



## **CENTRAL UNIVERSITY OF HIMACHAL PRADESH**

[Established under the Central Universities Act 2009]

PO Box: 21, Dharamshala, District Kangra - 176215 (HP)

[www.cuhimachal.ac.in](http://www.cuhimachal.ac.in)

### ***Course Contents of Entrance Exam for Ph.D Program in Department of Accounting and Finance***

#### **Unit 1 Financial Management**

Nature and Scope of Finance, Financial Management, Objective of the firm; Finance Functions, Sources of Finance, Capitalization, under and over Capitalization. Time value of Money: Compounding (Interest rate: simple and compounded) and discounting (present value). Fundamental of Risk and return. Capital budgeting process, Capital budgeting Technique, Capital Rationing, Adjusted Net Present Value.

#### **Unit II Corporate Finance**

Cost of Capital: Calculating Cost of Specific Funds and weighted average cost of capital. Capital Structure: Meaning, relevance of Capital Structure-Net Income and traditional view and irrelevance of Capital Structure-NOI and MM hypothesis. Dividend policy: Relevance and irrelevance model. Objective and Practical consideration of dividend policy, Forms of dividend.

#### **Unit III Financial Markets and Institutions**

The Indian Financial System: Components of formal financial system, Functions of a financial system. Financial Markets: The Money market; Functions, Instruments, Tools for managing liquidity in money markets. Capital Markets: Functions, Primary Capital market, Secondary Capital market, The Primary market, The Secondary market. Banking Institutions, Functions of a Bank, Scheduled Commercial Banks, Reforms for Banking sector, Capital Adequacy, Basel Norms in India. Cooperative Banking – Urban and Rural Co-operative Banking Institutions, Functions of a Bank, Scheduled Commercial Banks,

#### **Unit IV Portfolio and Investment Management**

Portfolio Management – Risks and Returns: Concept of portfolio and portfolio management, concept of risk, types of portfolio management. Markowitz Portfolio Selection Model: Concept of portfolio analysis and diversification of risk. Markowitz Model and Efficient Frontier. Capital Asset Pricing Model (CAPM). Arbitrage Pricing Theory and its principles, Comparison of Arbitrage Pricing Theory with the Capital Asset Pricing Model. Fundamental Analysis. Technical Analysis. Efficient Market Hypothesis

## **Unit V Emerging concepts in Accounting and Finance**

GST, Econometric tools used in finance, Micro Finance, Retail Banking, Financial Inclusion, Bancassurance, Mergers and Acquisitions, Leasing, Factoring, Forfaiting, Merchant banking, Role of Stock markets in raising finance.

# **CENTRAL UNIVERSITY OF HIMACHAL PRADESH**

[Established under the Central Universities Act 2009]

PO Box: 21, Dharamshala, District Kangra - 176215 (HP)

[www.cuhimachal.ac.in](http://www.cuhimachal.ac.in)

## **Syllabus of Entrance Examination for the Admission in Ph.D Programme Research Methodology for Business (Common to all Departments of SBMS)**

### **UNIT – I: Research: Nature & Concept**

- Nature of Scientific Methods and its Application to Management
- Applications of research in Finance, HRM, Marketing, Operations Management and Entrepreneurship etc.

### **UNIT – II: Research Process and Sampling**

- Steps in the Process of Research - Problem Selection, Formulation and Planning
- Problem formulation: Identification Probable Issue for Research, Selection Specific Research Issue, Formulation of Objectives, Clarifying the Objectives.
- Probability Sampling: Simple Random Sampling, Proportionate and Disproportionate Stratified Random Sampling, Cluster Sampling.
- Non-Probability Sampling: Accidental Sampling, Quota Sampling, Purposive Sampling, Snowball Sampling.

### **UNIT – III: Hypotheses, Methods and Tools of Data Collection**

- Hypotheses: Nature, Characteristics, Sources & Types
- Statistical Inference: Point and interval estimates, Parametric and Non Parametric Tests
- Tools of Data Collection: Primary & Secondary, Observation, Interview Schedule, Questionnaire, Types and Formats.
- Secondary data sources

### **UNIT – IV: Research Designs**

- Research Design: Concept and Types
- How to write effective research paper

### **UNIT – V: Statistical Analysis**

- Graphic and Diagrammatic Presentation, Descriptive Statistics and Inferential Statistics
- Regression: Simple, Multiple
- Factor Analysis, conjoint Analysis, Discriminant analysis.

# **SYLLABUS FOR DEPARTMENTAL ENTRANCE EXAM- SPECIALIZATION HRM & OB**

## **UNIT 1**

- Learning and Theories of Learning
- Personality – Components and Theories
- Perception- Concept, Factors affecting Perception
- Attribution Theory and Perceptual Errors

## **UNIT II**

- Meaning and Components of Attitude
- Job satisfaction and Factors Affecting Job satisfaction
- Theories of leadership-Trait , Contingency, Behavioural and Contemporary Theories
- Motivation – Concept and Importance; Content and Process Theories of Motivation

## **UNIT III**

- Organizational Culture- Types and Dimensions
- Stress and Well Being at Work
- Organizational Development
- Managing Change

## **UNIT IV**

- Human Resource Planning
- Recruitment, psychological testing, selection process and its Techniques.
- Training policies, programmes & techniques
- Legal Framework of employment

## **UNIT V**

- Performance Management and Performance Appraisal
- Contemporary global trends and management of human resources
- Job Evaluation and compensation management
- Talent Management and Competency Management

# Syllabus of Entrance Examination for the Admission in Ph.D Programme

## Specialization: Marketing and Supply Chain Management (M&SCM)

The syllabus for the second component (subject specific knowledge-50% weightage) of entrance examination for the admission in Ph.D programme of the Department of Marketing & Supply Chain Management is as follow:

This paper will consist of 50 objective type questions of 1 mark each (**50 marks**) related to basics of Marketing and Supply Chain Management.

