H.T. Worsnop, 1971, Asia Publishing House.

cvi. PHYS303TH PHYSICS-DSE 1A: ASTRONOMY AND ASTROPHYSICS

3rd Year

ASTRONOMY AND ASTROPHYSICS

Name of the Course	**PHYSICS-DSE 1A: ASTRONOMY AND ASTROPHYSICS** **(Credits: Theory-05, Tutorial-01)** **Theory: 72 Lectures**
Code	PHYS303TH
Yearly Based Examination	**70 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory**: Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Tutorials**: Tutorials + Tutorial Attendance = **5+5 marks.**	

Instructions for Paper Setters and Candidates:

1. *The question paper will consist of five sections: Section A(compulsory, covering syllabus from all the units),section B(Unit I), section C(Unit II),section D(Unit III) and section E(Unit IV). Examiner will set nine questions in all, question number 1 (One) will be compulsory and selecting two questions each from Units I, II, III and IV respectively. Each question from*

cvii. PHYS304TH- PHYSICS-DSE 1B: NUCLEAR AND PARTICLE PHYSICS

3rd Year

NUCLEAR AND PARTICLE PHYSICS

Name of the Course	**PHYSICS-DSE 1B: NUCLEAR AND PARTICLE PHYSICS** **(Credits: Theory-05, Tutorials-01)** **Theory: 72 Lectures**
Code	PHYS304TH
Yearly Based Examination	**70 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory**: Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Tutorial**: Tutorial + Tutorial Attendance = **5+5 marks.**	

Instructions for Paper Setters and Candidates:

1. *The question paper will consist of five sections: Section A(compulsory, covering syllabus from all the units),section B(Unit I), section C(Unit II),section D(Unit III) and section E(Unit IV). Examiner will set nine questions in all, question number 1 (One) will be compulsory and selecting two questions each from Units I, II, III and IV respectively. Each question from section B, C, D and E will carry 12 marks. Question Number 1. (Section A), will consist of eleven sub-questions each of 2 marks of types: Multiple Choice Questions (MCQ)/fill in the blanks and/or short answer type questions.*
2. *The candidate will be required to attempt five questions in all i.e. selecting one question from each sections B, C, D and E and eleven sub-questions from section A (Compulsory question number 1). The duration of the examination will be 3 hours.*

Unit-I

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about size, mass, charge density (matter energy), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excites states.

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of various terms, condition of nuclear stability. Two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force. **(20 Lectures)**

Unit-II

Radioactivity decay:(a) Alphaα decay: basics of -decay processes, theory of α-emission, Gamowα factor, Geiger Nuttall law, -decay spectroscopy. (b) β-decay: energy kinematics for β-decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays

emission & kinematics, internal conversion.

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering (Rutherford scattering). **(18 Lectures)**

Unit-IV

Particle Physics: Particle interactions; basic features. Classification of elementary particles and its families. Conservation Laws: energy and momentum, angular momentum, parity, Baryon number, Lepton number, Isospin, Strangeness, Gell-Mann-Nishijima Scheme, CPT theorem, parity violation in weak interactions. Particle Symmetries. Quarks Model, quantum number of quarks and gluons. Quark Model of Hadrons: Quark structure of non strange and strange hadrons, Mesons and baryons containing charm and bottom quarks, explanation of their quantum numbers in terms of their constituents quarks, Quark wave function of Mesons and nucleons, need of color quantum number. Cosmic Rays; origin of cosmic rays. primary and secondary cosmic rays, hard component and soft component, the altitude effect, the latitude effect, East–west asymmetry, cosmic rays showers. **(18 Lectures)**

cviii. PHYS305TH PHYSICS-DSE 1B: QUANTUM MECHANICS

3rd Year

QUANTUM MECHANICS

Name of the Course	**PHYSICS-DSE 1B: QUANTUM MECHANICS** **(Credits: Theory-04)** **Theory: 60 Lectures**
Code	PHYS305TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory**: Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Lab**: Lab Seminar + Lab Attendance = **5+5 marks.**	

Instructions for Paper Setters and Candidates:

1. *The question paper will consist of five sections: Section A(compulsory, covering syllabus from all the units),section B(Unit I), section C(Unit II),section D(Unit III) and section E(Unit*

Unit-I

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum & Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle. **(6 Lectures)**

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to the spread of Gaussian wavepacket for a free particle in one dimension; wave packets, Fourier transforms and momentum space wavefunction; Position-momentum uncertainty principle. **(10 Lectures)**

Unit-II

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem- square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method. **(14 Lectures)**

Unit-III

Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for the second order partial differential equation; angular momentum operator and quantum numbers; Radial wave functions from Frobenius method; Orbital angular momentum quantum numbers l and m; s, p, d,.. shells (idea only) **(9 Lectures)**

Atoms in Electric and Magnetic Fields:- Electron Angular Momentum. Space Quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton. **(7 Lectures)**

Unit-IV

Atoms in External Magnetic Fields:- Zeeman Effect, Normal and Anomalous Zeeman Effect. **(4 Lectures)**

