Guidelines for PhD Admission 2026-27

Doctor of Philosophy (PhD)

Chinmaya Vishwa Vidyapeeth
Deemed to be University

Adi Sankara Nilayam, Adi Sankara Marg, Veliyanad

Ernakulam – 682313, Kerala, India

1. Preamble

Chinmaya Vishwa Vidyapeeth (Deemed to be University) is committed to advancing research and higher education through the integration of Indian Knowledge Systems (IKS) with contemporary academic disciplines. The Ph.D. programme represents the highest level of academic engagement, aimed at encouraging original research, interdisciplinary inquiry, and socially relevant scholarship. In alignment with the latest regulations of the University Grants Commission, these guidelines provide a structured framework ensuring academic excellence, ethical research practices, and quality standards while promoting a supportive research environment.

2. Admission

The admission is open for the following disciplines and sub-fields:

Disciplines with # Areas / Fields
***Interdisciplinary Research on Indian Knowledge Systems (IKS) with:** ▪ Psychology ▪ Languages ▪ Education ▪ Computing ▪ Artificial Intelligence and Machine Learning ▪ Material Science ▪ Mathematics ▪ Commerce and Economics ▪ Management, Leadership and HR ▪ Consciousness Studies & Vedanta ▪ Music
Commerce & Management ▪ Corporate Governance, Corporate Social Responsibility (CSR), Business Ethics, and Social Accountability ▪ Finance and Accounting: Financial Analysis, Investment Management, Corporate Finance, Corporate Taxation, International Taxation, Wealth Management, Cost and Management Accounting, Financial Regulations and Compliance ▪ Sustainable and Green Finance: Green Finance, Sustainable Finance, Behavioral Finance, Banking and Insurance ▪ Management and Strategy: Strategic Management, Leadership, International

Finance

- Human Resource and Organizational Studies: Human Resource Management, Organizational Behaviour, Occupational Psychology
- Marketing and Business Practices: Marketing Management, Innovative Business Practices
- Rural and Development Studies: Rural Studies, Sustainable Development

Sanskrit(Darsana, Sanskrit Literature, Aesthetics & Poetics in Sanskrit, Sanskrit Manuscriptology) Sanskrit Grammar - Paninian Studies

- Darsana - Sankhya Darsana, Yoga Darsana
- Sanskrit Literature - Vedic Literature, Classical Literature, Modern Literature
- Aesthetics & Poetics - Rasa Studies, Alankara Studies
- Manuscriptology - Critical edition of unpublished Sanskrit manuscripts

Hindi

- Hindi Language and literature
- Hindi journalism and media studies

English

- Children's literature, ritualistic studies and folktale and legend literature

Engineering and Technology

- Artificial Intelligence and Data Science: Artificial Intelligence, Machine Learning, Deep Learning, Data Mining, Optimization, Health Informatics, and Development of New Applications.
- Security and Privacy
- Algorithms and Nature-Inspired Computing
- Natural Language Processing: Natural Language Processing, Semantics, and Computational Linguistics.
- Image Processing and Computer Vision
- Electronics and Embedded Systems: VLSI, Semiconductor Devices, Nanoelectronics, Internet of Things (IoT), Carbon Nanotubes (CNT), FinFETs, Robotics, and Automation.
- Advanced Materials and Biomedical Engineering: Composite Materials, Nanomaterials, Biomaterials, Plasma Surface Modification, Tissue Engineering, and Regenerative Medicine.

Engineering Sciences

- Biotechnology, Bioinformatics, Materials science, Life sciences

Education

- Educational Psychology, Educational Management and Administration
- Education- Environmental Studies, Sociology pedagogy

▪ Education, English Language Teaching & Learning, and Education Technology ▪ Mathematics Education
Physics ▪ Photonics, Nonlinear optics, Nanomaterials, Metamaterials
Mathematics ▪ Graph theory, Optimization ▪ Analytic Number Theory (Mainly, elementary arithmetic functions, Ramanujan sums and its generalization) ▪ GCD sum identities, Asymptotic formulas related to Ramanujan sum and related problems
Psychology ▪ Social Psychology, Organizational Behaviour, Counselling Psychology, Cognitive Psychology
Music ▪ Hindustani Music – Tabla ▪ Hindustani Classical Music ▪ Musicology ▪ Literature and Music ▪ Folk Music ▪ Ethnomusicology

** Suitable candidates will be eligible for fellowships.*

 # The listed areas/fields are indicative and not exhaustive. Other related areas, subject to approval of the School/ Department/ Centre Selection Committee will also be considered.

3. Eligibility for Admission

The Ph.D. Programme shall be offered under the following categories, subject to the availability of approved Research Centres, recognised Research Supervisors, and requisite infrastructure in the concerned discipline:

1. Full-Time Research Scholar

A Full-Time Research Scholar is a candidate who:

- Is registered for the Ph.D. programme on a full-time basis; and
- Carries out research work primarily at the University campus or its approved Research Centres.

2. Part-Time Research Scholar

A Part-Time Research Scholar is a candidate who:

- Is employed in an organisation such as a Research Institution, Educational Institution, Industry, or other organisation recognised by the University; and
- Is permitted to pursue the Ph.D. programme on a part-time basis, subject to the approval of the University.

  Part-Time Research Scholars shall:
- Fulfil the minimum residency requirements as prescribed by the University;
- Submit a No Objection Certificate (NOC) from the employer at the time of application and prior to admission;
- Ensure availability of adequate time and facilities for pursuing research.

Provided that, the minimum residency requirement may be waived or suitably relaxed for candidates working within a radius of 100 km from the University campus, subject to approval by the competent authority.

The following are eligible to seek admission to the PhD programme.

(i) Candidates who have completed 1-year/2-semester master's degree programme after a 4-year/ 8-semester bachelor's degree programme or a 2-year/4-semester master's degree programme after a 3-year bachelor's degree programme or qualifications declared equivalent to the master's degree by the corresponding statutory regulatory body, with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed.

(ii) Candidates who have completed a 4-year/8-semester bachelor's degree programme should have a minimum of 75% marks in aggregate or its equivalent grade on a point scale wherever the grading system is followed. These candidates shall be considered as Direct Admission to PhD programmes after their UG degree.

(iii) Candidates who have completed the M.Phil. programme with at least 55% marks in aggregate or its equivalent grade in a point scale wherever grading system is followed.

(iv) For international students, the candidate must submit well-documented proof that the qualifying for a master's degree earned by him/ her in the international university, is equivalent to that of an Indian master's degree from Association of Indian Universities and/ or Internal Committee constituted by the University for this purpose. The international students from the non-English speaking countries need to undergo a 3-month bridge programme in English Language before they start their research work in the university.

(v) For part-time research scholars, an NOC from employing organization regarding the candidate's registration for PhD programme at CVV is required to be submitted at the time of application and certainly before the admission to the said programme in the university.

(vi) A relaxation of 5% marks or its equivalent grade may be allowed for those belonging to SC/ST/OBC (non-creamy layer) /Differently Abled, Economically Weaker Section (EWS) and other categories of candidates as per the decision of the Commission from time to time.

4. Admission Process

(i) The candidate must apply online for admission to PhD program using link available on the CVV website.

Refer: **https://www.cvv.ac.in/study-program/doctoral-phd-programmes**

(ii) The selection of candidates for the Ph.D. programme is carried out through a two-stage admission process.:

- In the first stage, an entrance test will be conducted. The test could be descriptive or MCQ or a combination of both as mandated by the school/department/centre. 50% weightage will be given to research methodology and the rest 50% to core/discipline specific subjects. For a candidate with inter-disciplinary background, the subject specific portion will be decided by the school/department/centre accordingly. Candidates must secure at least 50% marks in the entrance test to become eligible for the interview.

  Note: Candidates who have qualified UGC-NET (Lectureship)/ CSIR - NET, valid GATE scores are exempted from the entrance test.

- In the second stage, candidates will be called for a personal interview.The Selection Committee will decide on the number of eligible candidates to be called for an interview as follows:

  a) An interview will be conducted where the candidates are required to discuss their research interests/areas through a presentation before the committee.

  b) The interview should also consider the following aspects, viz. whether:

  - ❖ The candidate possesses competence for the proposal research
  - ❖ The research work can be suitably undertaken
  - ❖ The basic knowledge related to proposed area of research.
  - ❖ The candidate's motivation for research.
  - ❖ The merit list for the selection will be prepared based on candidate's marks in previous degrees, performance in the entrance test and interview. The weightage may vary from

school to school or department to department or centre to centre. Wherever entrance test is exempted, its weightage will be added to the weightage of Interview component.

- ❖ The list of selected candidates will be published on the university website

5. Duration of the Programme

(i) Ph.D. programme shall be for a minimum duration of three (3) years, including course work, and a maximum duration of six (6) years from the date of admission to the Ph.D. programme.