- Fundamentals of Marketing: History, Nature, Importance and Process of Marketing Management, Core marketing concepts, customer value
- Marketing Environment and Consumer Behaviour: Marketing Environment vis-à-vis Marketing Decisions, Components of Modern Marketing Information System, Consumer Markets and Role of Marketing, Consumer Vs Organisational Buyer Behaviour, Buyer roles, Buying Process, Segmentation, Targeting, Positioning
- Marketing Mix: Product Decision, Product Mix, NPD, PLC, Pricing Strategies, Channel Decisions, Channel Partners, Channel Systems, Marketing Communication, Components of IMC
- Supply Chain Management: Logistics and Supply Chain Management, Sales and Distribution Management
- Emerging Concepts in Marketing: IT implications on Modern Marketing, CRM, e-CRM, Digital and Web Based Marketing, Implications of Artificial Intelligence and Cloud computing on Marketing, B2B Marketing, Green Marketing, Rural Marketing, Retail Management, Service Marketing and Social Marketing



# CENTRAL UNIVERSITY OF HIMACHAL PRADESH

[Established under the Central Universities Act 2009]  
PO Box: 21, Dharamshala, District Kangra - 176215 (HP)  
[www.cuhimachal.ac.in](http://www.cuhimachal.ac.in)

## **Syllabus for PhD entrance test**

### **Waste/carbon management and toxicology**

Solid waste, Biodegradable, Non Biodegradable, Hospital and Pharmaceutical, Radioactive waste, Change in carbon pools, management plans are focused on (a) minimizing emission (b) maximizing environmentally sound reuse, reduce and recycling; (c) effective treatment and (d) converting carbon into valuable products with atom economy. Chemical and biological methods for carbon management, Modification in carbonic anhydrase (CA).

Toxic Properties of Chemical Substances, pathway of entry; detoxication, bioactivation. Physical properties of toxic and hazardous waste (vapour pressure, Vapour density, solubility etc), Toxic and hazardous characteristic various organic chemicals, Cancer-Causing Chemicals, Concept of carcinogenesis, Mechanism of chemical carcinogens, Human carcinogens, Toxic, and Flammable Gases, Insecticides, Asbestos, Flyash, Ozone and PAN pesticides, Chemical and Biological agents including warfare Agents. Necessity and viability of the methods of green chemistry to the chemical sciences and related disciplines, use of alternative feedstocks or starting materials, reagents, solvents, target molecules, and catalysts.

### **Geology /Geophysics**

Modern theories on the origin of the Earth, Internal structure of Earth, fundamental characteristics of crust, mantle, core; different types of seismic waves and their path of propagation, Theory of Plate tectonics and its implications in understanding mountain building and sea floor spreading processes, Formation of oceans, continents and mountains, Distribution of earthquake and volcanic activity across the globe, How do earthquake occurs, cause intensity and magnitude, seismic hazard map of India, Causes, and impact of landslides, Causes of Floods and Flood prone areas of India, Droughts and their causes, causes of volcanoes. Introduction to rocks and minerals. Different types of rocks and their characteristics, Rock cycle, water cycle. Fundamentals on rock-forming minerals; weathering and erosion of rocks and minerals. Age of Earth and basic information on life and evolution Geological Time Scale and rock record. Major Geological events. Land-ocean interaction and biogeochemical cycling, Water cycle and availability of water. Economics of water. Physical work of river, wind, glacier and lake. Exploration geophysics and their applications in geology.

### **Ecology, Biodiversity and Environmental Microbiology Section**

Ecology- Scope, Subdivisions, major landmarks in Ecology, Organisms and Environment-Holocoenotic nature of environment; biotic and abiotic components. Population characteristics; population dynamics and concept of carrying capacity; Regulation of population growth, Community concept, community characteristics, species diversity  $\alpha$ ,  $\beta$  and  $\gamma$ ; concept of ecological niche- types, ecotone & edge effect, Ecological succession-concept, causes and trends; Basic types of succession, General process of succession, Ecosystem Development, concept of climax, Biome. Ecosystem structure and functions; primary production.

Biodiversity- Genetic, Species and Ecosystem Diversity; Measuring biodiversity-Alpha, Beta and Gamma diversity, Reasons for biodiversity richness in tropics, Concept of precious genetic library, Biodiversity and human health, Brief account of plant-derived substances developed into valuable drugs, Overview of herbal extract industry in India. Diversification through time, distribution of biodiversity, Biodiversity hot spots- definition, brief account of biodiversity hot spots of India; Important terms-Vulnerable, Endangered, critically endangered, Present scenario of Biodiversity and wildlife conservation in India; National Parks, Biosphere Reserves and sanctuaries; Keystone species in conservation strategy, Endangered wildlife special projects-Tiger, Gir-Lion and elephant projects, National Biodiversity Authority; International approaches for conservation of Biodiversity- IUCN.

