# SYLLABUS

## Ancient History, Culture and Archaeology (01)

**Early Cultures and Civilizations of India**

Definition of Archaeology and relation with other disciplines; Palaeolithic Cultures : Salient features, Geographical distribution, Belan Valley, Son Valley; Mesolithic Cultures: Salient features, Geographical distribution - Vindhyas, Ganga Plains; Neolithic Cultures: Salient features, Geographical distribution-South India, Vindhyas and Ganga Plains; Harappan Civilization : Origin and extent, salient features, chronology and decline;

**Chalcolithic Cultures-**

(a) Central India and Deccan: Kayatha Culture, Ahar Culture, Jorwe Culture
(b) Copper-Hoards and Ochre Colour Pottery (OCP)

Iron Age : Antiquity of Iron ; PGW and NBPW Cultures; Sites: Atranjikhera, Hastinapur, Kausambi, Taxilla, Arikamedu;

**Paper-II: History of India upto the Kushanas (C. 600 B.C.-C.319 A.D.)**

Sources: Literary Indian and Foreign sources Epigraphic Numismatic Archaeological sources Early State Formation

The Mahajanapadas: Rise of Magadha from Bimbisara to Mahapadma Nanda, Persian Invasion, Alexander's Invasion, bases and features of monarchical states; Nature of Republics

Mauiyan Empire and its Decline, Magadhan Expansion in the time of Chandragupta Maurya - administration, society and economy in the Mauryan Period; Asoka and his Dhamma; Decline of the Mauryan Empire.

Political Fragmentation C. 200 BC - AD 300 Early History of Sungas and Satavahanas Achievements of Pushyamitra Sunga and Gautamiputra Satkami Saka-Satavahana Struggle, Decline of Satavahana dynasty

Foreign Invasions and Dynasties: Indo-Greeks, Sakas, Pahlavas, and Kusanas : Kaniska -I : date and achievements

**Outline of Ancient World Civilizations**

Earliest Civilizations-I Egyptian Civilization: Political development under the Pharaohs; Egyptian Religion, Art and Intellectual Achievements

Earliest Civilizations-II:

Mesopotamian Civilizations: Salient features Sumerian Civilization Babylonian Civilization

Assyrian Civilization Chaldean Civilization

Greek Civilization Homeric Age

Periclean Age : Contribution of Pericles

Salient features of Hellenic and Hellenistic Civilizations Roman Civilization

Julius Caesar and Augustus - Their contributions Roman Culture : Law, Art, Literature,

Religion and Science; Roman Legacy

Development of Christianity under Roman Empire.

Ancient Palestine, Iran and China:

Achaemenid Empire; Zarathustra and his reforms

Parthian Civilization, Sassanian Civilization

Chou and Chin Periods: Cultural Achievements Confucius & Lao-Tzu History of Ancient India (C 319 AD to 1200 AD) Gupta Dynasty

Gupta Rulers their achievements: Chandragupta-I, Samudragupta, Chandragupta-II, Kumargupta I, Skandagupta and the Huna invasion , Decline of the Guptas, Vakataka-Gupta Relation, Huna invasion, Maukharis, Later Guptas

Harsha Career and achievements, relation with contemporary rulers, (Harsha's relationship with Pulakesin -II), visit of Hiuen Tsang

Gurjara-Pratihar, Pala, Rastrakuta; Political History of Gurjara Pratihar, Pala and Rastrakuta, Tripartite struggle, Cultural Achievements

Pallava Dynasty; Political and Cultural Achievements of Pallavas Chalukya Dynasty; Political and Cultural Achievements of Chalukyas of Vatapi, Vengi and' Kalyani Chola Dynasty Political History, Administration, relations wilth contemporary powers, Cultural achievements.

**Indian Culture**

Foundation of Indian Culture; Sources of Study; Definition and Characteristics; Harappan Civilization; Vedic Culture;

Main Features of Ancient Indian Society; Varnasrama System; Ancient Indilan Education System, Taxila, Nalanda and Vikramashila; Position of Women; Guilds and their roles, Ancient Indian Religions; Saivism; Vaisnavism; Jainism; Buddhism;

Socio-Spiritual Streams; Sankaracharya; Bhakti Movement; Interaction between Islam and Indian Society with special reference to impact on Indian society Social and Religious Movements in Nineteenth Century India.

**Concepts and Currents in History**

Nature and characteristics of history, objectivity and subjectivity in history, causation in history, history is science or art.

Introduction to approaches of history - Oriental, (Colonial), Nationalist, Marxist

Philosophy of history with special reference to Hegel, Ranke, Karl Marx, Spengler, Toyanbee Nationalism : Germany, Italy, India, Imperialism and colonialism : World War-II and Revolutions - Russian and Chinese.

**Ancient Indian Art and Architecture**

Beginnings of Indian Art; Characteristic Features of Ancient Indian Art; Pre-historic Art; Harappan Art & Architectur

Mauryan, Sunga and Kusana Art; Asokan Pillars, Capital Figures, Folk Art; Stupa: Bharhut, Sanchi, Amrawati; Rock-cut Cave Archiltecture (Chaitya/Vihara)-Karle, Bhaja; Kusana Art: Evolution of Buddha Images Mathura Style Gandhara Style;

Gupta Art: Essential features; Beginning of temple Architecture-Bhitargaon temple; Deogarh temple; Ancient Indian Paintings with special reference to Ajanta Temple architectural styles: Nagara, Dravid, Besara

Art & Architecture under; Chalukyas : Aihole, Pattadakal; Chandela: Khajuraho temples; Orissan Temples : Lingaraja and Konark

Art & Architecture under; Rashtrakutas: Kailash Temple of Elora; Pallavas: Rathas of

Mahabalipuram; Cholas : Brihadishwara Temple of Tanjavur.

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# ECONOMICS (02)

Measures of Dispersion-Range, Quartile/Percentile Deviation, Mean Deviation, Standard Deviation, Coeeficient of Variation, Lorenz Curve, Measures of skewness and Kurtosis.

Correlation: Linear Rank, Index Numbers: Nature, Construction, Limitation, Importance, Construction of Index Numbers: Simple, Weighted and Price Relative Methods.

**Macro Economics:**

National Income: its Measurement and Limitations, Nature of National Income Accounts in Closed and Open Economy, Uses of National Income Analysis, Social Accounting, Environmental Accounting.

Theory of Employment, Say's Law of Market, Classical Theory, Keynesian Critique of Classical Theory, Simple Keynesian Theory of Emplolyment and Income Determination, Investment function. Keynesian Consumption Function, Concept of Investment Multiplier.

Nature and Causes of Trade Cycles, Theories of Trade Cycle: Hawtrey, Hayek,

Schumpeter. Inflation: types, causes and impact, Inflation Employment Tradeoff: Phillips Curve, Macro Theory of Distribution: Ricardo, Marx and Kaldor. Theories of Growth: Harrod and Domar Growth Models. Population and Development, Model of H. Leibenstein, the Low Level Equilibrium Trap: Nelson;

**Development and Planning:**

Development: Meaning, Measurements and Indicators of Development. PQLI, HDI, GDI, GII, Causes of Under-development. Circular Causation: Myrdal and Nurkse, Over-Population. Technological Backwardness, Environment and Development.

Selected Theoretical Prescriptions of Development: Rostow's Stages of Growth, Problem of Choice of Technique. Models of Development: Balanced vs Unbalanced Growth, Hirschman, Rosenstein Rodan, Two Gap Theory.

Measures for Development, Augmentation of Savings, Investment Strategy, Capital Accumulation, Improvement in Technology and Industrialisation, Surplus Labour as a Source of Capital Formation-Lewis and Nurkse, Choice of Technique, Human Capital and Economic Development. Sustainable Development: Meaning and historical Evolution.

**Money and Public Finance:**

The Quantity Theory of Money: Fisher and Cambridge Approaches. Keynes' Fundamental Equations. An Elementary Treatment of Saving and Investment Approach. Concepts and Components of Money Supply.

Theory of Commercial Banking, Theory of Credit Creation, Credit Multiplier. Theory of Central Banking, Types of Banks- Development, Cooperative, Universal etc. Techniques of Credit Control, The Reserve Bank of India, Control of Commercial Banks & Control of Credit.

Public Finance and Private Finance: Concepts and Problems, Public and Private Goods, Principle of Maximum Social Advantage. Public Expenditure: Nature and Effect. Federal Finance concept, Federal Finance in India, Division of Resources, Finance Commission: Role and objectives.

Taxation: Progressive, Regressive & Proportionate. Direct and Indirect Taxes. Principle of Taxation: Ability to Pay. Least Aggregate Sacrifice, Incidence, Impact and Shifting of Taxation in Perfect Competition and Monopoly.

**Economic Analysis:**

The Theory of Imperfect Competition, Duopoly, Oligopoly, Collusive and Non-collusive Oligopoly, Cournot, Bertrand, Edgeworth, Stackleberg, Chamberlin's Small Group Oligopoly Model, The Kinded Demand Curve, Cartels: Joint Profit Maximization and Market Sharing Cartels.

Monopolistic Competition Models, The Criticism of Marginalist Approach to the Theory of the Firm, Welfare Economics: The Criteria of Social Welfare, The National Income Criteria, The Hedonist; The Cardinal Approach to Social Welfare, Pareto Optimality, Kaldor-Hicks Compensation Principle; Bergson's Social Welfare Function.

**International Economics:**

Basis of International Trade. Theories of International Trade: Adam Smith, Ricardo. J.S. Mill'sTheory of Reciprocal Demand. Marshall-Edgeworth Offer Curve, Haberler's Opportunity Cost Theory; Heckscher's Critique of Classical Theory.

Terms of Trade and Gains from Trade: Kinds of Terms of Trade, Factors Influencing Terms of Trade, Prebisch Singer Model, Relation between Terms of Trade and Gains from Trade. Immiserizing Growth Theory. Balance of Payments: Meaning, Definition, and Illustration: Disequilibrium in BOP

Exchange Rates: Purchasing Power Parity Theory, Balance of Payments Theory, Fixed and Flexible Exchange Rates, Spot and Forward. FreeTrade and Protection, Exchange Control Infant Industry Argument, Instruments of protection: Tariff, Quota and Devaluation, Exchange Control.Measures for correction in BOP.

**India's Economic Policy:**

General Objectives of Economic Policy in Developing Countries.