(ii) A maximum of an additional two (2) years can be given through a process of re-registration as per the rules and regulations of the Higher Educational Institution concerned; provided, however, that the total period for completion of a Ph.D. programme should not exceed eight (8) years from the date of admission in the Ph.D. programme.

(iii) Provided further that, female Ph.D. scholars and Persons with Disabilities (having more than 40% disability) may be allowed an additional relaxation of two (2) years; however, the total period for completion of a Ph.D. programme in such cases should not exceed ten (10) years from the date of admission in the Ph.D. programme.

(iv) Female Ph.D. Scholars may be provided Maternity Leave/Child Care Leave for up to 240 days in the entire duration of the Ph.D. programme.

6. Course Work

Each student admitted to the PhD programme shall be required to undertake coursework in their first year at CVV. The guidelines regarding the minimum credit requirements are given below.

Table 1: Minimum Credit Requirements for the PhD Programme coursework

Sl. No	Qualification	Minimum Credit requirement	Remarks
1	2-year master's degree programme after a 3-year bachelor's degree programme for Science, Arts, Humanities, Social Sciences, and Management	16 credits	The course work is expected to be completed during the first two semesters and in any case, not more than 18 months from the date of joining.

	Studies.		
2	2-year master's degree programme after a 4-year bachelor's degree programme for all the programmes	16 credits	The coursework is expected to be completed during the first two semesters and in any case, not more than 18 months from the date of joining.
3	1-year master's degree programme after a 4-year bachelor's degree programme for Engineering	18 credits	The course work is expected to be completed during the first three semesters and in any case, not more than 24 months from the date of joining.
4	4-year bachelor's degree programme (Direct Admissions)	24 credits	

(i) The coursework should include three mandatory courses, namely, IKS- The Art of Man making (2 credits), Research Methodology (4 credits) and Research and Publication Ethics (2 credits). The Research Advisory Committee can also recommend UGC recognized online courses (pertinent to the thesis theme) as part of the credit requirements for the PhD programme.

(ii) A PhD scholar must obtain a minimum of 55% marks or its equivalent grade in the UGC 10-point scale in the coursework to be eligible to continue in the programme and submit his/her thesis

(iii) All courses shall be of Post graduation or Equivalent level and will largely be related to PhD research to advance his/her knowledge in the area of research chosen.

(iv) The Research Advisory Committee may also recommend additional courses over and above the minimum requirements.

(v) The PhD course work may be offered as a Regular/ self-study course.

- **Regular Course:** Regular course is the course offered by the university in their PG/ PhD curriculum and evaluation of the course is followed as per the curriculum.
- **Self- study Course:** If the proposed course is not offered by the university across the programmes, then the Self-Study course is done under the guidance of the supervisor or other faculty from the university. The syllabus of the self-study course shall be duly approved by the BOS of School/Department/Centre and the Academic Council.

(vi) All PhD scholars, irrespective of any discipline, shall be required to be trained in teaching /education /pedagogy/writing related to their chosen PhD subject during their doctoral period.

(vii) PhD scholars may also be assigned 4-6 hours per week of teaching/research assistantship for conducting tutorials or laboratory work and evaluations of UG and PG programmes.

(viii) Based on the performance in each course, at the end of the semester, a student is awarded a final letter grade point.

7. Research Advisory Committee and its Functions

(i) There shall be a Research Advisory Committee (RAC) for each PhD scholar. For each registered PhD research scholar (both full-time and part-time), the constitution of a Research Advisory Committee duly approved by the Dean of Academic Affairs (DAA) on the recommendation of Head of the School/Department/Centre shall be as follows:

- An internal expert recommended by the Supervisor from same department,
- An external expert in the allied areas of research from another department or other School of CVV or other institutions outside CVV,
- The Co-supervisor, if any,
- The Supervisor – Convener

(ii) Both internal and external experts would be selected by the DAA from a panel of three experts against each category submitted by the supervisor.

(iii) In the case of inter-disciplinary research, the internal experts may be drawn from synergy schools/departments/centers.

(iv) The functions of the RAC will be as follows:

- To review the research proposal and finalize the topic of research,
- To guide the research scholar in developing the study design and methodology of research and identify the course(s) that he/she may have to do,
- To periodically review and assist in the progress of the research work of the research scholar,
- To recommend change of status from full-time to part-time to SRC/ DRC/CRC
- To recommend change of supervisor to SRC/ DRC/CRC
- To recommend any leave for field work/laboratory work outside CVV
- Any other academic activity related to PhD research

(v) Each semester, a research scholar shall appear before the RAC to make a presentation and submit a brief report on the progress of his/her work for evaluation and further guidance.

The RAC Committee shall submit its recommendations along with a copy of research scholars progress report to the Associate Dean/Assistant Dean - Doctoral Programme. A copy of such recommendations shall also be provided to the research scholar. The first RAC meeting must be conducted within one month from the date of registration of the scholar.

(vi) In case the progress of research scholars is not satisfactory, the RAC Committee shall record the reasons for the same and suggest corrective actions. If the research scholar fails to implement these corrective measures, the RAC may recommend, for specific reasons, the cancellation of the registration of the research scholar from the PhD programme.

(vii) The minutes of meetings of all the RAC will be submitted to Office of DAA by the Supervisor for records in the personal files of research scholar.

8. Annual PhD Programme Fee Structure*

PhD (Full time)	₹ 60,000 / Annum
PhD (Part time)	₹ 1,20000 / Annum

**All Ph.D. scholars are eligible for a 50% CVV Research Scholarship*

Appendix

Syllabus for the PhD Entrance Examination

PART I – RESEARCH METHODOLOGY (50 Marks)

(Common to all Disciplines except Sanskrit)

Module I	**Meaning of Research:** Objectives of Research, Types of Research, Research Process, Problem Statement, Research Design, Approaches to Research-Quantitative, Qualitative Approach, Exploratory, Confirmatory Research, Experimental and Theoretical Research.
Module II	**Problem Formulation:** Conducting Literature Review, Information Sources (Books, monographs, reviews, blogs, etc.), Information Retrieval, Role of libraries in Information Retrieval, Tools for identifying literature (digital resources and print media), Indexing and abstracting services, Citation indexes, Summarising the Review, Critical Review, Identifying Research Gap, Conceptualizing and Hypothesizing the research gap.
Module III	**Research Design:** Experimental / Simulation/ Theoretical /Empirical Research, Cause effect relationship, Development of Hypothesis, Measurement Systems Analysis, Validity and Reliability, Statistical Design of Experiments, Field Experiments, Data/Variable Types & Classification, Data collection - Methods and Tools.
Module IV	**Data Analysis and Interpretation:** Sampling, Sampling Error, Statistical Methods/Tools - Measures of Central Tendency and Variation, Test of Hypothesis- z test, t test, F test, ANOVA, Chi square, correlation and regression analysis, Error Estimation.
Module V	**Writing Research Articles and Thesis:** Data Presentation- Types of tables and illustrations, Guidelines for writing the abstract, introduction, methodology, results and discussion, conclusion sections of a manuscript. References – Styles and methods, Citation and listing system of documents. Plagiarism. Ethical considerations in Research.

PART I - RESEARCH METHODOLOGY (50 Marks)

(*Only for Sanskrit*)

Module I	Scope and objectives of research in Sanskrit – Definition of research - Methods Traditional – Scientific – Historical – Philological – Difference among research papers – dissertation and thesis – Tantrayukti General qualifications for research - Anubandhacatuṣṭaya Proficiency in the field - Heuristic motivation Reflective ability - Special qualifications - Capacity for high degrees of generalisation - Language of source - Language of reporting Basic types - Thinker or Text based topics - concept based - comparative - meta-philosophical - inter- disciplinary – multi-disciplinary – guiding principles in choosing a topic - scope for original contribution - literature review - developing a research question - formulating a topic - preliminary synopsis – abstract Meaning of critical edition - materials required - fixing the definitive reading - collation – equipment for a critical editor - Textual criticism - Literary criticism - different schools of alaṅkāra Form of a thesis - title page - preface – acknowledgments table of contents - abbreviations - introduction - chapters - conclusion - appendices - bibliography - notes - illustrations - pagination -quotations - transliteration - common scholarly abbreviations - style - plagiarism.
References	*1.Lele, W K. (2006). Methodology of Ancient Indian Sciences. The Chaukhamba Surabharati Studies No.5. Varanasi: Chaukhamba Surabharati Prakashan.* *2. Dash, Keshab Chandra. (1992). Elements of Research Methodology in Sanskrit. Varanasi: Chaukhambha Sanskrit Sansthan.* *3. Shivaganesha Murthy, R S (1996). Introduction to Manuscriptology. Delhi: Sharada Publishing House.* *4. Katre, S M (1954). Introduction to Indian Textual Criticism. Deccan College Hand Book Series Poona: Deccan College* *5. Acharya, Sathyanarayana. (2005). Samskṛta śodha pravidhiḥ, Odisha.*

Part II – INTERDISCIPLINARY / DISCIPLINE SPECIFIC (50 Marks)