Microbial Ecology- Structural and functional aspects of viroids, prions, Viruses and Bacteria, Microbes and sustainable agriculture, Microbial interactions, quorum sensing.

### **Atmospheric Science**

Vertical Structure and Composition of the Earth's Atmosphere: Chemical Composition, The State of the Atmosphere, Atmospheric Density and Pressure, Hydrostatic Balance

Atmospheric Thermodynamics: The Ideal Gas Law and First Law of Thermodynamics, Concept of Air Parcel and Lapse Rates Atmospheric Stability Mixing Height and Inversion

Atmospheric Energy Balance : Electromagnetic Radiations, Black Body Radiation, The Solar Constant and the Budget of Solar Radiation, Terrestrial Radiation, The Earth's Radiative Energy Balance, Green House Effect

Atmospheric Chemistry: Thermochemical and Photochemical Reactions, Chemistry of Stratosphere, Stratospheric Ozone Depletion, Chemistry of Troposphere, Acid Rain, Atmospheric Aerosols, Atmospheric Trace Gases

Atmospheric Dynamics: Pressure Belts and Winds, Pressure Gradient Force, Coriolis Force, Centrifugal Force, Friction, Global Circulation

### **Glaciology, Introduction to Earth Processes:**

Introduction to Earth Science , Origin of Earth, Homogeneous and differentiated earth, Different mineral groups, Geomorphology: Continental Drift hypothesis, Theory of Plate tectonics, Mountain building and sea floor spreading processes and basic oceanography.

Glacier basics, Glaciers and climate change, Status of Indian Himalayan glaciers, Glaciations, Glacier systems, Structure and morphology of glaciers, Glacial erosion, Landscape evolution and different glacial landforms, Glacier Hazards, Glacier Mass Balance and Processes, Glacier and water resource, Glacial hydrology, Methods for determining glacial runoff, Glacial remote sensing, Glacier Hazard monitoring, Different instruments used for studying glacier fluctuations, Introduction to glacier modelling, A review of glaciological work in Polar region and Indian Himalaya.

### **Nano technique and environment**

Properties of materials & nanomaterials, Scanning and Transmission electron microscopy, X-ray diffraction, X-ray Photoelectron spectroscopy, Energy dispersive X-ray analysis, Atomic force microscope, Raman Spectroscopy, UV-visible spectroscopy and Photoluminescence spectroscopy, chemical and biosensors, hydrogen generation and storage, hybrid energy cells.

Parameters for monitoring,,Environmental Divisions, Natural Cycles, Basic of environmental chemistry including chemistry of air water and soil. Principles of Natural Resource Management , Environmental Risk Assessment, Law of Motion, Work, Energy and Power, Gravitation; Gas Laws, Thermodynamics.

SCHOOL OF EDUCATION  
CENTRAL UNIVERSITY OF HIMACHAL PRADESH  
DHARMASHALA

PHD SYLLABUS FOR SCREENING / ENTRANCE TEST

The entrance test for PhD Programme in Education shall comprise of 100 marks. The question paper will have 100 objective questions of one mark each. The candidates need to attain 50 percent marks in the test to qualify for Personal Interview. The entrance test would be evaluating the research aptitude and yearning for higher education in the candidate. The paper will be divided into two parts. Part A will focus upon evaluating knowledge and understanding of Research and Research Methodology in general. Part B will evaluate the candidate's knowledge and understanding of Education as discipline, practice and praxis. The brief outline of the syllabus of entrance test is given below, however the curriculum of education will be the guiding force.

**Part – A**

**Research Methodology and Research in Education**

- Meaning & Objectives of Research
- Type of Research, Research Problem, Research Design
- Quantitative Vs Qualitative Research
- Hypotheses and their Testing
- Population & Sampling
- Data Collection: Methods, Techniques & Tools
- Measure of Central Tendency, measures of dispersion, correlation, Normal probability curve and its application, 't'-test and ANOVA
- Research Report Writing
- Different Referencing Styles

**Part – B**

**Philosophical Perspective of Education**

- Indian Philosophical Systems (Nyaya, Samkhya, Mimansa, Buddhist, Jain, Vedanta and Chanakya)
- Western Philosophical System (Idealism, Naturalism, Progressive and Radical Education)
- Thinkers on Education (Gandhi, Tagore, Dewey and Friere)

### **Sociological Perspective on Education**

- Emergence of Sociological Perspective (Durkheim, Spencer, Marx and Weber)
- Functionalism, Conflict Theory, Liberalism Indian Society
- Caste, Religion, Gender, Justice, Equality and Equity
- Quality and Access of Education

### **History of Education**

- Education in Ancient India, Medieval India and Modern India
- Education in Post-Independence India
- University Education, Commission, Mudaliar Commission, Kothari Commission, NEP-1986, PoA 1992, Yashpal Committee, NCF-2000 and 2005
- RTE-2009