Unemployment and Poverty: A General Overview & Policies

Population Policy : National Population Policy and Population Policy of Uttar Pradesh. Environmental Problems & National Environment Policy Industrial Policy : Role and Objectives Industrial Policy of India

Private and Public Sector Competition Act

Micro, Small and Medium Enterprises Policies Energy Sector: Problems and Energy Policy Agricultural Policy in India: Objectives and Overview Community Development Project and Panchayati Raj Rural Development Programme Agricultural Price Policy Food Policy and The Public Distribution System

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# EDUCATION (03)

1. **Principles of Education:** Meaning and scope of education; Aims of education; Approaches to education; Agencies of education; Curriculum; Educational Plannning.

2. **Problems of Indian Education:** Primary education, secondary education, higher education, adult education; National Policy on Education; Language Controversy.

3. **Educational Philosophy & Sociology:** Nature, scope and need of philosophy of education; Naturalism, Idealism, Pragmatism, Realism, Existentialism; Educational Sociology; Culture and education; Social Satisfaction; Social Mobility' Social Changes; Futurology.

4. **Educational Psychology:** Nature, scope and methods and educational psychology; Growth and development; Individual difference; Intelligence;' Creativity; Personality; Learning; transfer of learning; Motivation; Group dynamics

5. Measurement, evaluation and action research in Education, Measure of Central Tendency and Standard Deviation.

6. **Indian and Western Education:** Sir Syed Ahmed Khan, Madan Mohan Malviya, Tagore, Vivekanand, Mahatama Gandhi, Radhakrishnana, Plato, Rousseau, Dewey, Russel.

7. Environmental education; Educational techonology; Distance education; Value education; Peace education; Human rights education; Population education

# ENGLISH LITERATURE (04)

**Note : Candidates can attempt either English Literature or English Language question paper.**

Multiple choice questions based on the following in the ratio of 25:25:50 from the syllabic of B.A. Part I, II & III respectively.

**POETRY :**

1. William Shakespeare :
   (a) Sonnet 29: "When in disgrace with fortune and men's eyes"
   (b) Sonnet 138 "When my love swears that she is made of truth"

2. John Done: "Canonization"
3. John Milton: Paradise Lost (Satan's Speech )
4. John Dryden: Absalom and Achitophel, Lines 150-197. (False Achitophel).
5. Alexander Pope: "Essay on Man" (Lines 1-18)
6. William Blake: The Nurse's Song
7. William Wordsworth: (a) "Tintern Abbey", (b) "The World is too much with us"
8. Percy B. Shelley: (a) "Ode to the West Wind" (b) " A Lament"
9. John Keats: (a) "Ode to a Nightingale", (b) " La Belle dame sans merci"
10. Sarojini Naidu: The Flute Player of Brindaban
11. Toru Dutt:" Baughmaree"
12. Rabindra Nath Tagore: From Gitanjali : (a) 11th, Leave the Chanting, (b) 12th Fruit Gathering.
13. Nissim Ezikiel: "Background", "Casually"
14. Frost: " Stopping by the Woods"
15. Walt Whitman: "O Captain, My Captain!"
16. Alfred Lord Tennyson: (a) "Break, Break, Break" ; (b) " Ulysses"
17. Robert Browning: (a) " My Last Duchess" ; (b) "Prospice"
18. Matthew Arnold: (a) "Dover Beach"; (b) " Memorial Verses"
19. Thomas Hardy: (a) " The Darkling Thrush"; (b) " The Voice"
20. Gerard Manley Hopkins: (a) "Pied Beauty" (b) "Thou Art Indeed Just Lord . . "
21. W. B. Yeats: (a) "The Second Coming" ; (b) " Prayer for My Daughter"
22. T. S. Eliot: "Love Song of Alfred J. Prufrock"
23. W. H. Auden: "In Memory of W. B. Yeats"
24. Adil Jussawala: "Sea Breeze, Bombay"
25. Kamla Das: "An Introduction"
26. Keki N. Daruwalla: "Ghagra in Spate"

27. Derek Walcott (West Indian): "A Far Cry From Africa"
28. Wole Soyinka (Nigerian): "Dragonfly at My Window Pane"
29. Amiri Baraka (African-American): "Wise I"
30. Judith Wright (Australian): "Bora Ring"
31. A. D. Hope (Australia): "Australia"
32. Michael Ondaatje (Sri Lanka/Canada): "Letters and Other Worlds"
33. Eunice de Souza (India): "Autobiographical"
34. Agha Shahid Ali (India): "Postcard from Kashmir" and "A Lost Memory of Delhi"
35. A. K. Ramanujan (India) "Love Poem for a Wife I"
36. Arun Kolatkar (India) "The Priest's Son" and "The Butterfly"
37. Sylvia Plath (America): "Mirror" and "Daddy"
38. Gwendolyn Brooks (America): "The Lovers of the Poor"
39. Emily Dickinson (America): "After Great Pain, A Former Feeling Comes"
40. Sherman Alexie (America): "On the Amtrak from Boston to New York City"
41. Lorna Dee Cervantes (America): "Refugee Ship"
42. Practical Criticism : There will be multiple choice questions (MCQs) based on unseen passages of prose and B. A. Part III: English Literature
43. DRAMA :
    George Bernard Shaw: *Arms* and the Man.
    Mahesh Dattani: Where There's a Will
    The following plays are prescribed:
    William Shakespeare: Macbeth
    William Shakespeare: The Merchant of Venice
    T. S. Eliot: Murder in the Cathedral
    Eugene O'Neill: Desire Under the Elms
    Harold Pinter: The Birthday Party
    Girish Karnad: Hayavadana

**Prose and Fiction:**

An Anthology of English Prose edited by the Dept. of English & MEL, University of Allahabad, Macmillan

The following **essays** are prescribed:

1. E. V. Lucas: "Tight Corners"
2. A. G. Gardiner: "In Defence of Ignorance"
3. Robert Lynd: "Student"
4. G. K. Chesterton: "On the Pleasure of No Longer Being Very Young"
5. George Orwell: "Reflections on Gandhi"
6. Aldous Huxley: "Pleasures"
7. J. B. Priestly: "On Doing Nothing"
8. Bertrand Russell: "The Road to Happiness"
9. Richard Wright: "Twelve Million Black Voices"
10. A. C. Benison: "The Art of the Essayist"

11. Francis Bacon: “Of Studies”
12. Proverbs, Chapter XV. (From The Bible)
13. Addison “Will Wimble”
14. Steele “The Spectator Club”
15. Goldsmith: “Beau Tibbs”
16. Johnson, “Letter to Chesterfield”
17. Lamb, “Dream Children”
18. Charlotte Perkins Gilman, “The Yellow Wallpaper”
19. Anita Desai: “A Farewell Party”
20. James Thurber “The Secret Life of Waltermity
21. Katherine Mansfield “The Fly”
22. Jane Austen: Pride and Prejudice
23. Charles Dickens: David Copperfield
24. E. M. Forster: A Passage to India
25. Salman Rushdie : Haroun and the Sea of Stories

The following novel is prescribed : R. K. Narayan: The Guide, George Orwell: Animal Farm

# ENGLISH LANGUAGE (05)

**FOR B. A. ENGLISH LANGUAGE SYLLABUS: Please see University website www.allduniv.ac.in (http://allduniv.ac.in/department/english and modern european languages)**

**(CLICK ENGLISH DEPARTMENT AND OPEN SYLLABUS COLUMN)**

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# HINDI (06)

Hindi Sahitya ka Itihas, Bhasha Vigyan, Bhartiya Kavyashastra, Pashchatya Kavyashastra, Kavyabhasha, Aalochana aur Shahitya Chintan ki Nai Dishayen.

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# MEDIEVAL AND MODERN HISTORY (07)

SECTION A : HISTORY OF THE MODERN WORLD (1453-1945) : A survey of the Political, Social Economic and Cultural history of the Modern World,

SECTION B : HISTORY OF MEDIEVAL INDIA (1206-1740)

SECTION C : HISTORY OF THE MODERN INDIA (1740-1950)

# M. A. (MUSIC) / MPA [08 (A), (B) & (C)]

## VOCAL – 08(A)

1. **Detailed study of the following Ragas:**

   Puriya, Marwa, Jai-Jaiwanti, Suddha Kalyan, Deshkar, Kamod, Chayanat, Todi, Multani, Miyan-Malhar, Gound-Malhar, Adana, Darbari Kanhada, Basant, Paraj, Puriya Dhanashri, Shri, Hindol, Suddha Sarang, Madhuwanti.

2. **Taal**

   Rupak, Teevra, Dadra, Kaharwa, Trital, Jhaptal Ektal, Dharmar, Ada Chartal, Pancham Sawari, Gaj jhampa, Chartala, Sooltal, Deepchandi, Jhoompa, Tilwada.

3. Details introduction of all the Ragas and Taalas mentioned above.
4. Comparative study of the Samprakit Ragas and Taalas.
5. Study of Alpatva and Bahutva, Tirobhav and their use and importance.
6. Laya and layakari- Different types of Layakaries, Dugun, Tigun Chaugun and Ada.
7. Different styles of Gayaki - Dhruvapad, Dhamar, Tappa, Thumari and Chaiti.
8. Brief study of different Gharanas of Vocal Music.
9. Life sketch and contribution of Eminent Musicians and Vocalist.
10. Vibration and frequency, pitch and its relation with vibrator, Amplitude, (Swaymbhu Swear); Consonance and Dissonance, Main Types of chords, Absorption, echo, Reverberation and Resonance of sound, Placement of Sudha and Vikrit Swars on different shruties according to Lochan, Ahobal, Pundarik, Ramamatya, Somnath.
11. Notation system of Bhatkhande and Vishnudigambar, various types of intervals of notes. Different Musical scales, comparative study of Notation System of Bhatkhande and Western Music, placement of notes on „Veena' according to Pt. Srinivas, Comparative study of Northern Sothern Talapaddhaties.
12. Biographies of Bhatkhande, Vishnudigambar, Tansen, Ustad Vilayat Khan, Ameer Khusroo, Pt. Ravi Shankar, Pt. Ram Sahai, Ahmad Jan Thirakwa, Nana Sahib Pansse.
13. History of Music and classification of Ragas and Taals. History of Music of Ancient period up to 13th century. Short History of Music of Medieval and Modern periods. Comparison of Hindustani and Karnataka Music Systems. Gram, Moorchana its kind and their importance. Kind of Gamaka. Brief knowledge of Different Gharanas.

## INSTRUMENTAL SITAR - 08(B)

1. **Detailed study of the following Ragas:**
   Puriya, Marwa, Jai-Jaiwanti, Suddha Kalyan, Deshkar, Kamod, Chayanat, Todi, Multani, Miyan-Malhar, Gound-Malhar, Adana, Darbari Kanhada, Basant, Paraj, Puriya Dhanashri, Shri, Hindol, Suddha Sarang, Madhuwanti.