1	**INTERDISCIPLINARY RESEARCH INTEGRATING INDIAN KNOWLEDGE SYSTEMS WITH PSYCHOLOGY/ COMMERCE/MATHEMATICS/ EDUCATION/ ENGLISH/ MUSIC AND OTHER DISCIPLINES**
Module I	**Introduction to Indian Knowledge Traditions & Systems:** Overview of Indian Knowledge Traditions & Systems (IKT & IKS), introduction to various domains in ancient India including engineering and technology, town planning and architecture, mathematics, astronomy, surgery, wellness and psychology, governance and public administration, trade and commerce, detailed exploration of one or more examples from the above domains, mapping of these examples to their corresponding body of knowledge in IKT/IKS, understanding and definition of the IKS corpus.
Module II	**Science & Technology:** Advances and achievements of ancient India in astronomy, architecture, chemistry, metallurgy and mathematics.
Module III	**Commerce, Public Administration & Governance:** Teachings from *Arthaśāstra* authored Kauṭilya**.**
Module IV	**The Essence of Indian Knowledge Traditions & Systems** Unique features and insights of Indian Knowledge Traditions & Systems, nature and source of knowledge, various branches of knowledge, means to knowledge, mindset required to acquire and facilitate knowledge, universal application of knowledge transcending space and time.
References	*Introduction to Indian Knowledge System: Concepts and Applications authored by Prof B Mahadevan, Dr. Vinayak Rajat Bhat and Dr. Nagendra Pavana R. N*

2	**COMMERCE & MANAGEMENT**
Module I	**General Management:** Principles and functions of management, organizational structure, responsibility and authority, motivation and leadership, corporate governance, and business ethics;

	planning, decision-making, organization, motivation, leadership, organizational structure, and organizational culture. **Human Resource Management:** Performance appraisal, including 360-degree performance appraisal, collective bargaining, and workers' participation in management; HR planning, recruitment, selection, job description, job analysis, job specification, and training & development, CSR, Corporate Governance. **Marketing Management:** Marketing mix, product decisions, pricing decisions, promotion decisions, distribution decisions, market segmentation, targeting & positioning, product life cycle, and consumer behavior. **Financial Management:** Basic concepts of financial management, time value of money, capital structure, capital budgeting, cost of capital management, working capital management, and risk and return analysis- Types of markets- Security Analysis and portfolio Management - Behavioural Finance concepts and Theories **Organisational Behavior:** Individual behaviour and processes. Group behaviour and dynamics – organisational process and structure
Module II	**General Accounting and Auditing:** Basic accounting standards and principles, journal and ledger entries, final accounts (Trading, P&L, and Balance Sheet), partnership accounts, ratio analysis, cash flow analysis; financial statements analysis, Indian Accounting Standards, IFRS, auditing, and recent trends in auditing. **Cost & Management Accounting:** Concepts of different costs, elements of costs, break-even- point analysis, marginal costing, standard costing, and budgetary control.
Module III	**Banking and International Business:** National income, inflation, business cycle, foreign trade, business environment and policy framework in India, international business, balance of payments, types of banks and their functions, role of RBI, SEBI,

	NABARD, and rural banking; e-banking, financial institutions, financial regulators, and banking sector reforms.
Module IV	**Quantitative Techniques:** Parametric Tests-F, Ratio-One Way ANOVA-Two Way ANOVA-Non-Parametric Tests-Chi-Square-Test-Sign –Test-Woilcoxen Signed Test- Mann- Whitney U Test-Kruskal Wallis H Test- Kolmogorov Smirnov Test- Structural Equation Modelling – Focuses on statistical methods including parametric and non- parametric tests.
References	*1. Stephen P. Robbins, S. P., & Judge, T. A. Organizational behavior (17th ed.). Pearson.* *2. Arihant Experts. NTA UGC NET/JRF/SET commerce (Paper 2). Arihant Publications* *3. Atlantic Research Division. Commerce for UGC-NET/SLET and other competitive examinations. Atlantic Publishers & Distributors* *4. K. Aswathappa, K. Human resource management: Text and cases (8th ed.). McGraw Hill Education.* *5. T. N. Chhabra, T. N. Human resource management: Concepts and issues. Dhanpat Rai & Co.* *6. M. Y. Khan, M. Y., & Jain, P. K. Financial management: Text, problems and cases (8th ed.). McGraw Hill Education.* *7. R. P. Rustagi, R. P.. Financial management: Theory, concepts and problems. Taxmann Publications.* *8. Philip Kotler, P., & Keller, K. L. Marketing management Pearson.* *9. S. P. Gupta, S. P., & Gupta, M. P.. Business statistics. Sultan Chand & Sons.*

3	ENGINEERING SCIENCES (MATERIALS SCIENCE)
Module I	**Structure and Properties of Materials -**Atomic structure and bonding (ionic, covalent, metallic, van der Waals), Crystal structures and defects (point, line, surface defects), Mechanical, thermal, electrical, and magnetic properties
Module II	**Advanced Materials - Composite materials:** types, interfaces, and

	applications, Nanomaterials: synthesis, properties, and characterization, Biomaterials: classification, biocompatibility, and applications, Smart and functional materials (shape memory alloys, piezoelectric materials)
Module III	**Materials Processing and Manufacturing - Conventional processing:** casting, forming, powder metallurgy, Processing of polymers (injection molding, extrusion, blow molding), Thin film deposition techniques (CVD, PVD), Additive manufacturing (3D printing of materials)
Module IV	**Characterization Techniques - Microscopy**: Optical microscopy, SEM, TEM, Spectroscopy: XRD, FTIR, UV-Vis, Thermal analysis (DSC, TGA, DMA for polymers), Mechanical testing (tensile, hardness, fatigue, viscoelastic behavior of polymers)
Module V	Functional and Emerging Material Applications - Surface engineering/functionalisation/coating techniques, Materials for energy applications (batteries, fuel cells, solar cells), Materials for biomedical applications: - Tissue Engineering (scaffolds, biomaterials interaction), Regenerative Medicine. Sustainable and green materials.
References	*1.Callister, W. D., & Rethwisch, D. G. (2018). Materials science and engineering: An introduction (10th ed.). Wiley.* *2.Gowariker, V. R., Viswanathan, N. V., & Sreedhar, J. (2019). Polymer science (3rd ed.). New Age International Publishers.* *3.Raghavan, V. (2015). Materials science and engineering: A first course (6th ed.). Prentice Hall of India.* *4.Pradeep, T. (2017). Nano: The essentials –Understanding nanoscience and nanotechnology. McGraw-Hill Education (India).* *5. Leclerc, M., & Gauvin, R. (Eds.). (2014). Functional materials: For energy, sustainable development and biomedical sciences. De Gruyter*

4	**ENGINEERING SCIENCES (BIOTECHNOLOGY, BIOINFORMATICS, LIFE SCIENCES)**
Module I	**Fundamentals of Biological Systems -** Cell Theory, Cell ultra-structure, Classical and Molecular Taxonomy, Biomolecules: Proteins, nucleic acids, lipids, carbohydrates, Metabolic pathways in

	animal and plant cells. Mendelian genetics and genetic regulations (epigenetics, epistasis)
Module II	**Biotechnology -** Basic principles of Biotechnology and Molecular biology. Recombinant DNA technology in animals, plants, and microorganisms and its applications.Bioprocess engineering, Biomedical devices, sensors and lab on a chip
Module III	**Bioinformatics -** Principles and tools for nucleotide sequence alignment, evolutionary analysis and protein structure prediction. Genomics, proteomics and microarray analysis Databases, relevant file formats, and basics of systems biology. Basics of programming language - python, R, C++, and statistical tools.
References	*1.Alberts, B., Heald, R., Johnson, A., Morgan, D., Raff, M., Roberts, K., & Walter, P. (2022). Molecular Biology of the Cell (7th ed.). W. W. Norton & Company.* *2.Nelson, D. L., & Cox, M. M. (2021). Lehninger Principles of Biochemistry (8th ed.). W. H. Freeman.* *3.Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Orr, R. B. (2020). Campbell Biology (12th ed.). Pearson.* *4.Glick, B. R., & Patten, C. L. (2022). Molecular Biotechnology: Principles and Applications of Recombinant DNA (6th ed.). ASM Press.* *5.Doran, P. M. (2012). Bioprocess Engineering Principles (2nd ed.). Academic Press.* *6.Primrose, S. B., & Twyman, R. M. (2006). Principles of Gene Manipulation and Genomics (7th ed.). Blackwell Publishing.* *7.Saltzman, W. M. (2015). Biomedical Engineering: Bridging Medicine and Technology (2nd ed.). Cambridge University Press.* *8.Pevsner, J. (2015). Bioinformatics and Functional Genomics (3rd ed.). Wiley-Blackwell.* *9.Xiong, J. (2006). Essential Bioinformatics. Cambridge University Press.* *10.Klipp, E., Liebermeister, W., Wierling, C., & Kowald, A. (2016). Systems Biology: A Textbook (2nd ed.). Wiley-VCH.* *11.Buffalo, V. (2015). Bioinformatics Data Skills: Reproducible and*

	Robust Research with Open-Source Tools. O'Reilly Media.