### **Psychological Foundation of Education**

- School of psychology: structuralism, functionalism, behaviourism. Psychoanalysis, Humanistic and cognitive psychology
- Human growth & development: Piaget, Vygotsky, Cognitive development theory
- Learning Curves: Theory of Learning, psychology of motivation and theory of motivation
- Intelligence – Neuroscience of Intelligence- Theory of Intelligence
- Personality Theories, Adjustment, Creativity, Guidance & Counselling

\*\*\*\*\*



## हिमाचल प्रदेश केंद्रीय विश्वविद्यालय

(केंद्रीय विश्वविद्यालय अधिनियम 2009 के अंतर्गत स्थापित केंद्रीय विश्वविद्यालय)

पो.बाक्स : 21, धर्मशाला, जिला- काँगड़ा, हिमाचल प्रदेश -176215

### सूचना

### हिन्दी एवं भारतीय भाषा विभाग

### पी.एच.डी प्रवेश परीक्षा के लिए पाठ्यक्रम –

#### क) शोध पद्धति :

शोध अर्थ एवं स्वरूप : अन्वेषण, गवेषणा, अनुशीलन, आलोचना

शोध विभिन्न पद्धतियाँ : सर्वेक्षण, आलोचनात्मक, भाषा वैज्ञानिक, शैली वैज्ञानिक, तुलनात्मक, आगमन-निगमन पद्धतियाँ

शोध के प्रकार : लोक तात्विक शोध, तुलनात्मक शोध, साहित्येतिहास का शोध, पाठानुसंधान

अंतर्विद्यावर्ती शोध : सौन्दर्यशास्त्रीय शोध, समाज शास्त्रीय शोध, भाषा वैज्ञानिक शोध, शैली वैज्ञानिक शोध

शोधार्थी एवं शोध-निर्देशक : प्रमुख गुण एवं अन्य योग्यतायें

विषय चयन एवं रूपरेखा : विषय चयन, विश्वविद्यालय की भूमिका, पंजीयक मंडल, निर्देशक की भूमिका, रूपरेखा निर्धारण की पद्धति

उद्धरण एवं पाद टिप्पणियाँ : प्राथमिक स्रोत, गौण स्रोत, उद्धरण टीप, पाद टिप्पणियाँ एवं सन्दर्भ सूची

#### ख) हिन्दी भाषा एवं साहित्य :

हिन्दी साहित्य का क्रमिक इतिहास

भारतीय एवं पाश्चात्य काव्यशास्त्र

हिन्दी भाषा एवं बोलियाँ

हिन्दी नाटक और रंगमंच

हिन्दी कथा साहित्य

हिन्दी गद्य की अन्य विधाएँ – निबंध, संस्मरण, आलोचना, रेखाचित्र, आत्मकथा, जीवनी, रिपोर्टाज आदि |

विभागाध्यक्ष

हिन्दी एवं भारतीय भाषा विभाग



**Central University of Himachal Pradesh**  
(Established under Central Universities Act 2009)  
DHAULADHAR CAMPUS, DHARAMSHALA, DISTRICT KANGRA – 176215

**Department of English**  
**PhD Screening/Entrance Test Syllabus**

**Paper I: Research Methodology (50 marks)**

- Research: Meaning, Nature, Objectives, Relevance
- Research Methods/Types of Research:
  - Basic Research
  - Applied Research
  - Quantitative Research
  - Qualitative Research
  - Descriptive Research
  - Fundamental Research
  - Analytical Research
  - Conceptual Research
  - Empirical Research
  - Historical Research
  - Literary Research
- The Research Process:
  - Research Ethics
  - Mechanics of Writing
  - Documentation
- Critical Approaches to Study Literature:
  - Pre-critical Response
  - Textual Scholarship and Source Study
  - Historical and Biographical Approaches
  - Moral and Philosophical Approaches
  - Formalist Approach
  - Psychological Approach
  - Mythological and Archetypal Approaches
  - Reader-Response Criticism
  - Research Methods for English Studies: An Introduction
  - Auto/ biography as a Research Method
  - Discourse Analysis
  - Textual Analysis as a Research Method
  - Interviewing

**Paper II: Subject (English Literature) (50 Marks)**

- History of English Literature
- History of Literary Criticism
- Literary Theory
- Indian Writing in English
- American Literature
- Australian Literature
- World Literature
- Postcolonial Literature

**Head**

Department of English

Central University of Himachal Pradesh

# विद्यावारिधिपाठ्यक्रमप्रवेशार्थम् विभागीया परीक्षा

## पाठ्यक्रमः

१. शोधप्रविधिः - समस्याचयनम्, विषयनिर्धारणम्, शीर्षककल्पनम्, सामग्रीसङ्कलनम्, स्रोतसामुपलब्धताविमर्शः, प्राथमिकस्रोतांसि, द्वितीयकस्रोतांसि, विषयस्य व्याप्तिः, प्राक्कल्पना, सर्वेक्षणम्, लिप्यन्तरणे चिह्नानि, ग्रन्थांशानां व्यवस्थापनम्, तुलनात्मकः, विश्लेषणात्मकः, आलोचनात्मकश्च शोधप्रविधिः, पाठालोचनम्, वंशवृक्षनिर्माणम्, शोधप्रस्तावनिर्मितिः, सन्दर्भसूची-निर्माणम्, शोधपत्रनिर्माणम्, ग्रन्थालोचनम् ।