2. **Taalas**
   Rupak, Teevra, Dadra, Kaharwa, Trital, Jhaptal Ektal, Dharmar, Ada Chartal, Pancham Sawari, Gaj jhampa, Chartala, Sooltal, Deepchandi, Jhoompa, Tilwada.

3. **Details introduction of all the Ragas and Taalas mentioned above.**
4. **Comparative study of the Samprakit Ragas and Taalas.**
5. **Study of Alpatva and Bahutva, Tirobhav-Avirbhav and their use and importance.**
6. **Laya and layakari- Different types of Layakaries, Dugun, Tigun Chaugun and Ada.**
7. **Different styles and Baj - Maseetkhani, Razakhani, Firozkhani etc.**
8. **Brief study of different Gharanas of Sitar.**
9. **Life sketch and contribution of Eminent Musicians and Instrumentalists.**
10. **Vibrat**ion and frequency, pitch and its relation with vibrator, Amplitude, (Swaymbhu Swear); Consonance and Dissonance, Main Types of chords, Absorption, echo, Reverberation and Resonance of sound, Placement of Sudha and Vikrit Swars on different shruties according to Lochan, Ahobal, Pundarik, Ramamatya, Somnath.
11. Notation system of Bhatkhande and Vishnudigambar, various types of intervals of notes. Different Musical scales, comparative study of Notation System of Bhatkhande and Western Music, placement of notes on 'Veena' according to Pt. Srinivas, Comparative study of Northern Sothern Talapaddhaties.
12. Biographies of Bhatkhande, Vishnudigambar, Tansen, Ustad Vilayat Khan, Ameer Khusroo, Pt. Ravi Shankar, Pt. Nikhil Banerjee.
13. History of Music and classification of Ragas and Taals. History of Music of Ancient period up to 13th century. Short History of Music of Medieval and Modern periods. Comparison of Hindustani and Karnataka Music Systems. Gram, Moorchana its kind and their importance. Kind of Gamaka. Brief knowledge of Different Gharanas.

## INSTRUMENTAL TABLA - 08(C)

1. **Detailed study of the following Taalas :** Trital, Jhaptal, Rupak, Teevra, Sooltal, Ektal, Chartal Basant, Pancham Swari, Gaj Jhampa, Dhamar, Laxmi, Rudra, Shikhar, Brahma, Kurnbha, ganesh, Matt, Dadra and Kaharwa, Jat Taal, Deepchandi Taal.
2. Kayada, Palta, Peshkar, Rela, 'Laggi-Ladi', Paran, different types of Chakkardar, Tihai, and paran, Tripalli, Choupalli, Nauhakka, Jhoolna ke Bol, Gat- Farad, Mukhda, Mohra.

3. Ten Varnas of Tabla.
4. Study of Sam Matrik and Samprakrit Taalas.
5. Different Gharanas of Tabla playing with their style and Baj.
6. Life sketch and contribution of Eminent Musicians and Musicologist.
7. Laya-Layakari, different kinds of Layakaries, Dugun, Tigun, Chaugun, Aad, Kuada, Biyad etc.
8. Life sketch and style of playing leading Tabla Artists, Padam Bhushan Pt. Samta Prasad, Padam Vibhushan Pt. Kishan Maharaj .
9. Vibration and frequency, pitch and its relation with vibrator, Amplitude, (Swaymbhu Swear); Consonance and Dissonance, Main Types of chords, Absorption, echo, Reverberation and Resonance of sound, Placement of Sudha and Vikrit Swars on different shruties according to Lochan, Ahobal, Pundarik, Ramamatya, Somnath.
10. Notation system of Bhatkhande and Vishnudigambar, various types of intervals of notes. Different Musical scales, comparative study of Notation System of Bhatkhande and Western Music, placement of notes on 'Veena' according to Pt. Srinivas, Comparative study of Northern Sothern Talapaddhaties.
11. Biographies of Bhatkhande, Vishnudigambar, Tansen, Ameer Khusroo, Pt. Ram Sahai, Ahmad Jan Thirakwa, Nana Sahib Panse.
12. History of Music and classification of Ragas and Taals. History of Music of Ancient period up to 13$^{th}$ century. Short History of Music of Medieval and Modern periods. Comparison of Hindustani and Karnataka Music Systems. Gram, Moorchana its kind and their importance. Kinds of Yati. Brief knowledge of Different Gharanas.
13. Gharana of Tabla Tabla Aur Pakhawaj Ka Tulnatmak Adhyayan. Classification of Instruments.
14. Taal Ka Manovaigyanik Prabhav.

# M.A. (PAINTING) (09)

## M.A. Painting:

**Theory :** (conducted by the University)

**Syllabus :** Aesthetics & Art Appreciation (Indian and Western)

History of Indian Art (Pre-history to Modern)

History of Western Art (Pre-history to Modern)

Folk, Tribal and current trends in Art Scenario.

**Practical : (conducted by the Department)**

For admission in M.A. in Painting candidate has to appear in Practical Drawing Test of 100 marks. Time: 120 minutes of 100 marks in any medium.

*(The candidates are advised to contact the Head, Visual Arts for Practical Test)*

# PHILOSOPHY (10)

1.Ethics

2. Indian Philosophy

3.Western Philosophy

4. Logic

5.Theory of Knowledge

6. Philosophy of Religion

7.Socio-Political Philosophy

# POLITICAL SCIENCE (11)

**POLITICAL THEORY :**

Definition, Nature and Scope of Pol. Science, Nomenclature relation with other social sciences, Different approaches idealistic, Individualistic, Liberal, Social Welfare, Contemporary Libertarian Concept, Gandhian Concept and Marxian view of state, Sovereignty, Nation and Nationalism , Challenges before nation-state, Globalisation and emergence of civil society, Concept of liberty, equality, law, rights, justice, punishment and citizenship, evolutionary socialism, Marxism, Fascism, Democracy and Communitarianism.

**INDIAN GOVERNMENT AND POLITICS:**

The constituent assembly, Preamble, Main features of Indian Constitution, Procedure to amend the Constitution, Federalism, Fundamental Rights, Directive Principles of State Policy, Fundamental Duties.

President, Prime Minister and Council of Ministers, Parliament, Judiciary, Judicial, Review and Activism, Governor, Chief Minister, Council of Ministers, State Legislature, Panchayati Raj and Urban Local Bodies, Party System in India.

**WESTERN POLITICAL THOUGHT:**

Features of Ancient Greek Political Thought, Plato, Aristotle, Aquinas, Machiavelli, Bodin, Hobbes, Locke and Rousseau, Bentham, Mill, Green, Hegel, Marx, Lenin, Mao.

**COMPARATIVE GOVERNMENT AND POLITICS:**

Meaning, approaches, nature and scope of comparative government and politics. Constitutionalism, Rule of Law, Legislature Executive and Judiciary, Oragnisation of Government- Unitary, Federal, Parliamentary and Presidential Democracy, Democracy Dictatorship, Local Self Government, Political Culture and Socialization, Political Parties, Pressure Groups, Electoral Process, Public opinion and Bureaucracy.

**INDIAN POLITICAL THINKERS:**

Features of Ancient Indian Political Thought, Political Ideas of Manu, Kautilya, Features of Jain and Budhist Political Thought, Political Ideas of Mahabharat, Indian Renaissance and Political Ideas of Raja Ram Mohan Roy, Dayanand and Vivekanand, Political Ideas of Tilak, Arvindo Ghosh, M.N. Roy and Jai Prakash, Jawahar Lal Nehru, Mahatama Gandhi and B.R. Ambedkar.

**IINTERNATIONAL RELATIONS:**

The study of International Relations, Role of State and Non-State Actors, Cold War, Feature of present world order, Globlisation and impact on world politics, Problem of Third World

Security, NAM, North-South Dialogues, ASEAN and SAARC, International Terrorism, Nuclear Proliferation, Disarmament and Arms Control, Collective Security, Indian Foreign Policy, Indo-US Relations.

**INDIAN ADMINISTRATION:**

Meaning, scope and significance of Public Administration, NPA and NPM Organisation, Ecology of Indian Administration, Structure of organisation (Central and Cabinet Secretariats, P.M.O.), Centre-State Relations, Public sector undertakings, Parliamentary Control over financial Administration, Growth of civil services in India, D.M. and O&M, 73$^{rd}$ - 74$^{th}$ Constitutional amendment Acts, welfare administration for- S.C., S.T. and Women, Generalist- Specialist, Controversy, Problem of corruption, Lokpal and Lok Ayukta, Minister-Civil Servant relationship.

Note: For details please see the syllabus of U.G. Pol. Science University of Allahabad.

# SANSKRIT (12)

**Group - A**

(i) AbhijnanShakuntalam-upto VAct

(ii) Poorva Megh- Upto 30 slokas

(iii) Kiratarjuniyam-Prathamah sargah

(iv) Kadambari Kathapuram Prabhatvarna Paryanta

(v) Following Suktas of Rigvedas:

- (a) Vishvedeva Suktam,
- (b) Vishun Suktam
- (c) Indra Suktam
- (d) Prajapati Suktam
- (e) Purush Suktam
- (f) Vak suktam
- (g) Shivsankalpa Suktam From Shukla Yajurveda)

(vi) Sangya & Sandhi prakaranas of Laghu Siddhanta kaumudi

(vii) Niti Shatak- Upto 30 Slokas

**Group - B**

(i) Sahitya Darpan (First & Second Parichchheda only)

(ii) Uttar Ram Charitam- Upto Third Act

(iii) Tark Sangraha

(iv) Sri Mad Bhagwad Geeta (Second, Third & Nineth Chapter only)

(v) Karak Prakaran of Madhya Siddhant Kaumudi (Practical Knowledge only)

# SOCIOLOGY (13)

**EMERGENCE OF SOCIOLOGY AND PIONEER THINKERS:** Emergence of Sociology (Definition, Nature, Scope and Subject Matter of Sociology) and its Relationship with other Social Sciences; Works of Comte (Positivism), Spencer (Social Darwinism), Durkheim (Social Facts, Solidarity, and Suicide), Weber (Social Action, Authority, Idea, Type, Protestant Ethics and the Spirit of Capitalism), Marx (Materialistic Conception of History, Class Struggle, Alienation), Pareto (Circulation of Elites), Parsons (Social Action and AGIL) and Merton (Functional Analysis).