5	**ENGINEERING AND TECHNOLOGY (COMPUTER SCIENCE & ENGINEERING)**
Module I	**Mathematics - Linear Algebra:** Matrices, determinants, eigenvalues, eigenvectors, vector spaces, and linear transformations. Probability and Statistics: Basics of probability theory, random variables, distributions, statistical inference. Calculus: Limits, continuity, differentiation. Discrete Mathematics: Set theory, graph theory, logic, combinatorics, recurrence relations, and Boolean algebra.
Module II	**Algorithms and Data Structures - Data Structures:** Arrays, linked lists, stacks, queues, trees, graphs, heaps, and hash tables. Algorithms: Sorting and searching algorithms, dynamic programming, greedy algorithms, divide and conquer, backtracking, graph algorithms (shortest paths, MST), and Time and Space Complexity of algorithms.
Module III	**Operating Systems - Process Management:** Process synchronization, scheduling algorithms, deadlock. Memory Management: Virtual memory, paging, segmentation. Disk scheduling. Concurrency: Threads, inter-process communication, semaphores, monitors.
Module IV	**Computer Networks - Network Protocols and OSI Model:** Layers (physical, data link, network, transport, session, presentation, application), TCP/IP. Routing and Switching: IP addressing, subnetting, routing algorithms.
Module V	**Database Management Systems (DBMS) - Data Models:** Relational, hierarchical, network models. SQL: Queries, joins, subqueries, triggers, views. Normalization: Normal forms (1NF to 5NF), functional dependencies. Transaction Management: ACID properties, concurrency control, recovery techniques.
Module VI	**Software Engineering - Software Development Life Cycle (SDLC):** Waterfall, Agile, and other methodologies. Software Design: UML diagrams, design patterns, modularization, and cohesion. Testing: Unit testing, integration testing, system testing, black-box and white-box testing.
Module VII	**Artificial Intelligence and Machine Learning - Machine Learning**

	Fundamentals: Supervised, unsupervised, and reinforcement learning. Algorithms: Decision trees, neural networks, support vector machines, k-means clustering. AI Concepts: Knowledge representation, search algorithms, logic, planning.
Module VIII	**Computer Architecture - Digital Logic:** Boolean functions, logic gates, combinational and sequential circuits. Processor Design: Instruction set architecture, microprocessors, RISC vs. CISC. Memory Hierarchy: Cache, main memory, virtual memory. Parallelism: Instruction-level parallelism, pipelining, and multiprocessing basics.
Module IX	**Programming Languages -** Basics of C, Python, Java languages
References	*1. Sheldon Axler, Linear Algebra Done Right 2nd Edition, Springer* *2. Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2022). Introduction to Algorithms (4th ed.). MIT Press.* *3. Silberschatz, A., Galvin, P. B., & Gagne, G. (2018). Operating System Concepts (10th ed.). Wiley.* *4. Kurose, J. F., & Ross, K. W. (2021). Computer Networking: A Top-Down Approach (8th ed.). Pearson.* *5. Tanenbaum, A. S., & Wetherall, D. J. (2011). Computer Networks (5th ed.). Pearson Education.* *6. Silberschatz, A., Korth, H. F., & Sudarshan, S. (2019). Database System Concepts (7th ed.). McGraw-Hill.* *7. Sommerville, I. (2016). Software Engineering (10th ed.). Pearson.* *8. Russell, S., & Norvig, P. (2021). Artificial Intelligence: A Modern Approach (4th ed.). Pearson.* *9. Patterson, D. A., & Hennessy, J. L. (2021). Computer Organization and Design: The Hardware/Software Interface (6th ed.). Morgan Kaufmann.* *10. Kernighan, B. W., & Ritchie, D. M. (1988). The C Programming Language (2nd ed.). Prentice Hall.* *11. Schildt, H. (2021). Java: The Complete Reference (12th ed.). McGraw-Hill.* *12. Thareja, R. (2017). Python Programming Using Problem Solving Approach. Oxford University Press.*

6	ENGINEERING AND TECHNOLOGY (ELECTRONICS AND COMMUNICATION ENGINEERING)
Module I	Semiconductor Devices, Electronic Circuits Biasing , BJTs and MOSFETs, Amplifiers, Low & High frequency analysis, IC MOSFET, Oscillators; Analog ICs - A-D & D-A Convertors, Applications of Analog ICs; Digital Electronics - Combinatorial circuits and Sequential circuits.
Module II	Communication Line coding, amplitude modulation and demodulation, spectra of AM and FM, PCM, DPCM, digital modulation schemes: amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, TDMA, FDMA and CDMA
Module III	Basics Of Signals and Systems, Digital Signal Processing Fourier series and Fourier transform, DFT, FFT, Z-transform, digital filter design techniques; Digital image Processing- Spatial and Frequency domain techniques, image enhancement, Segmentation, Restoration, Compression techniques, Laplace transforms, Zeros, Poles, Stability, Gain Margin, Phase Margin
Module IV	Microprocessor and Micro Controller 8085 & 8086 Microprocessor architectures - Memory Interfacing and I/O interfacing; Embedded Systems – 8051 & PIC Microcontroller- Special Function Registers, Interfacing, PIC Development Tools and Programming; VLSI - FPGA architectures**.**
Module V	Low Power VLSI, Power Dissipation, Power Optimization, Low Power CMOS Circuits, Power Estimation, Synthesis and Software Design For Low Power
References	*1. R.L. & Nashelsky, L., Electronic Devices and Circuit Theory, 11th Edition, Pearson, 2021.* *2. Haykin, S., Communication Systems, 5th Edition, Wiley, 2009.* *3. Oppenheim, A.V., Willsky, A.S. & Nawab, S.H., Signals and Systems, 2nd Edition, Pearson, 2015.* *4. Gonzalez, R.C. & Woods, R.E., Digital Image Processing, 4th Edition, Pearson, 2018.*

	5. Gaonkar, R.S., Microprocessor Architecture, Programming and Applications with the 8085, 6th Edition, Penram International, 2013. *6. Mazidi, M.A., Mazidi, J.G. & McKinlay, R.D., The 8051 Microcontroller and Embedded Systems, 2nd Edition, Pearson, 2006.Boylestad* *7. Roy, K. & Prasad, S.C., Low-Power CMOS VLSI Circuit Design, 1st Edition, Wiley, 2000.*

7	**ENGINEERING AND TECHNOLOGY (MECHANICAL ENGINEERING)**
Module I	**Fundamental Engineering Sciences** **Mechanics of Materials -** Stress and strain (axial, shear), Mechanical properties of materials, Elastic and plastic behavior, Failure theories (maximum stress, strain, energy-based criteria) **Thermodynamics and Heat Transfer -** Laws of Thermodynamics, Properties of pure substances, Heat transfer mechanisms: conduction, convection, radiation **Fluid Mechanics -** Fluid properties (density, viscosity, surface tension), Fluid statics (pressure variation, manometry, buoyancy)
Module II	**Manufacturing and Design Tools** **Manufacturing and Industrial Engineering -** Manufacturing processes: casting, forming, machining, Non-traditional machining processes, Production planning and control, Quality control and optimization techniques **Design and Computational Tools -** CAD/CAM fundamentals, Finite Element Analysis (FEA) fundamentals
Module III	**Advanced Materials and Emerging Technologies -** Composite materials: types, properties, and applications, Nanomaterials: fundamentals and engineering applications, Biomaterials: classification and biomedical applications, Plasma surface modification techniques, Tissue Engineering: scaffold design and applications, Regenerative Medicine: principles and engineering perspectives
References	*1.Kalpakjian, S., & Schmid, S. R. (2014). Manufacturing engineering*

	and technology (7th ed.). Pearson Education. *2.Callister, W. D., & Rethwisch, D. G. (2018). Materials science and engineering: An introduction (10th ed.). Wiley.* *3.Budynas, R. G., & Nisbett, J. K. (2015). Shigley's mechanical engineering design (10th ed.). McGraw-Hill Education.* *4.Çengel, Y. A., & Ghajar, A. J. (2020). Heat and mass transfer: Fundamentals and applications (6th ed.). McGraw-Hill Education.* *5.Çengel, Y. A., & Boles, M. A. (2019). Thermodynamics: An engineering approach (9th ed.). McGraw-Hill Education.* *6. Çengel, Y. A., & Cimbala, J. M. (2018). Fluid mechanics: Fundamentals and applications (4th ed.). McGraw-Hill Education.* *7. Shames, I. H. (1997). Engineering mechanics: Statics and dynamics (4th ed.). Prentice Hall.* *8.Popov, E. P. (1999). Engineering mechanics of solids (2nd ed.). Prentice Hall.* *9.Timoshenko, S. P., & Goodier, J. N. (1970). Theory of elasticity (3rd ed.). McGraw-Hill*