## २. विषयज्ञानम् -

- ( क. ) व्याकरणम् - हलन्ताजन्तपुंल्लिङ्गस्त्रीलिङ्गनपुंसकलिङ्गशब्दरूपाणि, भ्वादित आरभ्य चुरादिगणं यावत् पठितानां धातूनां रूपाणि, भावकर्मप्रक्रिया, परस्मैपदात्मनेपदप्रक्रिया, समासः, कारकाणि, कृदन्तप्रक्रिया, तद्धितप्रक्रिया, स्त्रीप्रत्ययाः, महाभाष्ये पस्पशाह्निकम्, वाक्यपदीये ब्रह्मकाण्डम् ।
- ( ख. ) साहित्यम् - स्वप्नवासवदत्तम्, अभिज्ञानशाकुन्तलम्, उत्तररामचरितम्, मृच्छकटिकम्, वेणीसंहारम्, रघुवंशम्, कुमारसम्भवम्, किरातार्जुनीयम्, नैषधचरितम्, शिशुपालवधम्, कादम्बरी, वासवदत्ता, दशकुमारचरितम् ।
- ( ग. ) काव्यशास्त्रम् - ध्वन्यालोकः, दशरूपकम्, काव्यप्रकाशः, साहित्यदर्पणः ।
- ( घ. ) दर्शनम् - साङ्ख्यकारिका, वेदान्तसारः, तर्कसङ्ग्रहः, योगदर्शनम्, सर्वदर्शनसङ्ग्रहः ।
- ( ङ. ) वेदाः वेदाङ्गानि च - सूक्तानि - अग्नि-इन्द्र-वरुण-वाक्-पुरुष-हिरण्यगर्भ-शिवसङ्कल्प-पृथिवी-नदीविश्वामित्र-सरमापणि-उर्वशीपुरुरवा च । निरुक्तम्, पाणिनीयशिक्षा ।
- ( च. ) उपनिषदः - ईश-केन-कठ-प्रश्न-मुण्डक-तैत्तिरीय-माण्डूक्य-श्वेताश्वतर-छान्दोग्य-बृहदारण्यकानि च ।
- ( छ. ) पुराणानि - अष्टादशपुराणानां सामान्यपरिचयः ।
- ( ज. ) भाषाविज्ञानम् - ध्वनिविज्ञानम्, पदविज्ञानम्, वाक्यविज्ञानम्, अर्थविज्ञानम् ।
- ( झ. ) स्मृतयः - मनुस्मृतिः, याज्ञवल्क्यस्मृतिः ।

**Syllabus of the PhD Department Level Screening/ Entrance Test**  
**Journalism and Mass Communication**

1. Research Methodology
2. Communication Theories and Models
3. News Reporting
4. Editing Principles and Practices
5. Advertising
6. Public Relations and Corporate Communication
7. Development Communication
8. Film Studies
9. Media and Social Issues
10. Mass Communication Laws and Ethics
11. History of Mass Communication
12. ICT and Media
13. Intercultural Communication.
14. Photo Journalism
15. Computer Applications for Journalists.

## **SYLLABUS FOR PhD ENTRANCE TEST – MASS COMMUNICATION**

### **Paper - I**

#### **Subject: Mass Communication**

Mass communication as discipline; Understanding Human Communication - Communication to Mass Communication and beyond; Structure, Elements and Process of Mass Communication; Approaches to study communication theory; Mass Communication-Traditions and models; Theories of media and theories of society; Critical-Cultural Theories and Beyond; Theoretical Approaches to Development Communication, Ecological Concern to Media Studies; Perspectives on Technology and Communication

### **Paper-II**

#### **Subject: Research Methodology**

Philosophy of research- a debate between positivism, pos-positivism, constructivism, realism; Philosophizing communication research; History of communication research; Strategies in communication research; Paradigm of communication research; Conceptualization, operationalization & measurement, Research design/approach- qualitative and quantitative debate, Research methods in media studies, Practicing research in media – print, electronic, and web, Studying social and cultural effects of media content, Measuring media and public agenda

## **PhD in Computational Biology and Bioinformatics**

The entrance test will be consisting of two sections. **Section A** will have 50 multiple choice questions on research methodology.

**Section B** will have 50 multiple choice questions from the area of research pertaining to candidate's application. Centre has advertised four different PhD positions in four separate frontier areas of Bioinformatics.

1. Structural Bioinformatics
2. Systems biology and computational genomics
3. Molecular modelling and computer aided drug discovery
4. Genetics, genomics and proteomics

**Section B** will contain master's level questions requiring thinking and analysis in these four subject areas.



# Central University of Himachal Pradesh

(Established under Central Universities Act 2009)

PO BOX: 21, DHARAMSHALA, DISTRICT KANGRA - 176215, HIMACHAL PRADESH

Website: [www.cuhimachal.ac.in](http://www.cuhimachal.ac.in)

## **Department of Mathematics, Central University of Himachal Pradesh Syllabus for the PhD Screening/ Entrance Test Section A (Mathematics): 50 Marks**

The syllabus for this section is same as of CSIR-UGC National Eligibility Test (NET) for Junior Research Fellowship and Lecturer-ship Examination excluding: Probability, Statistics and Operations Research. The details of which are available at:

[http://csirhrdg.res.in/mcs\\_ma\\_sybls.pdf](http://csirhrdg.res.in/mcs_ma_sybls.pdf)

### **Section B (Research Methodology): 50Marks**

Sample space, discrete probability, independent events, Bayes theorem. Random variables and distribution functions (univariate and multivariate); expectation and moments. Independent random variables, marginal and conditional distributions.