**BASIC CONCEPT:** Society, community, Culture, Civilization; Socialization - Agencies and Theories; Social Structure and Function; Institution and Association; Social Group and Its Types; Customs, Norms, Values, Sanctions and Laws; Status, Role and its Types.

**SOCIOLOGICAL PERSPECTIVES:** Evolutionary, Structural, Functional, Conflict and Interactional.

**INSTITUTIONS :** Kinship and Its Types, Forms and Usages; Family and Its type; Marriage and Its Types; Economy and Its Forms-Urban, Rural and Tribal Economy (Primitive communism, Concept of Property and Ceremonial Exchange among Tribes- Potlatch and Kula Ring, Division of labour, Jajmani Relations); Religion - Theories and Forms of Religion, Magic, and Religion and Science; Political - Elites and Leaders, Political Parties, Caste Panchayat and Panchayati Raj Institutions (PRIs); Education as a Social System.

**SOCIO-CULTURAL PROCESS AND CHANGES:** Cultural lag, Assimilation, Acculturation, Cooperation, Competition, Conflict; Universalization and Parochialization, Sanskritization, Westernization, Modernization and Secularization; Meaning of Social Changes and Its Types (progress, Development, Growth, Evolution and Revolution); Theories and Factors of (Demographic, Biological, Economic, Technological and Cultural) of Social Change; Approaches to Development.

**STRATIFICATION, MOBILITY AND SOCIAL MOVEMENT:** Meaning of Stratification - Its Forms and Theories (Functional, Conflict, Weberian); Social Mobility and Its Type; Meaning and Theories of Caste, Caste as a Unit and caste as a System, Dominant Caste, Changing Dimension of Caste and Class; Meaning of Social Movement and its types.

**SOCIAL RESEARCH:** Objectivity and Subjectivity in Social Sciences, Positivism and Empiricism in Sociology, Sociological, Explanations, Types of research, Steps in Social Research; Research Designs (Exploratory, Descriptive and experimental); Methodology, Method & Techniques: Ethnography, Observation, Case study, Content Analysis, Survey, Sampling, Questionnaire, Schedule and Interview; Data Analysis - Measures of central tendency, Correlation and Chi-Square.

**UNDERSTANDING INDIAN SOCIETY AND VARIOUS SOCIAL ISSUES :** Eminent, Indian Thinkers on Indian Social System; Unity in Diversity - Language, Religion, Caste and Cultural Pattern; Varnasharama System, Purushartha, Joti and Varma; Issues on Villages, Towns and Cities; tribes, Dalits, Women and Minorities, Racial and Physical Distribution of Tribes in India; tribe-Caste Continuum; Rural-Urban Continuum; Social Problems and Their remedies -

Religious, Ethnic and Regional, OBC, SC, ST, Women and Minorities, Dowry, Domestic Voilence, Intra and Inter-Generational Relations, Communalism, Terrorism and Corruption; Social Disorganization - crime and Delinquency, Theories of Crime, White Collar Crime, Theories and Types of Punishment; Nation- building and Ethnic Identities, Development induced Displacement and Environmental Issues.

# URDU (14)

Syllabus of Urdu subject (Graduation level course) of University of Allahabad

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# BOTANY (15)

Fungi; Lichens; Bacteria and Plant Viruses; Algae; Bryophyte; Pteridophyta; Gymnospermophyta; Taxonomy; Morphology & Anatomy; Life History; Plant Physiology; Plant Ecology; Cytology; Genetics; Molecular Biology; Evolution; Microbiology And Applied Microbiology; Genetic Engineering, Plant Pathology; Economic Botany; Applied Plant Anatomy; Plant Breeding; Marine Biology & Limnology; Palaeobotany and Palynology; Plant Diversification; Morphogenesis and Tissue Culture.

# CHEMISTRY (16)

**A (PHYSICAL CHEMISTRY)**

Thermodynamics, Chemical Kinetics, and Catalysis, Chain Reactions and Photochemistry, Electro-Chemistry, Atomic Structure, Gasses State, Surface Phenomena.

**B (ORGANIC CHEMISTRY)**

Bonding in Carbon Compounds, Aromaticity and Huckel's rule, Aliphatic and Aromatic

Aldehydes and Ketones (i) Optical Isomerism (ii) Geometrical Isomerism, Active Methylene Compounds, Spectroscopy U.V. Visible, IR, NMR, Cycloparaffins, Carbohydrates, Diazonium Compounds, Synthetic Polymers, Synthetic applications of Grignard reagents.

**C (INORGANIC CHEMISTRY)**

Atomic Structures and Periodic Properties, Chemical Bonding and Molecular Structure, Co-ordination Chemistry, Chemistry of Representative Elements, Transition metals including Lanthanides, Extractive Metallurgy, Environmental Pollution, Metal Ions in Biological Systems, Preparation, Properties and Structures, Inorganic Analysis.

# COMPUTER SCIENCE / MCA (17)

**PGAT 2018 Syllabus (M. Sc. Computer Science Course)**

**1. BASIC ELECTRONICS :**

**Boolean Algebra:** Decimal, Binary, Octal and Hexadecimal Numbers and their interconversion, Boolean Expressions, Truth tale representation, SOP and POS forms, Theorems of Boolean Algebra and their use in simplification of Boolean Expressions, Karnaugh map method and its use in simplification of logic expressions.

**Logic Gates and Logic Families:** Basic logic gates, Elementary idea of commonly used logic families, Working of Standard TTL logic gates, , Implementing Logic circuit using Basic/Universal logic gates.

**Combinational Circuits and their Implementation:** Adder, Subtractor, Parity Generator, Encoder, Decoder, Multiplexer and De-multiplexer Circuits, Combinational circuit design using multiplexer.

**Sequential Circuits and their Implementation:** Characteristics & Excitation table of RS,JK, T and D Flip flop, Clocked and Edge triggered Flip flops; Ripple counters and Synchronous counters; Binary, BCD and modulo counters, Shift Registers.

**2. COMPUTER FUNDAMENTALS :**

**Generation of Computers:** Functional Block Diagram of a Computer; Types of Computer, Hardware and Software, Components of a system: memory, CPU, I/O, Basic I/O methods, Generations of Computer, Generation of Programming languages, Language Translators - Compiler, Interpreter & Assembler, Hardware and Software, Application vs System Software, Operating System and its functions. Single user, multi-user, time-shared system.

**Computer Memory:** Concept of sequential and random storage, RAM, ROM, EPROM, Auxiliary storage devices, Magnetic and optical discs. Cache memory, virtual memory.

**I/O Devices and Interfacing:** Serial and parallel communication, Interfacing, Types of buses, I/O devices- keyboard, mouse, light pen, touch screen, VDU, LCD, dot matrix, laser and ink jet printers, plotters.

**3. COMPUTER ARCHITECTURE AND ORGANIZATION :**

Data Representation, Signed numbers, fixed and floating point numbers, binary number addition, subtraction, multiplication and division, Is and 2s complement method.

**Basic Computer Organization:** CPU, Registers, ALU, System Buses, Memory organization and interleaving, memory hierarchy, Memory mapped and standard I/O, Programmed I/O, Interrupt driven I/O and DMA.

**Microprocessor Architecture:** 8085 microprocessor architecture, pin diagram, Interrupts, Instructions, Addressing modes.

**4. PROGRAMMING IN C :**

Flowchart representation, algorithm, Stages in Program development; Low, middle and high level languages; Languages translators; Syntax and logical errors.

**Features of C Language:** Variables, Data types, Operator, storage classes, Expressions, Library functions, C pre-processor, Control flow, arrays; structures; I/O operations, functions, macros, files and pointers.

**5. DATA STRUCTURE :**

Data structures, Representation and Implementation, Complexity calculation of algorithms, Linearity and Non-linearity of data structures.

**Linear Data Structures :** Arrays, Ordered lists and their representations, List operations-Insertion, Deletion, Traversal; Stacks, Queues, Priority Queues, Linked lists, Doubly linked lists, Sparse matrix, representation

**Non-Linear data Structure:** Binary Trees and their representation, Binary Tree traversals, Threaded Binary tress, Height balancing and AVL tree, union and find algorithms, Decision tree, Graphs and their representations, Graph search, Graph traversal, Connected Components and spanning trees, Shortest path.

**Searching and Sorting:** Sequential search Binary search, Hashing, Chaining and symbol tables, Collision processing, Indexed search techniques, Bubble, Insertion, Quick, Radix and Heap Sort

**6. COMPUTER NETWORKS :**

Channel capacity, Baud & bit rate; Maximum data rate of a channel; MUX:TDM, FDM; Synchronous & asynchronous transmission; Data Transmission modes

**The electrical Interface:** Attenuation & distortion sources, Signal types, Signal propagation delay, Transmission media-Wired & wireless, comparison of different transmission media, Concepts of modulation- AM, FM, PM, Digital signal modulation vs Analog signal modulation, Baseband & Broadband transmission.

**Data Networks:** Circuit switching, Message Switching & Packet switching; Virtual circuit vs circuit switching; Network topology; Linear, Circular, Star, Tree & Graph, Ethernet, Token ring, Token bus & FDDI, ATM, Role of ATM in inter-networks; Network Protocol basics; Error control & link management; data link control protocols bit oriented & character oriented protocols; OSI model TCP/IP.

**Error detection & correction:** Asynchronous data error detection; Data correction using parity, Erjor detection for synchronous transmission; Cheksum error detection; Hamming code, CRC.

**Network components:** Switches, Hubs, Concentrators, Modem, Network interface card, Repeaters, Bridges, Routes and Gateways.

# PHYSICS (18)

Thermodynamic equilibrium, Zeroth law, first law, second law, reversible process, Carnot's theorem, entropy and disorder; thermodynamic relations and applications. Clausius-Clayperon equation, phase transitions of first and second order.

Radiation as e.m. wave, Kirchhoffs law. black body radiation, pressure and energy density, Stefan-Boltzmann law, Planck's law and its limiting cases. Phase space, ensembles, equilibrium and fluctuation, entropy and probability, entropy of a perfect gas, microcanonical, canonical and grand canonical ensembles, partition function, Boltzmann distribution, B.E. and FD. statistics, simple applications.

Gauss' Law, Blot-Savart law, Vector Potential, Faraday law. Amperes circuital law, generalization of Ampere's law by Maxwell, Maxwell's equations and its solution in free space and simple dielectrics. Poynting theorem, plane wave propagation in metals and plasmas.

**Interference Diffraction Special theory of Relativity Uncertainty principle**

Linear Harmonic oscillator, Angular momentum, commutation relations, Ladder operators eigenvalues of I, and L Z, Parity operator Hydrogen atom problem, Pauli spin matrices.