8	**EDUCATION**
Module I	**Philosophical and Sociological Foundations of Education:** Meaning and Function of Educational Philosophy, Relationship of Education and Philosophy; Western schools of Philosophy: - Idealism, Realism, Naturalism, Pragmatism, and Existentialism with special reference to the concepts of reality, knowledge and values, their educational implications for aims, contents and methods of education. Contributions of Educational thinkers –Plato, Aristotle, Rousseau, John Dewey, Froebel, Montessori Indian Schools of Philosophy -–Sankhya, Yoga, Nyaya, Vaisheshika, Purva Mimamsa, and Uttara Mimamsa (Vedanta), and Buddhism with special reference to the concepts of reality, knowledge and values and their educational implications. Contributions of Indian Thinkers: - Gandhiji, Tagore Vivekananda, Aurobindo; Concept and Nature of Educational Sociology and Sociology of Education, Relationship of Sociology and Education. Education and Social Change: Meaning, Nature and Factors determining Social change;

	Constraints of social change in India: Caste, Ethnicity, class, language, religion and regionalism; Education and social stratification Education and Social Mobility; Education for Democracy, Socialism, National Integration and International Understanding: Education for equal i educational opportunities.
Module II	**Educational Psychology:** Relationship of Education and Psychology. Scope of Educational Psychology; Methods of Educational Psychology; Concept of Growth and Development, factors affecting growth and development, Individual differences and implications, Exceptional children – Gifted, Slow, Underachievers, CWSN; Personality and related concepts - Types and Trait Theories; Assessment of Personality - Subjective and Projective Methods ; Maslow's hierarchy of needs; Creativity and related concepts, Intelligence and concepts, Theories:- Two Factor Theory (Spearman); Multi Factor Theory, Group Factor Theory, Guilford Model of Intellect, Multiple intelligences, Emotional Intelligence; Theories of Learning - Pavlov's Classical Conditioning, Thorndike's Associationism, Skinner's Operant Conditioning, Insight theory, Lewin's Field Theory, Gagne's Hierarchy of Learning, Constructivist theories of Piaget, Bruner and Vygotsky; Psychoanalytic theory, Concepts of Motivation, Achievement Motivation
Module III	**Research Methodology and Statistics in Education:** Nature and Scope of Educational Research; Scientific inquiry, scientific method, nature and sources of knowledge; Types of Research - Fundamental, Applied and Action Research; Process and Steps of Educational Research; Review of Related Literature; Hypothesis -types, and related concepts; Sampling, types, and related concepts, characteristics of a good sample; Variables - –types and related concepts, Characteristics of a good research tool; Descriptive Statistics -- Nature of educational data, Scales of measurement; Measures of Central Tendency: Mean, Median and Mode; Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation; Measures of Relative Position: Percentiles and Percentile Ranks; Inferential statistics- Null Hypothesis, Type I and Type II errors, one and two tailed tests ; use of t tests, ANOVA, Chi square, ANCOVA, regression analysis; Qualitative research and Mixed Method

	analysis; essentials of a Research report,
Module IV	**Contemporary Discussions in Education:** NEP 2020- School Education -General Overview, NEP -Higher Education; Multidisciplinarity, NEP and Research, Blended Learning, Flipped Learning and Hybrid Learning, AI Integrated classrooms; AI Integrated Techno-Pedagogical content Knowledge analysis, Competency enhancement- Hard skills, Soft skills and Life Skills; Values, Peace and Human right education; Value Crisis and factors of value crisis- Role of Family, Religion, Educational Institutions, Mass Media (print and Electronic), Social Media in value and peace education; Peace: Concept of peace and peace education, Aims and objectives of peace Education; Status of peace education in the curriculum , and importance of peace education -Sources of value education: Religious literature-Vedas, Bhagavad-Gita etc; Happiness education; Human rights and its relevance; Revamping Pre-Service and in-service Teacher Education; Concept of OBE, PO-CO Frameworks.
References	*1. Aggarwal, J. C. (2010). Foundations of education. New Delhi: Vikas Publishing House.* *2. Lal, R., & Sharma, R. K. (2011). Modern Indian thinkers on education. Meerut: R. Lall Book Depot.* *3.Chandra, S. S., & Sharma, R. K. (2004). Sociological foundations of education. New Delhi: Atlantic Publishers.* *4. Mangal, S. K. (2011). Psychology of learning and development. New Delhi: PHI Learning.* *5. Santrock, J. W. (2018). Life-span development (17th ed.). McGraw-Hill.* *6. Best, J. W., & Kahn, J. V. (2006). Research in education (10th ed.). New Delhi: Pearson.* *7. Garrett, H. E. (2005). Statistics in psychology and education. New Delhi: Paragon International, Government of India. (2020). National education policy 2020. Ministry of Education.* *8. Kumar, K. (2014). Teacher education in India. NCERT.*

9	PHYSICS
Module I	**Classical Mechanics:** Newtonian mechanics: Laws of motion, conservation laws, work and energy, Lagrangian and Hamiltonian formalisms: Principle of least action, symmetries, and conservation laws, Central force problems: Kepler's laws, scattering, and orbit theory, small oscillations and normal modes
Module II	**Electromagnetic Theory:** Solutions of electrostatic and magnetostatic problems conductors; magnetic materials; multipole expansion; Electromagnetic induction, Maxwell's equations; scalar and vector potentials; Coulomb and Lorentz gauges; electromagnetic waves in free space, non-conducting and conducting media; reflection and transmission at normal and oblique incidences; polarization of electromagnetic waves; Poynting vector, Poynting theorem, energy and momentum of electromagnetic waves; radiation from a moving charge.
Module III	**Mathematical Physics: Linear algebra:** Vectors, matrices, eigenvalues, and eigenvectors, Complex analysis: Complex numbers, analytic functions, contour integration, Differential equations: Ordinary and partial differential equations, boundary value problems, Fourier analysis and Laplace transforms, Special functions: Bessel, Legendre, Hermite, and Laguerre functions.
Module IV	**Quantum Mechanics:** Postulates of quantum mechanics; uncertainty principle; Schrodinger equation; Dirac Bra-Ket notation, linear vectors and operators in Hilbert space; one dimensional potentials: step potential, finite rectangular well, tunneling from a potential barrier, particle in a box, harmonic oscillator; two and three dimensional systems: concept of degeneracy; hydrogen atom; angular momentum and spin; addition of angular momenta; variational method and WKB approximation, time independent perturbation theory.
Module V	**Statistical Mechanics and Thermodynamics:** Laws of thermodynamics, entropy, and free energies, Statistical ensembles: Microcanonical, canonical, and grand canonical ensembles, Quantum statistics: Bose-Einstein and Fermi-Dirac distributions, Phase transitions: Classification, critical phenomena, and mean-field theories, Blackbody radiation, Debye theory of solids, and Bose-Einstein condensation.

References	*1.Classical Mechanics, Herbert Goldstein, Charles P. Poole, John L. Safko, (3rd ed) Pearson Education, 2002* *2.Introduction to Electrodynamics,David J. Griffiths, (4th ed.) Cambridge University Press, 2017* *3.Mathematical Methods for Physicists, George B. Arfken, Hans J. Weber, Frank E. Harris, (7th ed.) Academic Press, 2012* *4.Introduction to Quantum Mechanics, David J. Griffiths, Darrell F. Schroeter, (3rd ed.) Cambridge University Press, 2018* *5.Principles of Quantum Mechanics, R. Shankar, (2nd ed.) Springer,2011* *6. Statistical Mechanics, R. K. Pathria, Paul D. Beale. (3rd ed.) Elsevier,2011* *7. Heat and Thermodynamics, Mark W. Zemansky, Richard H. Dittman, (7th ed.) McGraw-Hill Education,1997*