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. 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.

Variation of a functional, Euler-Lagrange equation, Necessary and sufficient conditions for extrema. Variational methods for boundary value problems in ordinary and partial differential equations. Linear integral equation of the first and second kind of Fredholm and Volterra type, Solutions with separable kernels. Characteristic numbers and eigenfunctions, resolvent kernel.

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.

**Department of Physics and Astronomical Science  
Central University of Himachal Pradesh**

**Syllabus for the PhD Screening/ Entrance Test**

**Section A (Physics): 50 Marks**

The syllabus for this section is same as of CSIR-UGC National Eligibility Test (NET) for Junior Research Fellowship and Lecturer-ship Examination. The details of which are available at:

[http://csirhrdg.res.in/mcs\\_ph\\_sylbs.pdf](http://csirhrdg.res.in/mcs_ph_sylbs.pdf)

**Section B (Research Methodology): 50Marks**

Data Analysis and Interpretation, Uncertainties in Measurements: Measuring Errors, Uncertainties, Parent and Sample Distributions, Mean and Standard Deviation of Distributions, Binomial Distributions, Poisson Distribution, Gaussian or Normal Error Distribution, Lorentzian Distribution; Approximation and Errors in Computing: Significant Digits, Numerical Errors, Modelling errors, Conditioning and Stability, Convergence of Iterative Processes.

Error Analysis: Instrumental and Statistical Uncertainties, Propagation of Errors, Application of Error Equations, method of Least squares, Statistical Fluctuations, Probability Tests,  $\chi^2$ -test of a distribution.

Curve fitting (Regression Analysis); Least square Fit to a Straight line, error estimation of the fitted parameters, limitations of the least square method, Least squares fit to a polynomial, matrix solution, Goodness of a fit, Linear Correlation Coefficient, Multivariable Correlations.

Numerical solutions of Transcendental Equations and Ordinary Differential Equations, Runge-Kutta Methods.



# CENTRAL UNIVERSITY OF HIMACHAL PRADESH

[Established under the Central Universities Act 2009]

PO Box: 21, Dharamshala, District Kangra - 176215 (HP)

www.cuhimachal.ac.in

## **Syllabus for PhD admission Test in the Dept of Chemistry and Chemical Sciences**

### **Bioresources and Environmental Biotechnology**

**Bioresources-** importance of bacteria, fungi as bioresources; their beneficial effect and mechanism of action; Introduction to Environmental biotechnology- definition, scope; role of biotechnology in development and sustainability;

**Bioremediation:** Environmental Xenobiotics and human health; principles of bioremediation; TOL plasmid pathway; aerobic and anaerobic microbial degradation processes; degradation of benzene, toluene, xylene, biphenyl, and degradation pathways. Bioremediation of low and high molecular weight PAH (naphthalene, phenanthrene, pyrene, fluoranthene, anthracene, benzo (a) pyrene) with detail discussion of enzymatic degradation pathway. Analysis technique and experimental procedure. Bioremediation of organophosphorus pesticides including biodegradation and biosorption techniques. Mechanism of remediation techniques and analytical procedure.

**Recombinant DNA technology:** Early discoveries, restriction endonucleases, ligases, modification enzymes, DNA and RNA markers, cloning and expression vectors (plasmids, bacteriophage, phagmids, cosmids, artificial chromosomes), selection of recombinant clones, CDNA synthesis and cloning (mRNA enrichment, reverse transcription, DNA primers, linkers, adaptors and their chemical synthesis, library construction and screening).

**Genetic engineering:** Release of genetically engineered microorganisms, genetically modify corps-safety and environmental risks.

### **Analytical Techniques**

**Introduction to Chromatography:** Basic principle of Analytical techniques. Different types of Chromatography techniques and their applications. Thin layer Chromatography – Basic principle, methodology, application.

**High Performance Liquid Chromatography:** Basic Principle, Methodology, Application. Discussion with examples based on published research papers.

**Gas Chromatography:** Basic Principle, Methodology, Application. Discussion with examples based on published research papers.

**Liquid and Gas Chromatography-Mass spectrometry:** Basic Principle, Methodology, Application. Discussion with examples based on published research papers.

# **Syllabus**

**PhD Entrance (Monsoon Semester)**  
**Department of Economics & Public Policy**  
**Central University of Himachal Pradesh**

## **Part I: Research Methodology**

Research Paradigms; Ontology, Epistemology, Methodology, and Methods; Scientific Research (Characteristics, Types, and Methods); Concepts, Constructs, Variables, and Types of Measurement Scale; Formulation of Research Problem; Research Design; Sampling; Questionnaire, Interview Schedule, Interview, Observation, Case Study; Measures of Central Tendency, Measures of Dispersion; Hypothesis; Test of Hypotheses; Type I and II Errors, Level of Significance; Tests involving Normal Distributions, Tests Involving Sample Differences; Tests Involving Binomial Distributions; Small Sampling Theory; The Chi-square Test

## **Part II: Economic Theory, Mathematics and Econometric Methods**

Theory of Consumer and Producer Behaviour; Market Structures: Perfect Competition, Monopoly and Oligopoly; Factor pricing, Externalities and Public Goods; General Equilibrium.