Many electron atoms:- Pauli's Exclusion Principle. Symmetric and Antisymmetric Wave Functions. Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total Angular Momentum. Vector Model. Spin-orbit coupling in atoms-L-S and J-J couplings. **(10 Lectures)**

Reference Books:

cix. PHYS306TH PHYSICS-DSE 1B: PHYSICS OF DEVICES AND INSTRUMENTS

3rd Year

PHYSICS OF DEVICES AND INSTRUMENTS

Name of the Course	**PHYSICS-DSE 1B: PHYSICS OF DEVICES AND INSTRUMENTS** **(Credits: Theory-04)** **Theory: 60 Lectures**
Code	PHYS306TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory**: Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Lab**: Lab Seminar + Lab Attendance = **5+5 marks.**	

response, lock and capture. Basic idea of PLL IC (565 or 4046).

(5 Lectures)

Unit-III

Processing of Devices: Basic process flow for IC fabrication, Electronic grade silicon. Crystal plane and orientation. Defects in the lattice. Oxide layer. Oxidation Technique for Si. Metallization technique. Positive and Negative Masks. Optical lithography. Electron lithography. Feature size control and wet anisotropic etching. Lift off Technique. Diffusion and implantation

(12 Lectures)

Unit-IV

Introduction to communication systems: Block diagram of electronic communication system. Need for modulation. Amplitude modulation. Modulation Index. Analysis of Amplitude Modulated wave. Sideband frequencies in AM wave. CE Amplitude Modulator. Demodulation of AM wave using Diode Detector. basic idea of Frequency, Phase, Pulse and Digital Modulation including ASK, PSK, FSK. **(15 lectures)**

Digital Data Communication Standards: Serial Communications: RS232, Handshaking, Implementation of RS232 on PC. Universal Serial Bus (USB): USB standards, Types and elements of USB transfers. Devices (Basic idea of UART). Parallel Communications: General

Section-A:

1. To design a power supply using bridge rectifier and study effect of C-filter.
2. To design the active Low pass and High pass filters of given specification.
3. To design the active filter (wide band pass and band reject) of given specification.
4. To study the output and transfer characteristics of a JFET.
5. To design a common source JFET Amplifier and study its frequency response.
6. To study the output characteristics of a MOSFET.
7. To study the characteristics of a UJT and design a simple Relaxation Oscillator.
8. To design an Amplitude Modulator using Transistor.
9. To design PWM, PPM, PAM and Pulse code modulation using ICs.
10. To design an Astable multivibrator of given specifications using transistor.
11. To study a PLL IC (Lock and capture range).
12. To study envelope detector for demodulation of AM signal.
13. Study of ASK and FSK modulator.
14. Glow an LED via USB port of PC.
15. Sense the input voltage at a pin of USB port and subsequently glow the LED connected with another pin of USB port.

Section-B:

SPICE/MULTISIM simulations for electrical networks and electronic circuits:

1. To verify the Thevenin and Norton Theorems.

cx. PHYS307TH- PHYSICS-SEC3: RADIATION SAFETY

3'" Year

Part A - RADIATION SAFETY – SEC3

Name of the Course	**PHYSICS-SEC3: RADIATION SAFETY** **(Credits: Theory-03)** **Theory: 30 Lectures**
Code	PHYS307TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory:** Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Skill**: Project File or Dissertation Record + Seminar = **5+5 marks.**	

Instructions for Paper Setters and Candidates:

1. *Examiner will set seven questions in all covering the entire syllabus each of 10 marks ,*
2. *The candidate will be required to attempt five questions in all. The duration of the examination will be 3 hours.*

The aim of this course is for awareness and understanding regarding radiation hazards and safety. The list of laboratory skills and experiments listed below the course are to be done in continuation of the topics

Basics of Atomic and Nuclear Physics: Basic concept of atomic structure; X rays characteristic and production; concept of bremsstrahlung and auger electron, The composition of nucleus and its properties, mass number, isotopes of element, spin, binding energy, stable and unstable isotopes, law of radioactive decay, Mean life and half life, basic concept of alpha, beta and gamma decay, concept of cross section and kinematics of nuclear reactions, types of nuclear reaction, Fusion, fission. **(6 Lectures)**

Interaction of Radiation with matter: Types of Radiation: Alpha, Beta, Gamma and Neutron and their sources, sealed and unsealed sources, **Interaction of Photons -** Photo-electric effect, Compton Scattering, Pair Production, Linear and Mass Attenuation Coefficients, **Interaction of Charged Particles:** Heavy charged particles - Beth-Bloch Formula, Scaling laws, Mass Stopping Power, Range, Straggling, Channeling and Cherenkov radiation. Beta Particles- Collision and Radiation loss (Bremsstrahlung), **Interaction of Neutrons-** Collision, slowing down and Moderation. **(7 Lectures)**

Radiation detection and monitoring devices: Radiation Quantities and Units: Basic idea of different units of activity, KERMA, exposure, absorbed dose, equivalent dose, effective dose, collective equivalent dose, Annual Limit of Intake (ALI) and derived Air Concentration (DAC). **Radiation detection:** Basic concept and working principle of gas detectors (Ionization Chambers, Proportional Counter, Multi-Wire Proportional Counters (MWPC) and Gieger Muller Counter), Scintillation Detectors (Inorganic and Organic Scintillators), Solid States Detectors and Neutron Detectors, Thermo luminescent Dosimetry.