Time-independent non-degenerate perturbation theory and its simple applications, Identical particles, symmetric and anti-symmetric wave function.

Crystalline state of solids, unit cell, bravais lattice, reciprocal lattice, interatomic forces, vibrations of monoatomic and diatomic chains, phonons.

Free electron theory of metals, electrons in periodic potential, Bloch waves, semiconductors, p-n, junction, diode, rectification, ripple factor, Transistor action and

characteristics, C.E. amplifiers and its frequency response. Logic gates, Boolean algebra, Combination logic, Integrated Circuits. Solar Cell, Amplitude modulation.

**Laser:** Stimulated and spontaneous emission. Einstein's coefficients, relative contribution of stimulated and spontaneous emissions, population inversion, Laser emission, characteristic of Laser light (including temporal), Amplification in an inverted medium, threshold condition for lasing.

**Holography:** Basic principles of Holography, Recording and Viewing of a hologram. Thick Hologram, Multiplex hologram, White light reflection holograms.

**Optical Instruments:** Introduction of multiple beam interferometry, Fabry-perot interferometer and etalon (resolving power and determination of wavelengths), Resolving power of Lumer Gehreck plate, Grating and prism spectrograph for visible, IR and UV regions.

**Atomic Physics:** Bohr-Sommerfield Model (Historical developments), Bohr model and the spectra of hydrogenic atoms, Critical resonance and the Ionisation potentials. Frank-Hertz experiment. Characteristic and continuous X-rays, Moseley's law, Bragg's law.

Space Quantization, Vector atom model and Quantum Numbers, Magnetic moment of the electrons and magneton, Larmor Precession, Electron Spin, Stem-Gerlach experiment, Qualitative concept of various quantum number of an electron, Pauli's exclusion principle anelectronic configuration of atoms.

**Magnetic Properties of Materials :**

Diamagnetism, Larmor's theory and diamagnetic susceptibility. Paramagnetism, Langevin's theory and Curie-Weiss Law, Qualitative discussion of Ferromagnetism and antiferromagnetism.

**Quantum Concepts:**

Particle nature of radiation, Photoelectric effect and Compton effect. Wave nature of particles. De-Broglie Waves, Davisson-Germer experiment, Wave Packets, Phase velocity and group velocity, Heisenberg's Uncertainty Principle and applications, One dimensional Schrodinger's Wave Equation and concept of probabilities, amplitude, application to onedimensional potential step and barrier. Quantum Mechanical Tunneling.

**Nuclear Physics:**

Natural radioactivity, Laws of radioactive disintegration, radioactive series, Detection of radiation, GM Counter and Bubble Chamber, Scintillation Counter.

Kinematics of nuclear reactions, artificial nuclear transmutation, discovery of neutron, radioactive tracers, transuranic elements. Cyclotron Constitution of nucleus, Binding energy, liquid drop model and the semiempirical mass formula, Elementary theory of • -decay, • - decay and discovery of neutrino Magic numbers and the shell model, exchange forces in nuclei and Yukawa theory (qualitative), Fission and fusion, Nuclear reactors (qualitative), Thermonuclear energy. Classification of Elementary Particles, Leptons, mesons and bayrons and their quantum numbers, Conservation Laws.

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# ZOOLOGY (19)

Nonchordates, Taxonomy and Evolution, Physiology and Biochemistry, Protochordates and Vertebrates.

Special Topics

Sphenodon as living fossil, Biting mechanism of poisonous snake; snake venom and antivenin. Flight adaptations of birds, Aquatic mammals.

Animal Distribution and Ecology, Genetics and Cell Biology, Molecular Biology and Genetic Engineering, Economic Zoology and Environmental Biology, Development Biology and Ethology.

# ANTHROPOLOGY (20)

## GENERAL ANTHROPOLOGY

**Meaning and Scope of Anthropology:** Branch of Anthropology, a) Social-Culture Anthropology, b) Physical/Biological Anthropology, c) Archaeological Anthropology, d) Linguistic Anthropology.

**Relations of Anthropology with other disciplines:** Life Sciences, Earth Sciences, Medical Sciences; Social Sciences and Humanities.

**The Basic terms and Concepts in Anthropology:** Culture, Society, Association, Institution, Culture change, Socialization, Mutation, Paleoanthropology, Geological time Scale, Glaciations and Pluviations, Pleistocene.

## SOCIAL-CULTURE ANTHROPOLOGY

Definition and types of Marriage, Family, Kinship: Economic and Political Anthropology: Meaning and Scope. Religion and Magic: Definition and Meaning. The Basic of Indian Social System Indian Village

**Major Concepts in Indian Anthropology:** Dominant Caste, Sanskritisation, Westernization, Sacred Complex, Nature-Man-Spirit complex, Little and Great Tradition, tribe-caste continuum. Special Constitutional Provisions, Problems and welfare measures related to tribes.

**Theories of Social-Cultural anthropology :** Evolutionism, Diffusionism, Functionalism, Culture and Personality, Contributions of the following Anthropologists:

a) Robert Redfield,

b). Durkheim, c) L.P. Vidhyarthi, d) M.N. Srinivas. Fieldwork Tradition in Anthropology

**Major tools of Research :** Observation, Interview, Case Study, Life History, Survey Research, Schedule and Questionnaire, geological Method.

## PHYSICAL ANTHROPOLOGY

**Theory of Organic Evolution:** Lamarckism, Neo-Lamarckism, Darwinism, Neo- Darwinism, Synthetic theory of Evolution.

**Position of man in animal kingdom:** distribution, classification and physical characters of Primate

**Comparative Anatomy of Man and Ape Fossil evidences of emergence of man:**

(a) Dryopithecine complex
(b) Australopithecine complex
(c) Pithecanthropus, Sinanthropus
(d) Neanderthal, Cro Magnon

**Concept of Race :** Criteria of Racial classification, Genetic basis of race, Racial classification of Indian **Population** (Guha's Classification).

**Human Genetics :** Basic Concept of Genetics, Mendelian Principles with reference to human. **Bio-Statistics-** Measures of Central Tendency: Mean, Median, Mode, and Standard Deviation.

**ARCHAEOLOGICAL ANTHROPOLOGY**

**Concept:** History, Pre-History, and Proto-history.

**Methods of Dating : Relative and Absolute methods.**

**Tool making techniques and tool topology.**

**Paleolithic, Mesolithic and Neolithic Culture of Europe.**

**Indus Valley Civilization: Main features, Town planning, economy, Polity, religion, Art & Craft, and** Causes of Decline.

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# DEFENCE & STRATEGIC STUDIES (21)

Art of Warfare in Indian, Contemporary Study of War and Peace, Indian Military History, World Military History, Strategic Thought, National Security, Science, Technology and National Security, Current Development related to India's Defence and Security.

# MATHEMATICS (22)

**Geometry:** Straight lines and planes, Spheres, Cones and cylinders, Central conicoids, Generating lines, Conics in polar coordinates.

**Algebra:** Sets, Relations and Maps, Groups, Cyclic groups, Normal subgroups and quotient groups, Lagarange's theorem, Symmetric and alternating groups, isomorphism theorems, Rings, Integral domains and Fields, Ideals and quotient rings, Polynomial rings, Linear and quadratic congruences, Legendre symbol, Arithmetic functions.

**Analysis:** Real number system, convergence of sequences and infinite series of real numbers, absolute and conditional convergence, Limits, continuity and differentiability of functions of one real variable, Mean value theorems and their applications, Riemann integrals, Convergence of improper integrals.

Limit, continuity, Partial and directional derivatives, Differentiability of functions of several real variables, Mean value theorems and Taylor's theorem for functions of several real variables, Jacobians, Inverse and Implicit function theorem, Convergence and uniform convergence of sequences and series of functions, Basic concepts in metric spaces, compactness in metric spaces, complex analytic functions.

**Differential Equations:** Differential Equations of first order and their applications, Equations of higher degree, Singular solutions, Linear differential equations of higher order, Variation of parameters, Linear systems of first order, Existence and uniqueness theorems for solutions of differential equations.

**Vector Calculus:** Scalar and Vector fields, Gradient, Divergence and Curl, Line integrals, Double integrals, Surface integrals and Volume integrals, Gauss', Stokes' and Green's theorems and their applications.

**Linear Algebra:** Vector spaces, Subspaces, Linear independence, Linear span, Bases and Dimension. Linear transformations and Matrices, Rank-Nullity Theorem, Systems of Linear Equations, Gauss elimination, Normal and Echelon form of a matrix, Determinant, Cramer's Rule, Eigenvalues and eigenvectors, Cayley-Hamilton Theorem, Diagonalization, Inner product spaces, Bilinear and quadratic Forms.

**Mechanics:** Virtural work, Catenary, Simple harmonic motion, Motion in a plane, Constrained Motion, Central orbits, Forces in three dimensions, Moments and products of inertia of rigid bodies, D'Alembert's principle.

**Hydrodynamics:** Kinematics of fluid motion, velocity potential, stream lines, Euler's equation of Motion, Fluid Motion in two dimensions: Complex potential, Sources, Sinks and Doublets and their image system with regard to a line and a circle.

**Numerical Methods:** Numerical techniques for roots of general equations, Interpolation, Numerical differentiation and integration, Numerical solution of first and second order ordinary differential equations, Matrix factorization and iterative methods for systems for linear equations, Estimation of eigenvalues and eigenvectors, Least square curve fitting.

# GEOGRAPHY (23)

**Lithosphere:** Origin of the earth, Geological history of earth; Interior of the earth; Rocks; Endogenetic and Exogenetic Forces, Volcanic and Earthquakes; Drainage pattern; Origin of Continents, Mountain Building, Plate Tectonic Theory, cycle of erosion & Interruption; Mass movement of rock wastes; Landforms formed by running water, wind, coastal, glacier and peri-glacier.

**Atmosphere:** Structure and composition of the atmosphere; Insolation; Pressure belts and winds; Local winds; Origin of Monsoons; Humidity and rainfall; EI Nino phenomena-Jet Stream, Tropical and temperate cyclones, Koeppen & Thonthwaite classification of world climates; Major climatics.