Theories of consumption and Investments; Derivation, properties and shifts in IS and LM curves and simultaneously equilibrium in the goods and money market. Monetary and Fiscal policy; Effects of monetary and fiscal policies under different cases in IS and LM framework including derivation of aggregate demand curve; Rational Expectations.

Linear and Non-linear functions and their applications - Application of Differential and Integral Calculus in consumer behaviour and production theories – Matrix algebra and its application. Optimisation without constraint, Optimisation under constraint; Statistics & Econometrics: Theory of Probability, Ordinary Least Squares (OLS) Model Estimation, BLUE Properties, Hypothesis Testing & Prediction, Heteroscedasticity, Autocorrelation & Multicollinearity, Dummy Variables, Simultaneous Equation System & the Problem of Identification;

## **Syllabus for the Entrance Test in PhD Programme in the Department of Sociology and Social Anthropology**

### **Important Instructions:-**

- **The Entrance Test will comprise total of 100 marks.**
- **The syllabus is divided into two sections (Research Methodology and Subject Specific) carrying 50 marks each.**
- **Each section has 30 Multiple Choice Questions of 30 Marks. (30 X 2 = 60)**
- **Each section has Four Subjective Questions in which candidate has to attempt Two Questions of total 20 Marks. (20 X 2 = 40)**

### **Section A:**

#### **Research Methodology**

Nature of Social Research: Qualitative Vs Quantitative

Scientific Method and its limitations

Problem of Objectivity and Value Neutrality

Fact, Theory and Concept

Methods of Social Research: Hypothesis, Research Design and Sampling

Techniques of Data Collection: Observation, Questionnaire and Interview

Case Study: its relevance and limitations

Basic Statistics: Mean, Median & Mode

Research Report and Presentation of Data

### **Section B:**

#### **Subject Specific**

Sociology: Nature, Scope and its Emergence

Theoretical Perspectives in Sociology

Social Stratification

Social Change and Social Control

Culture and Socialization

Marriage, Family and Kinship

Social Movements and Reforms

Political Sociology

Indian Sociology: Themes and Perspectives

## **Syllabus for Screening Test to PhD Aspirants in Dr Ambedkar Chair**

- 1. PAPER I: Research Methodology (Subjective), Duration: 2 Hours, MM: 100**
  1. Steps of Research Process
  2. Social Investigation and Research
  3. Qualitative and Quantitative Methods
  4. Methodological Strategy
  5. Computer Application in Research
  6. Probability Sampling Technique
  7. Presentation of Data
  8. References and Bibliography
  9. Classification of Sources
  
- 2. PAPER II: Life and Works of Dr B R Ambedkar (Objective), Duration: 1 Hour, MM: 100**
  1. Life and mission of Dr Bhim Rao Ramjin Ambedkar
  2. Baba Saheb and his major works
  3. Baba Saheb as a Social Reformer
  4. Baba Saheb as an Economist
  5. Baba Saheb as a Constitutionalist.
  
- 3. Personal Interview / Presentation**

**जनजातीय अध्ययन पीठ**  
**Chair for Tribal Studies**  
**हिमाचल प्रदेश केन्द्रीय विश्वविद्यालय**  
**Central University of Himachal Pradesh**

**Syllabus for Screening Test to PhD Aspirants in Tribal Studies**

- 1. PAPER I: Research Methodology (Subjective), Duration: 2 Hours, MM: 100**
  1. Steps of Research Process
  2. Qualitative and Quantitative Methods
  3. Methodological Strategy
  4. Computer Application in Research
  5. Probability Sampling Technique
  6. Presentation of Data
  7. References and Bibliography
  8. Classification of Sources
  
- 2. PAPER II: Knowledge of Tribal Community (Objective), Duration: 1 Hour, MM: 100**
  1. Language
  2. Literature
  3. Customs and Traditions
  4. Culture and Heritage
  
- 3. Personal Interview / Presentation**

## SCHEME AND SYLLABUS FOR PH.D ENTRANCE EXAMINATION-FOR TOURISM MANAGEMENT

### PAPER I – RESEARCH METHODOLOGY

Scheme of Entrance Test:

Paper-I

Research Methodology related paper (comprising of 50 objective type questions to be attempted)

Duration : One Hour

Maximum Marks : 50

Paper-II

Subject related paper (comprising of 50 objective type questions to be attempted)

Duration : One Hour

Maximum Marks : 50

**Unit-I - Objectives and types of research:** Motivation and objectives – Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical.

**Unit-II - Research Formulation** – Defining and formulating the research problem - Selecting the problem - Necessity of defining the problem - Importance of literature review in defining a problem – Literature review – Primary and secondary sources – reviews, treatise, monographs-patents – web as a source – searching the web - Critical literature review – Identifying gap areas from literature review - development of working hypothesis.