10	**MATHEMATICS**
Module I	**Analysis:** Elementary set theory, finite, countable and uncountable sets, Real number system as a complete ordered field, supremum, infimum, Sequences and series, convergence, limsup, liminf. Continuity, uniform continuity, differentiability, mean value theorem. Sequences and series of functions, uniform convergence. Riemann sums and Riemann integral, Improper Integrals. Monotonic functions, types of discontinuity, functions of bounded variation, Lebesgue measure, Lebesgue integral. Functions of several variables, directional derivative, partial derivative, derivative as a linear transformation, inverse and implicit function theorems. Metric spaces, compactness, connectedness. Normed linear Spaces. Spaces of continuous functions as examples.
Module II	**Linear Algebra:** Vector spaces, subspaces, linear dependence, basis, dimension, algebra of linear transformations. Algebra of matrices, rank and determinant of matrices, li near equations. Eigenvalues and eigenvectors, Cayley-Hamilton theorem. Matrix representation of linear transformations. Change of basis, canonical forms, diagonal forms, triangular forms, Jordan forms. Inner product spaces, orthonormal basis. Quadratic forms, reduction and

	classification of quadratic forms.
Module III	**Complex Analysis:** Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric and hyperbolic functions. Analytic functions, Cauchy-Riemann equations. Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem. Taylor series, Laurent series, calculus of residues. Conformal mappings, Mobius transformations.
Module IV	**Algebra:** Permutations, combinations, pigeon-hole principle, inclusion-exclusion principle, derangements. Fundamental theorem of arithmetic, divisibility in Z, congruences, Chinese Remainder Theorem, Euler's Ø-function, primitive roots. Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutation groups, Cayley's theorem, class equations, Sylow theorems. Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, principal ideal domain, Euclidean domain. Polynomial rings and irreducibility criteria. Fields, finite fields, field extensions, Galois Theory.
Module V	**Ordinary Differential Equations, Partial Differential Equations:** Existence and uniqueness of solutions of initial value problems for first order ordinary differential equations, singular solutions of first order ODEs, system of first order ODEs. General theory of homogeneous and nonhomogeneous linear ODEs, variation of parameters, Sturm-Liouville boundary value problem, Green's function. Lagrange and Charpit methods for solving first order PDEs, Cauchy problem for first order PDEs. Classification of second order PDEs, General solution of higher order PDEs with constant coefficients, Method of separation of variables for Laplace, Heat and Wave equations.
Module VI	**Numerical Analysis:** Numerical solutions of algebraic equations, Method of iteration and Newton-Raphson method, Rate of convergence, Solution of systems of linear algebraic equations using Gauss elimination and Gauss-Seidel methods, Finite differences, Lagrange, Hermite and spline interpolation, Numerical differentiation and integration, Numerical solutions of ODEs using Picard, Euler, modified Euler and Runge-Kutta methods.

References	*1. Rudin (2017). Principles of Mathematical Analysis. McGraw Education.* *2. Tom M. Apostol, Mathematical Analysis, Second Edition, Narosa 1974* *3. Sheldon Axler, Linear Algebra Done Right 2nd Edition, Springer* *4.. Ahlfors (2017). Complex Analysis. McGraw Hill Education.* *5. J A Gallian, Contemporary Abstract Algebra, 8thEdition, Cengage Learning* *6. Simmons G.F, Differential Equations with Applications and Historical Notes, Third Edition, CRC Press, 2017.* *7. Yehuda Pinchover and Jacob, An introduction to partial differential equations, Cambridge University Press, 2005* *8. Richard L. Burden and J. Douglas Faires, Numerical Analysis, Ninth Edition, Brooks/Cole, Cengage Learning.*

11	**PSYCHOLOGY**
Module I	**Foundations of Psychology** Historical Perspectives: Emergence of Psychology from Western and Eastern (Indian) perspectives. Schools of Psychology: Structuralism, Functionalism, Behaviourism, Gestalt, Psychoanalysis, Humanistic, Cognitive, and Evolutionary Psychology.
Module II	**Biological Basis of Behaviour** Neuroanatomy and Physiology: Structure and functions of neurons, nerve impulse propagation, and central and peripheral nervous systems. Brain and Behaviour: Major brain structures and their functions, neurotransmitters, and hormones. Genetics and Evolution: Structure of genes, protein synthesis, cell division, Mendelian and post-Mendelian developments, and behaviour genetics.
Module III	**Cognitive Psychology** Attention and Perception: Attention as Consciousness; Theoretical models of Attention; Inattentional blindness; Neglect and neurological explanation of attention. Sensory and perceptual processes. Memory: Models of memory; encoding, storage, and retrieval; Short-

	term (STM), Working memory, and Long-term memory (LTM); Visual memory. Thinking and Intelligence: Concepts, categories, decision making, and theories of intelligence and creativity. Language: Language development, acquisition, and the brain-cognition link; speech recognition and reading processes.
Module IV	**Learning Theories:** Classical and Operant conditioning Behavioural Learning Theorists -Thorndike, Guthrie, Hull and Gange Cognitive learning theorists - Kohler, Tolman and Bandura; Comparison between cognitive and behaviourist approaches.
Module V	**Developmental Psychology** Theories of Development: Piaget, Vygotsky, Erikson, and Kohlberg. Lifespan Development: Prenatal development, infancy, childhood, adolescence, adulthood, and aging. Social Development: Attachment and interpersonal social relationships.
Module VI	**Personality and Motivation:** Theories of Personality: Psychodynamic: Freud, Jung, Adler, Horney, Erikson. Humanistic/Existential: Fromm, Rogers, Maslow. Cognitive/Social-Cognitive: Kelly, Rotter, Bandura. Trait and Biological perspectives. Motivation and Emotion: Theories of motivation, emotion, stress, and coping mechanisms.
Module VII	**Social Psychology** Social Cognition: Attribution theories, attitudes, and the relationship between attitudes and behavior. Group Dynamics: Conformity, compliance, obedience, leadership, and group behavior. Interpersonal Processes: Attraction, love, aggression, prosocial behaviour, and altruism.
Module VIII	**Psychopathology** Classification: Knowledge of DSM-5 and ICD-10 criteria. Childhood Disorders: ADHD, Conduct Disorder, Anxiety/Depression, Autism, and Learning Disabilities. Adult Disorders: Anxiety, Somatoform, Dissociative, Mood disorders,

	Schizophrenia, Delusional disorders, and Personality disorders.
Module IX	**Psychotherapy and Counselling** Therapeutic Techniques: Psychoanalysis, Counterconditioning, Operant conditioning, and CBT (Beck, Ellis). Humanistic and Modern Approaches: Person-cantered, Gestalt, Family/Marital therapies, Yoga, and Holistic approaches. Counselling Applications: Individual and group techniques; career planning and life skills counselling.
Module X	**Psychological Testing and Assessment** Test Construction: Item development, validation, reliability, validity, and development of norms. Clinical Assessment: Assessment of cognitive functions, personality, deviance, and pathology. Types of Tests: Psychometric and projective approaches.
Module XI	**Emerging Areas in Psychology** Modern Applications: Positive Psychology, Health Psychology, Forensic Psychology, and Cyberpsychology. Technology in Psychology: The role of Artificial Intelligence (AI) and Machine Learning in psychological research and practice
References	*1. Anastasi, A., & Urbina, S. (2009). Psychological testing (7th ed.). Pearson.* *2. Barlow, D. H., & Durand, V. M. (2018). Abnormal psychology: An integrative approach (8th ed.). Cengage.* *3. Baron, R. A., Branscombe, N. R., & Byrne, D. (2018). Social psychology (14th ed.). Pearson.* *4. Beck, J. S. (2020). Cognitive behavior therapy: Basics and beyond (3rd ed.). Guilford Press.* *5. Berk, L. E. (2018). Development through the lifespan (7th ed.). Pearson.* *Carlson, N. R., & Birkett, M. A. (2021). Physiology of behavior (13th ed.). Pearson.* *6. Ciccarelli, S. K., & White, J. N. (2021). Psychology (6th ed.). Pearson.* *7. Cohen, R. J., Swerdlik, M. E., & Sturman, E. D. (2018). Psychological testing and assessment (9th ed.). McGraw-Hill.*

	8. Corey, G. (2020). Theory and practice of counseling and psychotherapy (10th ed.). Cengage Learning. *9. Cornelissen, R. M., Misra, G., & Varma, S. (Eds.). (2011). Foundations of Indian psychology (Vol. 1). Pearson.* *10. Feist, J., Feist, G. J., & Roberts, T. A. (2021). Theories of personality (10th ed.). McGraw-Hill.* *11. Goldstein, E. B. (2019). Cognitive psychology: Connecting mind, research, and everyday experience (5th ed.). Cengage.* *12. Griffiths, M. D. (2015). Cyberpsychology: The study of individuals, society, and digital technologies. Routledge.* *13. Hill, W. F. (2002). Learning: A survey of psychological interpretations (7th ed.). Allyn & Bacon.* *14. Kalat, J. W. (2019). Biological psychology (13th ed.). Cengage Learning.* *15. Lahey, B. B. (2017). Psychology: An introduction (12th ed.). McGraw-Hill.* *16. Myers, D. G., & Twenge, J. M. (2021). Social psychology (13th ed.). McGraw-Hill.* *17. Santrock, J. W. (2021). Life-span development (18th ed.). McGraw-Hill.* *18. Schultz, D. P., & Schultz, S. E. (2016). A history of modern psychology (11th ed.). Cengage Learning.* *19. Schultz, D. P., & Schultz, S. E. (2017). Theories of personality (11th ed.). Cengage.* *20. Schunk, D. H. (2020). Learning theories: An educational perspective (8th ed.). Pearson.* *21. Snyder, C. R., & Lopez, S. J. (Eds.). (2021). Positive psychology: The scientific and practical explorations of human strengths (4th ed.). Sage.* *22. Sternberg, R. J., & Sternberg, K. (2017). Cognitive psychology (7th ed.). Cengage Learning.*