**Hydrosphere:** Continental shelf, continental slope, deep sea plains and ocean deeps; Bottom relief of Atlantic and Indian Oceans; salinity; tides; ocean currents; coral reefs. **Human Geography :** Nature, Scope, Development, Branches and Approaches of human geography; Man and Environment Relationship - Determinism, Neo-determinism, Possibilism, Neo-determinism & Human ecology of Mountains & Deserts and Probalism; Approaches - ecological, spatial, behavioural and welfare; Human adaptation, Races & Tribes; Types of farming; agricultural regions of the world; Production & distribution iron ore, coal, petroleum, Hydroelectricity, Iron and steel, Cotton textile and Chemical, fishing industry, Social groups and organization; Diffusion of Cultures; Cultural hearths; Major cultural realms,

**Population Geography :** Population - growth and demographic transition, distribution and density pattern; Structure and Composition of population; Migration of population in India World; Population policy in India. Over population, under population; optimum population; population -- resource regions; population problems in India; population planning and control

**Settlement Geography:** Rural settlements - types and patterns, size, spacing and morphology; distribution of rural settlements in Ganga plain; Urban settlements -- types and patterns, size, spacing and morphology; Classification of towns. Central place theory, Trends of urbanization in the world and in India; Problems of urbanization in India; Urban policy in India.

**Regional Geography of India:** Structure, relief and drainage; climate, origin of monsoon, droughts and floods, climatic classification by Koppen and Thornthwaite; soil types and distribution; Major minerals (iron ore, mica, Copper, manganese, bauxite and atomic minerals) - distribution, production and utilization; distribution and production of coal, mineral oil and hydel power; irrigation, agricultural regions, green and white revolution and agro-climatic regions. Industrial localization with reference to iron and steel, cotton textile, sugar, cement and chemical, and paper industries, Industrial regions; foreign trade.

**Regional Geography of World:** Concept of regions in geography; Types and Classification of regions, Criteria of delimitation and characteristics of natural, cultural, economic and political regions. **Asia** Structure; relief; drainage; climate; natural vegetation and soils; spatial distribution of population; economic base; Regional studies of south, south -east, east and west Asia. **Europe:** Physical, economic and demographic characteristics; Regional studies of British Isles, Eastern, Western and Mediterranean realm. **North /South America and Australia:** Physical, economic and demographic set up; Regional studies of USA, Canada, Brazil and Australia.

**History of Geographical Thought:** Meaning and scope of geography; Changing philosophy, Approaches to the study of geography Contributions of Greek, Roman, Indian, Chinese, Arabs, Period of Dark Ages & Renaissance, Contributions of German, French, British, American and Russian, Dichotomies in geography, Fundamental concepts in physical, human, economic and settlement geography.

**Practical:** Statistical Techniques - Mean, Median Mode, Mean & Standard Deviation, CV, Correlation, Regression, Chai-square & Students' test, nearest neighbor, quadrate count, mean centre, standard distance, drainage & transport network. Projection: Conical Two standard, Bonnes', Polyconic, Cylindrical - Mercator & Equal Area, Zenithal - Equidistant Polar & Stereographic.Mapping - Choropleth, Isopleth, Proportional Circle, Dot method. Graphical Representation: Hythergraph, Climograph, Histogram Scatter graph, Bar graph. Surveying: Plane Table, Prismatic, Indian Clinometer & Telescopic Alidade.

# PSYCHOLOGY (24)

Section I : PSYCHOLOGY PROCESS

Section II HOLOGICAL STATISTICS

Section III HOPATHOLOGY

Section IV PSYCHOLOGY AND SOCIAL PROCESSES

Section V LOPMENT PSYCHOLOGY

Section VI RSONALITY RESEARCH AND MEASUREMENT

Section VII A INICAL PSYCHOLOGY IN SCHOOL SETTING

**OR**

**SECTION VII B :** ORGANISATIONAL BEHAVIOUR

# STATISTICS (25)

**Probability Theory:** Random experiments, Sample space, events, algebra of events, axiomatic definition of probability, probability spaces, relationship of axiomatic and classical probability, role of frequency ratios, properties of probability measure, subadditivity, Boole's inequality, probability of union of events, matching problem, repeated birthday problem, occupancy problem, statistics of physical particles, conditional probability and associated probability space, Bayes theorem, independence of events.

Random variables as functions, induced probability measure via inverse mapplt1g, induced probability distribution, distribution functions, distribution functions and their properties, probability mass function (pmf) of discrete random variables, probability density function (pdf) of continuous random variables,

Random vector, marginal and conditional distributions, independence of random variables

Mathematical expectation, moments, factorial moments, moment generating function, probability generating function, Expectation of jointly distributed random variables, marginal and conditional expectation, correlation, Chebyshev's inequality, Markov's inequality, functions of random , variables.

Bernoulli distribution, binomial distribution, Poisson distribution, derivation of Poisson distribution as a limiting case of binomial distribution, geometric distribution, negative binomial distribution, hypergeometric distribution, multinomial distribution, uniform distribution, normal distribution and its relationship with the binomial and Poisson distribution, Cauchy distribution, bivariate normal distribution and its marginal and conditional distributions.

**Statistical Methods:** Measures of central tendency, dispersion, moments, skewness and kurtosis. Simple linear regression, method of least squares, correlation coefficient,' correlation ratio, intraclass correlation, rank correlation, fitting of some nonlinear curves. Multiple regression, multiple and partial correlation for three variables. Analysis of Categorical Data, consistency, independence and association of attributes, coefficient of contigency.

**Statistical Inference:** Random sample from a given pdf or pmf, Functions of random , variables and their distributions Sufficiency, factorization theorem, consistency, Unbiasedness, Estimation method of maximum likelihood, method of moments. Statistical Tests of Hypothesis-Fundamental concepts including the power function, p values, Neyman and Pearson Lemma, most powerful (MP) and uniformly most powerful (UMP) tests, Applications of X 2, t, F and z distributions in tests of significance, Likelihood ratio test, Unbiased test, Neyman Pearson Lemma for randomized tests, Randomized test for binomial and Poisson distributions. Completeness and sufficiency, Rao-Blackwell theorem, Lehman Scheffe theorem, one parameter exponential family and its completeness, Cramer- Rao inequality, Best linear unbiased estimator.

**Sampling Theory:** Simple random sampling and Stratified sampling, Sample surveys versus complete enumeration, Non sampling errors, Simple random sampling \vith and without

replacement, simple random sampling for attributes, Stratified random sampling, advantages of stratification, methods of allocation. Use of auxiliary information: Ratio, regression and product method of estimation, Systematic sampling, Cluster sampling with equal clusters.

**Vital Statistics:** Crude, death rates, infant mortality rates, standardized death rate, complete and abridge life table - construction and uses, mortality rate and probability of dying, use of survival tables. Measurement of fertility - crude birth rate, general fertility rate, total fertility rate, gross reproduction rate, net reproduction rate, population growth and logistic model for population projection.

**Design of Experiments :** One-way ANOVA, two-way ANOVA with single observation per cell and equal number of observations per cell. Randomization, Replication, Local Control,

Completely randomized design CRD), Randomized block design (RBD) , Latin square design (LSD), 22 and 23 factorial experiments.

**Nonparametric Statistics :** Order statistics, Distribution of maximum, minimum and r-th order statistic, Joint distribution of r-th and s-th order statistic, distribution of range, distribution free confidence intervals for quantiles and distribution free tolerance intervals, Sign test, Wilcoxon test, Median test, Run test.

**Index number:** Price relatives and quantity or volume relatives. Link and chain relatives, computation of index numbers, Laspeyre's, Paasche's, Marshal - Edgeworth's and Fisher's index numbers, chain base index number, consumer price-index numbers. Tests for index-numbers: Time and Factor reversal tests.

**Time Series:** Components of time series, additive and multiplicative models, methods of determination of trend, growth curves, analysis of seasonal component and seasonal indices.

**Statistical Quality Control :** Causes of variation in quality, control limits, charts for attributes, np chart, p-chart, c-chart, Charts for variables- X- and R charts.

# M.Com. (MASTER OF COMMERCE) (26)

Statistics, Business Organisation and Management, Income Tax, Cost Accounting, Financial Accounting, Business Law, Company law, Business Finance, Computer & Business Communication, Auditing, Goods and Service Tax (GST), Marketing, Human Resource Management, Insurance, Banking, Business environment and Economics.

# MASTER OF PHYSICAL EDUCATION (M.P.Ed.) (31)

**1. Introduction, Foundation and Management of Physical Education**

1.1 Aims and objectives of Education and Physical Education and Contribution of Physical Education.

1.2 Biological, Psychological and Sociological Principles and their Application in Physical Education.

1.3 Different Schools of Philosophy and their relevance to Physical Education.

1.4 Meaning, Phases, Nature and Importance of Management.

1.5 Location, Preparation, Layout and Maintenance of Play Fields Construction, care and Maintenance of Gymnasium and Swimming Pool.

1.6 Equipments in Physical Education Criteria of selection, procedure of purchase, care and maintenance of equipments.

1.7 Intramural and Extramural Programmes.

1.8 Budget for Physical Education- Budget making and accounting.

**2. Health Education**

2.1 Definition of Health and Description of its components.

2.2 Definition, Scope and Principles of Health Education.

2.3 Health Problems in India.

2.4 School Health Programme

2.5 Nutrition, Assessment of Nutrition, Classification of Food, Balance Diet.

**3. Anatomy, Physiology and Physiology of Exercise** 3.1 Essential properties of Living Matter.
3.2 Cell, Tissues, Organs and Systems- Structure and Function

3.3 Study of following systems and processes with a view to understand the effect of exercise on Different systems of the Body.

3.3.1 Cardio- Vascular System

3.3.2 Respiratory System

3.3.3 Nervous System

3.3.4 Metabolism and Temperature Regulation

3.3.5 Sensory System

4. **Educational Methods and Educational Technology** 4.1 Teaching Technique in Education
4.2 Principles of Teaching, Commands and Class Management

4.3 Lesson Planning- Physical Education and Coaching Lessons

4.4 Tournaments- Knockout, League, Combination and Challenge types.

4.5 Audio- Visual aids- values, criteria for selection and suggestion for use.

4.6 Presentation Techniques in Physical Education.

4.7 Micro Teaching, Simulation Teaching.

4.8 Definition of Components of an Instruction System, Advantages of System approach.

5. **Educational Psychology**
5.1 Growth and Development, types of learning, principles of learning, Learning use.

5.2 Factors of learning and theories of learning.

5.3 Individual Differences

5.4 Personality (Meaning & Memory)

5.5 Memory & Types of Memory.

6. **Kinesiology and Corrective Physical Education** 6.1 Types of Joints & Muscles.
6.2 Major Terminologies of Fundamental Movements.