(7 Lectures)

Radiation safety management: Biological effects of ionizing radiation, Operational limits and basics of radiation hazards evaluation and control: radiation protection standards, International Commission on Radiological Protection (ICRP) principles, justification, optimization, limitation, introduction of safety and risk management of radiation. Nuclear waste and disposal management. Brief idea about Accelerator driven Sub-critical system (ADS) for waste management. **(5 Lectures)**

Application of nuclear techniques: Application in medical science (e.g., MRI, PET, Projection Imaging Gamma Camera, radiation therapy), Archaeology, Art, Crime detection,

cxi. PHYS309TH PHYSICS-SEC4: WEATHER FORECASTING

3rd Year

Part A - WEATHER FORECASTING - SEC4

Name of the Course	**PHYSICS-SEC4: WEATHER FORECASTING** **(Credits: Theory-03)** **Theory: 30 Lectures**
Code	PHYS309TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory:** Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Skill**: Project File or Dissertation Record + Seminar = **5+5 marks.**	

Part B - WEATHER FORECASTING SKILL EXAM – SEC4

Name of the Course	**PHYSICS-SEC4: WEATHER FORECASTING SKILL**

(9 Lectures)

Measuring the weather: Wind; forces acting to produce wind; wind speed direction: units, its direction; measuring wind speed and direction; humidity, clouds and rainfall, radiation: absorption, emission and scattering in atmosphere; radiation laws.

(4 Lectures)

Weather systems: Global wind systems; air masses and fronts: classifications; jet streams; local thunderstorms; tropical cyclones: classification; tornadoes; hurricanes.

(3 Lectures)

Climate and Climate Change: Climate: its classification; causes of climate change; global warming and its outcomes; air pollution; aerosols, ozone depletion, acid rain, environmental issues related to climate. **(6 Lectures)**

Basics of weather forecasting: Weather forecasting: analysis and its historical background; need of measuring weather; types of weather forecasting; weather forecasting methods; criteria of choosing weather station; basics of choosing site and exposure; satellites observations in weather forecasting; weather maps; uncertainty and predictability; probability forecasts.

(8 Lectures)

Demonstrations and Experiments:

1. Study of synoptic charts & weather reports, working principle of weather station.
2. Processing and analysis of weather data:

(a) To calculate the sunniest time of the year.
(b) To study the variation of rainfall amount and intensity by wind direction.
(c) To observe the sunniest/driest day of the week.
(d) To examine the maximum and minimum temperature throughout the year.
(e) To evaluate the relative humidity of the day.
(f) To examine the rainfall amount month wise.

3. Exercises in chart reading: Plotting of constant pressure charts, surfaces charts, upper wind charts and its analysis.
4. Formats and elements in different types of weather forecasts/ warning (both aviation and non aviation)

Reference books:

cxii. PHYSICS-SEC4: WEATHER FORECASTING PHYSICS-SEC4: WEATHER FORECASTING

3rd Year

Part A - RENEWABLE ENERGY AND ENERGY HARVESTING - SEC4

Name of the Course	**PHYSICS-SEC4: RENEWABLE ENERGY AND ENERGY HARVESTING** **(Credits: Theory-03)** **Theory: 30 Lectures**
Code	PHYS310TH
Yearly Based Examination	**50 marks (3 Hrs)**
Continuous Comprehensive Assessment (CCA)	**30 marks**
CCA: Based on Midterm Exam, Class Test/Seminar/Assignments/Quiz and Attendance: **CCA Theory:** Midterm Exam = **10 marks,** Class Test/Seminar/Assignments/Quiz = **05 marks,** Attendance Theory = **05 marks. CCA Skill**: Project File or Dissertation Record + Seminar = **5+5 marks.**	

Part B - RENEWABLE ENERGY AND ENERGY HARVESTING SKILL EXAM – SEC4

(3 Lectures)

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.

(6 Lectures)

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

(3 Lectures)

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies. Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.

Geothermal Energy: Geothermal Resources, Geothermal Technologies.

(7 Lectures)

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources.

(2 Lectures)

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power

(4 Lectures)

Electromagnetic Energy Harvesting: Linear generators, physics mathematical models, recent applications, Carbon captured technologies, cell, batteries, power consumption, Environmental issues and Renewable sources of energy, sustainability.

(5 Lectures)

Demonstrations and Experiments

1. Demonstration of Training modules on Solar energy, wind energy, etc.
2. Conversion of vibration to voltage using piezoelectric materials
3. Conversion of thermal energy into voltage using thermoelectric modules.