**Unit-III - Research design and methods**– Research design – Basic Principles- Need of research design -- Features of good design – Important concepts relating to research design – Observation and Facts, Laws and Theories, Prediction and explanation, Induction, Deduction, Development of Models. Developing a research plan - Exploration, Description, Diagnosis, and Experimentation. Determining experimental and sample designs.

**Unit-IV - Data Collection and analysis:** Execution of the research - Observation and Collection of data - Methods of data collection – Sampling Methods- Data Processing and Analysis strategies - Data Analysis with Statistical Packages - Hypothesis-testing - Generalization and Interpretation.

**Unit-V - Reporting and thesis writing** – Structure and components of scientific reports - Types of report – Technical reports and thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports – Illustrations and tables

## PAPER II- TOURISM MANAGEMENT

### Unit-I

Tourist / Visitor/ Traveller/ Excursionist- definition and differentiation.

Tourism recreation and leisure inter-relationship(s).

Tourism components, Elements and infrastructure.

Types and typologies of Tourism .

Emerging concepts: Eco / rural/farm/ green/ wildness/sustainable/special interest tourism.

International Tourism Trends in different regions: Growth and development over the years and factors responsible therein.

Changing market-destination patterns, Traffic flows/ receipt trends.

Travel motivator and deterrents. Pull and Push forces in tourism.

Linkages and Channels of distribution in tourism

Tourism organization/ Institutions: Origin, Organization and functions of WTO, PATA, IATA. ICAO, FHRAI, TAAI, IATO.

### Unit-II

**Natural Tourism resources in India:** Existing use patterns vis-à-vis potential with relation to varied landforms (Mountains, deserts, beaches, coastal areas and Islands), Water bodies and biotic wealth (flora- fauna).

Popular tourist destination for:

**Land based** (soft/ hard trekking, ice skiing mountaineering, desert safaris, car rallies, etc).

**Water based** (rafting, kayaking, canoeing, surfing, water skiing, scuba/scuba diving) and

**Air based** (para-sailing, para-gliding, ballooning hand-gliding and micro-lighting etc.)

Tourism in National Parks, wildlife sanctuaries and biosphere reserves (case of Dachigham Corbett/ Dudhwa/ Kaziranga/ Kanha Gir/ Ranthambhor/ Mudumalat/ Sunderbans/ Shivpuri/ Manas.

### **CULTURAL TOURISM RESOURCES IN INDIA:**

Fundamentals of Indian culture and society

Culture- Tourism relationship

Architectural Heritage of India: Hindu, Buddhist, Jain and Islamic architecture of India

Major festivals and fairs of India; Dance and Music in India  
Religion / religious observances and important pilgrim destinations

### **Unit-III**

**Travel Agency and Tour operations Business:** Origin, Growth and development; Definition, Differentiation and linkage; Organization and functions- Travel information counseling, Itinerary preparation, Reservation, Tour costing/ pricing. Marketing of tour packages, Income sources

**Airplanes Ticketing:** Orientation perspective of ticketing- ABC codes, Flight schedules, flying time and MPM/TPM calculation, TIM (Travel information Manual) consultation, Routine and itinerary preparation, Types of fare, Fare calculation and rounding-up. Currency conservation and payment modes, issuance of ticket.

Requirements for setting up travel agency and tour operations business, Approval from organization and institutions concerned, Incentives available in Indian context, Constraints and limitations

### **Unit-IV**

**Tourism Planning:** Origin, concept and approaches

Level and types of tourism planning- Sectoral, Spatial, Integrated, complex, Centralized and Decentralized

Product life cycle theories and their applicability in tourism planning, Urban and rural tourism planning

Tourism planning and policy perspectives; planning at national state and regional levels

India's tourism policies

Tourism planning process: Objectives setting, Background analysis, Detailed research and analysis, synthesis, Goal setting and Plan formulation, Evaluation of tourism project- Project feasibility study; plan implementation, Development and monitoring. Tourism master plan.

Tourism impacts and needs for sustainable tourism planning: Socio- cultural, Economics and physical; Tourism carrying capacity and environmental impact analysis (EIA)

### **Unit-V**

**Marketing:** Core concepts in marketing; Needs wants, Demands, Products, market, Marketing management philosophies- Production, Product, selling Market and Societal perspectives. Economic importance of marketing.

**Tourism marketing:** Service characteristics of tourism, Unique features of tourist demand and tourism product, Tourism marketing mix.

**Analysis and selection of market:** Measuring and forecasting tourism demand: forecasting methods, managing capacity and demand. Market segmentation and positioning.

**Developing marketing environment,** Consumer buying behaviour, competitive differentiation and competitive marketing strategies, New product development. Product life cycle, Customer satisfaction and related strategies in internal and external marketing; Interactive and relationship marketing.

Planning marketing programmes: Product and product strategies; Product line, product mix, Branding and packaging. Pricing; consideration, approaches and strategies. Distribution channels and strategies.

**Marketing of Tourism Services:** Marketing of Airlines, Hotel, Resort, Travel, Agencies and other tourism related services- Challenges and strategies.

**Marketing skills for Tourism:** Creativity-Communication- Self motivation- Team building- personality development.