12	**HINDUSTANI MUSIC (VOCAL/INSTRUMENTAL)**
Module I	**Technical-Terminology:** Nada, Shruti, Swara, Grama-Moorchana, Jati, Thata (Mela), Raga, Tana, Gamak, Gandharva, Gaan, Margi-Deshi, Giti,

	Nibaddha, Anibaddha, Varna, Alankar, Melody, Harmony, SwarSanwad, Musical Scales, Musical Intervals, Western and South Indian terminology and their explanation, Alpatva-Bahutva, Avirbhav-Tirobhav, Laya, Tala, Matra, Avartan, Vibhag, Theka, Kriti, Kirtana, Ragmalika, Tillana, Javeli, Maseetkhani and Rajakhani Gat.
Module II	**Applied Theory:** Detailed and critical study of Ragas, classification of Ragas, i.e. Grama Raga vargikaran, Mela Raga Vargikaran, Raga-Ragini Vargikaran, Thata Raga Vargikaran and RagangaVargikaran, Time-theory of Ragas, Application of melody and harmony in Indian Music, Placement of Shuddha and VikritSwaras on Shruties in ancient, medieval and modern period. Detailed knowledge of prevalent talas of Hindustani music, knowledge of tala Dashpranas and Margi and Deshitalas of ancient period.
Module III	**Compositional forms and their Evolution:** Prabandha, Dhrupad, Dhamar, Sadra, Khyal, Thumri, Tappa, Tarana, Chaturang, Trivat, Vrindagana, VrindaVadan.
Module IV	Gharanas and Gayaki Origin, development and contribution of Gharanas in preserving and promoting Hindustani classical music (Vocal-Instrumental).
Module V	Contribution of Scholars to Indian Music and the study of Important Granthas (treatises). Natya-Shastra, Brihaddeshi, Dattilam, Sangeet-Makarand, Geet-Govinda, Sangeet Ratnakar, Rag-Tarangini, Swara-Mela-Kalanidhi, Sadraga-Chandrodaya, Sangeet Raj, Sangeet-Parijat, Hridya Prakash, Chaturdandi Prakashika, Rag-Tatva-Vivodh, Raga-Darpan, Nagmat-eAsaphi, Bhatkhande Sangeet Shastra (Vol.1-4), Rag-Vigyan, Sangeetanjali, Sangeet Chintamani etc.
Module VI	**Historical Perspective of Music:** A study of the historical development of Hindustani music (Vocal, Instrumental). Contribution of Western Scholars to Indian Music.
Module VII	**Aesthetics:** Its origin, expression and appreciation: Principle of aesthetics and its relation to Indian Music. Rasa theory and its application to Indian Music. Relationship of Musical aesthetics and Rasa to Hindustani Music

	(Vocal, Instrumental). Inter-relationship of Fine Arts with special reference to Rag-Ragini Paintings; Dhyan of Ragas and others.
Module VIII	**Instruments:** Origin, development, material used and structure of various instruments and their well-known exponents of Hindustani Music (Vocal, Instrumental).
Module IX	**Folk Music:** General study of the folk music of various regions of India like Uttar Pradesh, Rajasthan, Haryana,Punjab, Maharashtra, Bengal and South India.
Module X	**Music Teaching and Research Methodology:** The methodologies of music research, preparing synopsis, data collection, field work, writing project reports, finding bibliography, Footnotes, reference material etc. with reference to Hindustani music.
Module XI	**Percussion Music (Tabla/Pakhawaj)** nd development of Percussion Music ents as per Musicological Texts (Tabla/Pakhawaj) • Knowledge of different Percussion Instrument Gharanas (Tabla/Pakhawaj) Detailed knowledge of own Instrument and a few other recognized percussion Instruments. • Knowledge of Musicology and rudiments of Instrumental, Percussion and Vocal Music.
References	*1. Vishnu Narayan Bhatkhande — Hindustani Sangeet Paddhati* *2. Vishnu Narayan Bhatkhande — Kramik Pustak Malika* *3. B. R. Deodhar — An Introduction to Indian Music* *4. B. R. Deodhar — Pillars of Hindustani Music* *5. Tabla Vadan – Kala Aur Shastra – Pt. Sudhir Mainkar* *6. Tabla – Pt. Arvind Mulgoankar* *7. Gharana of Pakhawaj and Tabla – Aban Mistri*

13	**SANSKRIT**
Module I	I Vedic-Literature & Sanskrit Literature, Poetics and Prosody **a) General Introduction of Vedic Literature:** · Main theories regarding the Vedās: Maxmüller; A.Weber; Jacobi; Balgangadhar Tilak; M.Winternitz; Indian traditional views. · Saṁhitā Literature ·

	Brāhamaṇa Literature · Āraṇyaka Literature · Śikṣā; Kalpa; Vyākaraṇa; Nirukta; Chandas; Jyotiṣa **b) General Introduction of the following:** Bhāsa, Aśvaghośa, kālidāsa, Śūdraka, Viśākhadatta, Bhāravi, Māgha, Harṣa, Bāṇabhaṭṭa, Daṇḍin, Bhavabhūti, Bhaṭṭanārāyaṇa, Bhilhaṇa, Shrīharṣa, · Schools of Sanskrit Poetics – Rasa, Alaṅkāra, Rīti, Dhvani, Vakrokti, Aucitya, · Chandas – Āryā, Anuṣṭup, Indravajrā, Upendravajrā, Vasantatilakā, Upajāti, Vaṁśastha, Drutavilambita, Śālinī, Mālinī, Śikharṇī, Mandākrāntā, Hariṇī, Śārdūlavikrīḍita, Sragdharā
Module II	**Darśana:** **a) General Introduction of major schools of Darśana with special reference to the following:** Sānkhyakārikā (First 10 Kārikā-s), Yogasūtra (Samādhi pāda), Vedāntasāra, Arthasaṁgraha (Upto Vidhinirūpaṇam) **b) Linguistics:** Definition of Language, Geneological and Morphological classification of Languages, ·Speech Mechanism and classification of sounds: Stops, Fricatives, Semi-Vowels and vowels (with special reference to Sanskrit sounds) · Phonetic Laws (Grimm, Grassman, Verner) Directions of semantic change and reasons of change. · Definition of Vākya and its types. · General introduction of Indo-European family of Languages; · Difference between Vedic Sanskrit and Classical Sanskrit; · Difference between Bhāṣā and Vāk; Difference between language and dialect.
References	*1. Mishra, Jagadishchandra, 2016. (Chapters 1, 3 & Vaidikavāṅmayasyetihāsaḥ, Chaukhamba Surabharati Prakashan, Varanasi.* *2. Mc Donnell, A.A., 2015, A Vedic Reader for Students, Motilal Banarasidas, New Delhi* *3. M. Sriman Narayana Murti, An Introduction to Sanskrit Linguistics, D.K. Publications, Delhi* *4. Sharma, Chandradhar, A Critical Survey of Indian Philosophy. Delhi: Motilal Banarsidass, 2003* *5. Hiriyanna, M. Outlines of Indian Philosophy.Delhi: Motilal Banarsidass, 1993.*

14	ENGLISH
Module I	**Literary Criticism:** Historical Criticism, Marxist Criticism, Feminist Criticism, Psychoanalytic Criticism, Postcolonial Criticism, Structuralism/Post-Structuralism, Deconstruction, New Criticism, Ecocriticism, Queer Theory.
Module II	**Cultural Studies:** Antonio Gramsci & Hegemony, Raymond Williams & Cultural Materialism, Michel Foucault & Biopolitics, Stuart Hall & Representation, Edward Said & Orientalism, Judith Butler & Gender Performativity, Roland Barthes & Semiotics, Louis Althusser & State Apparatuses, Homi K. Bhabha & Hybridity/Third Space, Gayatri Chakravorty Spivak & Subaltern Studies, Jean Baudrillard & Simulacra and Simulation, Frantz Fanon & Decolonization.
Module III	**Indian Writing in English:** Colonialism and Postcolonialism, Partition Literature, Diaspora and Migration, Gender and Feminism, Environmental and Ecological Concerns, Major writers in Indian English Literature.
Module IV	**History and Ages of English Literature:** Beowulf, Geoffrey Chaucer & The Canterbury Tales, Elizabethan Age writers & works, John Dryden, Christopher Marlowe, William Shakespeare, Alexander Pope & The Rape of the Lock, Jonathan Swift & Gulliver's Travels, Victorian Age, Romantic Age and Poets, Charles Dickens, George Eliot, Oscar Wilde, James Joyce, T. S. Eliot, Virginia Woolf, Franz Kafka, Postmodern Period, Toni Morrison,
Module V	**Drama:** Mystery Plays, Morality Plays, Miracle Plays, Shakespearean Drama, Comedy of Manners, Absurd Theatre, William Congreve, John Webster, Henrik Ibsen, George Bernard Shaw, Franz Kafka, Samuel Beckett, Harold Pinter, Anton Chekov, Oscar Wilde.
Module VI	**Poetry:** Sonnets, Ballad, Pastoral Poetry, Cavalier Poets, Surrealism, John Milton, Samuel Taylor Coleridge, John Keats, W. B. Yeats, Robert Browning, Alfred Lord Tennyson, Teg Hughes, Sylvia Plath, Dylan Thomas, W. H. Auden, Jonathan Swift, Robert Frost.