6.3 Location and Action of Major Muscles.

6.4 Motor Unit and all & Non- Law.

6.5 Reciprocal Innervation.

6.6 Equilibrium and Friction.

6.7 Prevention of Injuries.

6.8 Massage

6.9 Postural Deformities

6.10 Therapeutic Exercises

6.11 Rehabilitation of Sport Injuries.

7. **Test & Measurements**
7.1 Test, Measurements, Evaluation, Statistics, Their Meaning

7.2 Measures of Central Tendency, Measures of Variability.

7.3 Percentile and correlation

7.4 Criteria of Test Selection

7.5 Motor Fitness tests, Skill Tests of different Games & Sports

**8. Sports Training**

8.1 Meaning, Definition and Principles of Sports Training

8.2 Definitions, types and factors of training load.

8.3 Meaning and Classification of speed, strength and endurance.

8.4 Training method of speed, strength and endurance.

8.5 Definition and method of teaching training.

8.6 Meaning, types & importance of periodization.

9. General Knowledge/ Awareness with special reference to Major Games/Sports (AIU/ IOC listed); Reasoning etc.

# MASS COMMUNICATION (32)

1. General awareness including constitutional matters, current affairs, public debates on matter of polity, economy, science & technology. Awareness of International Development and their impact of Indian society.

2. Exposure to issue and debates covered by print media, television news channels and radio. General understanding of Indian Art, Culture, National movements and Cinema.

# M.A. THEATRE & FILM (33)

No prescribed syllabus. Questions are based on general awareness about film and theatre.

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# BIOCHEMISTRY (34)

**General Chemistry:** Properties of s, p, d, f block elements. Activity series. Acids, bases and buffers. Osmotic pressure. Thermodynamics. Colloidal state and membrane phenomenon. Solutions. Mechanisms of organic reactions. Properties of aliphatic and aromatic compounds. Stereochemistry. Concept of free radicals.

**Bio-physical techniques:** Basic Principles of Chromatography, electrophoresis, spectroscopy and their applications.

**The Living system:** Origin of life, Cell and cell organelles, General introduction to microbial and plant world, chordates and non-chordates. Environmental biology.

**Biomolecules:** Classification, Structure, and functions of Carbohydrates, Proteins, Lipids, Nucleic acids and Vitamins. Fundamental concepts of nutrition.

**Enzymes:** Classification, properties, kinetics and regulation of enzymes. Allosteric enzymes, isozymes and immobilization.

**Genetics and Molecular Biology:** Laws of inheritance, linkage, crossing over and chromosome mapping, Mutation, Cell cycle, Cell division. DNA as genetic material,

replication, transcription, translation and gene regulation. Genetic engineering. Use of virus and bacteria in gene cloning.

**Metabolism and Clinical Biochemistry:** Glycolysis, Krebs cycle, oxidative phosphorylation, gluconeogenesis, p-oxidation, transamination, urea cycle, in-bom errors and regulation of metabolism. Diagnostics markers of diabetes, lipid disorders, liver and kidney function. !

**Human Physiology:** Digestion, respiration, blood and immune system, excretion, reproductively physiology, muscle contraction, nerve transmission. Acid-base balance. Hormones.

**Plant physiology:** Photosynthesis, photorespiration, nitrogen fixation, senescence, plant harmones.

# AGRICULTURAL BOTANY(35)

Historical, symptomology, properties and nature of plant viruses, modes of transmission of plant viruses. General principle of control of viral diseases in plants. A knowledge of the common viral diseases of potato tobacco, Hibiscus, cucurbits, beans and banana. Historical, broad outlines of morphology, reproduction, nomenclature and classification of plant pathogenic bacteria. History of Mycology, Taxonomy and nomenclature of fungi. Origin and phylogeny of fungi. Different, systems of classification and their basis. Structure and life history of the chief representatives of fungi. History of plant pathology. Dissemination of diseases, modes of infection symptomology, physiology of parasitism, mechanism of disease resistance, fungicides and their action.

Cell structure and function, cell wall, nucleus, mitochondria, golgi apparatus, chloroplasts and other cell organelles, their structure and function. Cell division : mitosis and meiosis. Polyploidy: Nature and classification of Polyploidy. Heridity and environment, laws of heredity; Linkage, crossing over and mapping of chromosomes. The nature of gene and factors affecting mutation. History of plant breeding, its present status and scope. Mode of reproduction in crop plants. Heterosis and its application.

Regional soils of India in relation to crops and their production. Secondary effects on micro flora. Physical nature of soils and water relation of soils. Concept of water requirement of crops and the critical period of water requirement of plants and its significance in crop production.

Formation of usar soils and their measurement. Control of alkalinity and salinity. Physiology of flowering, photoperiodism, verbalization and their impact on crop production. Seed formation, longevity and multiplication. Physiology and biochemistry of herbicides. Physiology of propagation. Physiology of fertilization, fruit growth and ripening. Mineral nutrition, uptake and translocation of solutes. Mutually beneficial and toxic influences of plants. Physiological role of some major and minor elements such as N, R K, Ca, Mg, B, Mo, Mn, Zn.

A study of the botany of important weeds associated with the crop plants of U.P Methods of preventing introduction and spread of weeds. Principles and procedures of weed control Growth, inhibiting, and promoting chemicals and their composition. Soil microorganisms and their role in production. Principles, and practices of dry farming, special problems in dry farming mixed cropping and strip cropping in agriculture in India. Agronomic practices in relation to soil acidity and alkalnity.

Soil nitrogen losses and its restoration, Phosphorous deficiency and soil fertility. Fixation of nutrients in soil. Soil potassium in relation to soil fertility and plants growth and development. Plant production problems and methods. C/N ratio as a function of growth and development. The problems of non-irrigated soils. Tillage and its influence on plant growth. Horticulture- importance and present position. Origin, history, breeding and production technology of important fruits such as Mango, Banana. Citrus, Guava. Papaya, Grape. Pineapple, Litchi, Pomegranate, Ber, Apple, Pear and Walnut with special reference

to climate, soil, propagation, cultivars, nutrition, irrigation and other orchard management practices. History of gardening of India. Styles of gardening, their principles and practices with special reference to Mughal, Japanese and English gardens. Frequency distribution, mean, median and mode. Standard deviation. Test of significance : t, F and chi-square tests. Experimental design basic principles, completely randomized. Randomized block, Latin square and Split-plot designs and their analysis.

# AGRICULTURAL CHEMISTRY AND SOIL SCIENCE(36)

Theory of acid and bases, pH and its determination, buffers, oxidation, reduction, catalytic reaction, colloids & their properties, Humus and clays.

Carbohydrates nomenclature, classification, proteins-classification, physical & chemical properties. Liquids classification and properties.

Soil texture & structure. Soil moisture & its movement. Soil chemistry : weathering of rocks & minerals, profile development. Soil forming processes, exchangeable properties of soil, organic matter-properties and its fractions. Reclamation of Soils. Quality of irrigation water. Soil fertility-macro & micro nutrients.

Manures & fertilizers-classification, mode of action & utilization. Uptake of nutrients.

Pesticides & residual toxicity.

Enzymes classification & their mechanism of action.

Metabolism of carbohydrates, lipids & proteins.

N-fixation, Phytohormones & vitamins.

# AGRICULTURAL ZOOLOGY & ENTOMOLOGY(37)

1. General introduction to animal kingdom and various phyla with special reference to agricultural and economic importance. Agricultural importance of phytonematodes. snails, slugs, earthworms, crabs, birds, and mammals, their distribution, habit and life cycle.
2. Identification of poisonous snakes of India. Symptoms of snake bite and its antidotes. Life history and control of animal vectors of human diseases and important parasites of man animals.
3. Local fishes of ecdnomic importance, planning and implementation of fish farming, knowledge of crustacean and molluscan fisheries. Rat damage to crops and plantations. Methods of its control.
4. Classification of Phylum Arthropoda upto classes: general characters and examples. Position of insects in animal kingdom. Study of characters of insect orders of economic importance. Life history, rearing methods of some useful insects viz. honeybee, silk worm and lac insects.
5. Insect morphology integument and its structure, regions, sclerites. segmentation of head : Its appendages, structure and function : modification of antennae and mouth parts of insects. Study of insect thorax and its appendages including genitalia.
6. Anatomy of grasshopper, digestive, respiratory, excretory, circulatory, reproductive, nervous system and sense organs. Post embryonic development of insect, ecdysis, instars. metamorphosis, types of larvae and pupae. Pest management: principle of integrated Pest management, concept, and procedure. Physical, mechanical, chemical, biological, and legislative control of insects. Insecticide poisoning and its antidotes. Concept and importance of wild life conservation in relation to ecology and environment.

# MATERIALS SCIENCE (38)

**Eligibility :** Candidate should be B. Sc. With Physics or Chemistry as one subject in III year.

Provided he/she has Mathematics as one subject at least upto II year.

Mathematical Functions, Simple Integration & Differentiation, Differential equations, Curve of simple functions, Scalar and Vector products. Vector Differentiation, Gradient, Divergence and Curl. Vector integration. Theorems of Gauss. Stoke's and problems based on these.

Thermodynamics, Kinetic Theory, of Gases, Conduction of Heat and Radiation.

Motion under central forces, Mechanics of nonrigid bodies, Elastic properties, Fluid Mechanics.

Electrical Circuits: AC, DC and transient behavior.

Semiconductor Electronics including photonics and digital electronics. One dimensional motion in non dispersive media, Ultrasonics.

Electrostatics in free space and in dielectric media, Electric Current, Magnetostatics, Time varying fields, Electromagnetic waves in free waves, Physical optics.

Atomic Physics, X-ray, Vibration and Rotational spectroscopies, UV-visible spectroscopies, NMR

Need of quantum mechanics, observables and operators, Schrodinger equation and its simple applications upto hydrogen like atoms.

Crystal Structure, Reciprocal Lattice, Interatomic forces and classification of solids, Free electron theory and band gap of solids, Electrical and Magnetic properties of Materials.

Chemical Bonding, Valence bond theory, Molecular orbital theory.

Properties of s and p blocks. Transition and inner transition elements. Coordination compounds, Complex Formation.

Fundamentals of Organic Chemistry, Stereo Chemistry of Carbon Compounds, Isomerism, reaction mechanisms, Chemistry of Fundamental groups.

Chemical Kinetics : Zero, First, Second and Third order reactions, Chemical Equilibria.

Electrochemistry, reversible electrodes, Electrode reactions, Nernst Equation, Determination of Cell E.M.F., Concentration Cells, Acid-Base Concepts.

Photochemistry : Lambert-Beer law, Jablonski Diagram.