Module VII	**Fiction:** Realism, Stream of Consciousness, Leo Tolstoy, George Orwell, Agatha Christie, Arthur Conan Doyle, Margret Atwood, Virginia Woolf, Jane Austen, Chinua Achebe, Salman Rushdie, Toni Morrison, Franz Kafka, Zadie Smith.
Module VIII	**Linguistics:** Phonetics, Language Teaching and Learning Phonology, Morphology, Syntax, Semantics, Sociolinguistics
References	*1. Abrams, M. H., & Harpham, G. G. (2015). A glossary of literary terms (10th ed.). Cengage Learning India.* *2. Barry, P. (2017). Beginning theory: An introduction to literary and cultural theory (4th ed.). Manchester University Press.* *3. Butler, J. (1990). Gender trouble: Feminism and the subversion of identity. Routledge.* *4. Eagleton, T. (2008). Literary theory: An introduction (Anniversary ed.). University of Minnesota Press.*

15	**HINDI**
Module I	हिंदी भाषा और उसका विकास, हिन्दी की ऐतिहासिक पृष्ठभूमि, हिन्दी क भौगोलिक विस्तार, हिन्दी के विविध रूप हिन्दी, उर्दू, दक्खिनी, हिन्दुस्तानी हिन्दी ध्वनियों के वर्गीकरण का आधार हिन्दी – वाक्य रचना, हिन्दी की संवैधानिक स्थिति, आधुनिक भारतीय आर्य भाषाएं और उनका वर्गीकरण, हिन्दी की उपभाषाएं हिन्दी का भाषिक स्वरूप, हिन्दी भाषा प्रयोग के विविध रूप,कम्प्यूटर और हिन्दी, देवानागरी लिपि,
Module II	हिंदी साहित्य का इतिहास, हिन्दी साहित्येतिहास दर्शन, ,हिन्दी साहित्य का काल विभाजन और नामकरण,भक्तिकाल रीतिकाल सामाजिक-सांस्कृतिक पृष्टभूमि, रीतिकाल की प्रमुख प्रवृत्तियां,आधुनिक काल,समकालीन कविता (वर्ष 2000 तक) हिन्दी उपन्यास,हिन्दी नाटक और रंगमंच,आलोचना का उद्भव और विकास,हिन्दी का प्रवासी साहित्य,हिन्दी साहित्य के इतिहास लेखन की पद्धतियां,आदिकालीन हिन्दी

	का साहित्य,भक्ति काव्य के प्रमुख सम्प्रदाय,रीतिकाल के प्रमुख कवि और उनका काव्य, हिन्दी गद्य का उद्भव और विकास,समकालीन साहित्यिक पत्रकारिता,हिन्दी कहानी का उद्भव और विकास,हिन्दी निबन्ध के उद्भव और विकास,हिन्दी की अन्य गद्य विधाएँ,अवधारणा एवं प्रमुख साहित्यकार
Module III	साहित्यशास्त्र ,काव्य के लक्षण, काव्य हेतु और काव्य प्रयोजन,प्लेटो के काव्य सिद्धान्त,वर्ड्सवर्थ का काव्यभाषा सिद्धान्त टी.एस. इलिएट: निर्वैयक्तिकता का सिद्धान्त, परम्परा की अवधारणा रूसी रूपवाद, नयी समीक्षा मिथक,प्रमुख संप्रदाय और सिद्धान्त रस, अलंकार, रीति, ध्वनि, वक्रोक्ति और औचित्य, रस,निष्पत्ति,अरस्तू : अनुकरण सिद्धान्त, त्रासदी विवेचन, विरेचन सिद्धान्त, कॉलरिज: कल्पना और फैंटेसी, आई.ए. रिचर्ड्स मूल्य सिद्धान्त, संप्रेषण सिद्धान्त तथा काव्य-भाषा सिद्धान्त, फंतासी, कल्पना, प्रतीक, बिम्ब
Module IV	वैचारिक पृष्ठभूमि ,भारतीय नवजागरण और स्वाधीनता आन्दोलन की वैचारिक पृष्ठभूमि,फोर्ट विलियम कॉलेज भारतेन्दु और हिन्दी नवजागरण मार्क्सवाद, मनोविधेषणवाद, अस्तित्ववाद, उत्तर आधुनिकतावाद,हिन्दी नवजागरण खड़ी बोली आन्दोलन,गांधीवादी दर्शन, अम्बेडकर दर्शन, लोहिया दर्शन,अस्मितामूलक विमर्श (दलित, स्त्री आदिवासी एवं अल्पसंख्यक)
Module V	हिंदी कविता,पृथ्वीराज रासो रेवा तट,विद्यापति की पदावली,कबीर,घनानन्द कवित्त,तुलसीदास रामचरितमानस, उत्तर काण्ड, प्रियप्रवास, भारत भारती, साकेत (नवम् सर्ग), आंसू, कामायनी (लज्जा, इड़ा),परिवर्तन, प्रथम रश्मि, उर्वशी (तृतीय अंक), रश्मिरथी, कालिदास, बादल को घिरते देखा,है, अकाल और उसके बाद, खुरदरे पैर,शासन की बंदूक, कलगी बाजरे की, यह दीप अकेला, हरी घास पर क्षण भर असाध्य,वीणा कितनी नावों में कितनी बार,अमीर खुसरो खुसरों की पहेलियाँ और मुकरियाँ,जायसी ग्रंथावली (नागमती वियोग खण्ड),बिहारी सतसई,सूरदास भ्रमरगीत सार,मीरा, विश्वनाथ त्रिपाठी,जूही की कली, जागो फिर एक बार, सरोजस्मृति, राम की शक्तिपूजा, कुरमुत्ता,

	बाँधो न,नाव इस ठाँव बंधु,बीन भी हूँ मैं तुम्हारी रागिनी भी हूँ, मैं नीर भरी दुख की बदली, फिर विकल है प्राण,मेरे, यह मन्दिर का दीप इसे नीरव जलने दो, द्रुत झरो जगत के जीर्ण पत्र,गीत फरोश, सतपुड़ा के जगल, भूल गलती ब्रह्मराक्षस अंधेरे में, मोचीराम, अकाल दर्शन,रोटी और संसद
Module VI	हिंदी उपन्यास:देवरानी जेठानी की कहानी,शेखर एक जीवनी (भाग – 1),मैला आंचल, झूठा सच, मानस का हंस परीक्षा गुरु, गोदान,बाणभट्ट की आत्मकथा,तमस, राग दरबारी, जिंदगीनामा,
Module VII	हिंदी कहानी:चन्द्रदेव से मेरी बातें. दुलाईवाली,राही, ईदगाह, दुनिया का अनमोल रतन,आकाशदीप, अपना- अपना भाग्य गैंग्रीन, कोसी का घटवार,चीफ की दावत, इंस्पेक्टर मातादीन चाँद पर,एक टोकरी भर मिट्टी, उसने कहा था,कानों में कंगना, परिंदे तीसरी कसम, लाल पान की बेगम,अमृतसर आ गया है, सिक्का बदल गया,पिता, राजा निरबंसिया.
Module VIII	हिंदी नाटक:अंधेर नगरी, भारत दुर्दशा,अंधायुग, सिंदूर की होली, एक और द्रोणाचार्य,आगरा बाजार, बकरी,चन्द्रगुप्त, स्कंदगुप्त, ध्रुवस्वामिनी,आधे-अधूरे, आषाढ़ का एक दिन,अंजो दीदी, महाभज,
Module IX	: हिंदी निबंध:दिल्ली दरबार दर्पण, भारतवर्षोन्नति कैसे हो सकती,मेरे राम का मुकुट भीग रहा है, संस्कृति और सौंदर्य मजदूरी और प्रेम, उत्तराफाल्गुनी के आस-पास ,शिवशंभु के चिट्टे, कविता क्या है,नाखून क्यों बढ़ते हैं,उठ जाग मुसाफिर
Module X	आत्मकथा, जीवनी तथा अन्य गद्य विधाएं :माटी की मूरतें, ठकुरी बाबा, मेरी तिब्बत यात्रा,मुर्दहिया, प्रेमचंद घर में, आवारा मसीहा,एक कहानी यह भी, क्या भूलूँ क्या याद करूं,आपहुदरी, भोलाराम का जीव,संस्कृति के चार अध्याय, एक लेखक की डायरी जामुन का पेड़, अरे यायावर याद रहेगा.
Module XI	प्रयोजनमूलक हिन्दी:प्रयोजनमूलक हिन्दी,राजभाषा हिंदी,हिंदी पत्रकारिता

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