# BIOINFORMATICS (39)

**Eligibility Criterion:**

The Course for M.Sc. in Bioinformatics will be open those student who have passed the B.Sc. Examination of this University or any other University recognized by this University with the following combinations with 55% of the marks.

(a) Zoology, Botany, Chemistry

(b) Zoology, Chemistry, Biochemistry

(c) Botany, Chemistry, Biochemistry

(d) Mathematics, Physics, Chemistry

(e) Mathematics, Physics, Computer Science

(f) Mathematics, Physics, Statistics

Those who have passed B.Sc. with Molecular Biology, Cell Biology, Microbiology, Biotechnology, Biophysics, Biochemistry, Structural Biology, as one of the subjects can also apply.

**Syllabus for Admission Test:** The syllabus for the admission test will be of graduation level for above mentioned subjects/combinations.

# M.Sc. IN ENVIRONMENTAL SCIENCES (40)

**Earth Sciences:** Structure and composition of Environment- Atmosphere, Hydrosphere and Lithosphere, Earth Processes, Hydrological cycle and Global water balance, Types of Rocks and Weathering of Rocks, Soil formation and Soil profile, Soil erosion & Conservation of soil, Mineral and Power Resources in India, Biogeochemical Cycles, Metrology, Natural Disasters, Major man-induced disaster: Bhopal and Chernobyl Disaster.

**Physical and Chemical Sciences:** Mechanics, Gravitational force, Thermodynamics, Quantum physics, Electrostatics, Nuclear physics, Optics, Electromagnetic waves, Sound.

Inorganic chemistry- Atomic structure, Periodic table, s, p, d and f block elements, Chemical bond, Chemical Kinetics, Acids and Bases, Oxidation and Reduction, Coordination chemistry. Organic chemistry-isomerism, Nomenclature, Name reactions, Mechanism of organic reactions, Hybridization, Chemical bonding, Aromatic compounds. Buffering capacity, Essential and trace elements in living systems. Toxicity of Heavy metals

**Biological sciences:** Plant and Animal kingdom-classification, Characteristics of various groups, Morphology, Anatomy, Adaptations, Cell biology, Molecular biology, Structure and functions of biomolecules, Genetics, Microbiology, Biotechnology, Photosynthesis, Respiration, Nitrogen metabolism, Protein synthesis, Growth hormones, Enzymes, Structural and functional aspects of Digestive, Respiratory, Circulatory, Muscular, Excretory, Reproductive, Endocrine and Nervous system of animals, Economic botany and Plant diseases

**Ecology and Environment** Biosphere, Organizational levels of biosphere, Ecosystem: Structure and Types, Food Chain and Energy Flow, Population and Community Ecology, Biodiversity and its Conservation.

**Mathematics and Statistics-** Matrix, logarithms, Differential and Integral Calculus, Trigonometry, Sequence and Series, Probability. Mean, Mode and Median, Standard deviation, Correlation, Regression.

**Environmental Studies:** Natural resources- Water, Soil, Food, Energy, Forests, Minerals, Environmental Pollution, Global environmental problems, Social issues related to environment.

# TEXTILE AND APPAREL DESIGN (41)

**Design-** Types of Design, Principles of Design, Element of Design-Line texture, Colour.

**Fashion-** Fashion cycle, theories of fashion.

**Teaching in pattern making-** Drafting, draping, pattern.

F**itting-** Associated problems

**History** & scope of Apparel Design in India.

**Terminology of fabric cutting & sewing**

**Drafting's of** - frock, Romper, Women's garments, Men's garments.

**Properties of textile fibers.**

**Textile chemistry-** Natural fibers, man made fibers, yarn construction, Fabric finishes, Dyes types.

**Traditional textile of India** - Chikankari, Zardosi, Kanthas of Bengal, Kashmiri kasheeda, Muslins of Dhaka, Amru and Himru of Hydrabad, Baluchari, kanchi varams, chanderi's , phulkari, patola.

**Removal of stain** - Cotton, Silk, and synthetic fabric soap manufacturing.

**Laundery & dry cleaning** - Soap making, types of bleeches.

**Printing methods-** Resist, block, and Screen printing.

# M. Sc. Design and Innovation in Rural Technology (42)

**Unit-1**

A general introduction to Fungi including importance and reproduction Bacteria, Plant viruses: Introduction and their economic importance. An elementary knowledge of soil, water, sewage, milk, food and air bacteria. Introduction of industrial microbiology. Algae: a general introduction with their importance.

**Unit-II**

A brief account of Bentham & Hooker system of classification, General introduction of following families with their economic importance:

Poaceae, Leguminosae, Orchidaceae, Brassicaceae, Moraceae, Cucurbitaceae, Asteraceae, Solanaceae, Rubiaceae, Apiaceae, Lilliaceae etc.

Different types of fruit with reference to their marketing. Broad outline of morphology & anatomy of vegetative and reproductive organs of angiosperms, cell wall structure, tissue and tissue systems.

Growth and growth hormones, Photosynthesis and Respiration, Nitrogen assimilation and fixation. Climate, weather and different plant communities including hydrophytes, mesophytes, xerophytes, mangroves, epiphytes and parasites

**Unit-III**

Concept and scope of genetic engineering, role of enzymes. GM crops and their importance Different plant diseases and their management. Integrated paste management (IPM), major human diseases caused by bacteria and fungi. Tissue culture and their applications. A general introduction of horticulture, floriculture, apiculture and sericulture.

An introduction to Bee-keeping, pearl culture and tasar culture.

**Unit-IV**

Different models of rural development, Sustainable development, Different schemes of central government. Agriculture and economic development, Agro-forestry.

Concept of society, Adult & Non-formal Education, Sanitation programme and implementation, Government Health insurance schemes, bank insurance, smart card for BPL families.

Kharif, Rabi and Zaid Crops. Factors affecting the cultivation and production of crops.

**Unit-V**

Civil Society and NGO Management, NGOs as Society, NGOs as non-profit company, NGOs as Trust.

Entrepreneurship, Movement in India, role of entrepreneurship in economic development, need for rural entrepreneurship.

Computer hardware and software, operating system, GIS, Remote sensing.

Land resources: Land as a resource. Dry land, land use classification, and degradation.

Email : helpdesk.aupravesh2019@gmail.com
Helpdesk Number : Tolled No. : +91 9453827208
Tollfree No. : 18001805643

# M.Sc. (APPLIED GEOLOGY) (43)

(Candidate has to attempt any two papers from following 03 papers and merit will be based on sum of marks obtained in attempted 02 papers)

## MATHEMATICS

**Elementray Symbolic Logic :** Sets-Algebra, cartesian product, Relation, Functions, Injective and Surjective MAPS; Inverse Functions.

**Number System :** Natural numbers, Integers, Integer modulo-N division algorithm, Enclidean Algorithm, Prime factorization.

**Real-Number System :** Complex Numbers, Real Sequence, Convergence of Infinite Series, Limit and Continuity of Functions of one Variable, Properties of continuous function in closed intervals. Differentiability and its application.

**Differential Equations :** Differential equations of first order, Linear differential equations with constant coefficients.

**Functions of Several Variables :** Limits, Continuity, Partial Derivatives, Differentiability, Gradient, Divergence, Curl, Line Surface and Volume Integrals.

**Linear Algebra :** Vector Spaces, Bases and Dimensions, Rank of Linear Transformations, Matrices, Matrix Representation of Linear Maps, Determinants, Rank of Matrices, Eigenvalues, Eigenvector, Cayley-Hamilton theorem, Diagonalisation of Matrices with distinct eigen values. Sequences and series of functions of a real variable, uniform coveregence Richan-integral of a Bounded function, convergence of Improper Integrals.

**Statistics & Probability :** Basic concepts and Bayes theorem.

## PHYSICS

**Mechanics and Elementary Relativity theory :** Motion of systems of particles, Linear and angular momentum, Rotational Motion, Moment of inertia.

**Non-rigid bodies :** Stress and strain, Elastic moduli, Generalised Hook's law.

**Fluid Mechanics :** Ideal and viscous fluids, Equation of continuity, Rotational and Irrotational flows, Bernoulli's Theorem, Poiseuill's Equation, Stoke's Law.

**Special theory of Relativity :** Gallilean Transformation, Postulates of Special Theory, Lorentz transformation, Relativistic Dynamics.

**Thermal Physics :** Zeroeth law of Thermodynamics, Concept of temperature, First law of Thermodynamics, Simple Applications, Reversibe and Irreversible Processes, Second law of thermodynamics, Carnot's cycle, Entropy, Temperature Entropy Equation, Thermodynamic potentials, Joule-Thomson effect, Kinetic theory of gases, Conduction and Radiation of heat.

**Optics :** Corpuscular and Wave Theory of Light, Interference, Diffraction, Fresnel's Theory, Fruanhoffer's Diffraction, Resolving Power of Prism, Polarization, double Refraction, Production and Detection of elliptically and circularly polarized Light, Basic Ideas of stimulated Emission, Lasers.

**Wave-Motion, Electrostatics, Magneto statics :** Oscillations-Simple Harmonic and Damped Oscillations, Forced Oscillations, Wave Motion in Non-Dispersive media, Wave Equation, Progressive Wave Solution, Acoustic Impedance, Energy Density, reflection and Transmission of Plane Waves, Coulomb's Law, Gauss's Law, Electric Dipole, Dielectrics, Ampere's Law, Biot-Severt's Law, Vector potential, Divergence and Curl of B, Magnetic Material and Magnetization, Time Varying Fields, Displacement Current, Curl of H, Faraday's Law, Self and mutual inductance, Electromagnetic waves in free space, Maxwell's Equations.

**Atomic & Nuclear Physics :** Bohr-Sommerfield model, Characteristics of Continuous X-Rays, Space quantisation, Bohr Magneton, Larmor Precession, Diamagnetism, Paramagnetism, Ferromagnetism and Antiferromagnetism. Quantum Concept : Photoelectric effect, Compton effect, deBroglie waves, Heisenberg's uncertainty principle, One-Dimensional Schrodiner's wave equation. Nuclear Physics : Natural Radioactivity, Fission and fusion, Liquid Drop Model.

**Electrical Circuits and Basic Semiconductor Electronics :** Circuit parameters, Kirchhoffs laws, Norton's and Thevenin's theorems, Charging and discharging of condenser, Growth and decay of current in R-L circuits, Balance and sensitivity conditions for A-C bridge,

Semiconductor materials, Diodes and Transistor, Measuring instruments, multimeters and CRO, Digital Electronics.

## GEOLOGY

**The Planet Earth:** Origin of the solar system and the Earth; Geosphere and the composition of the earth; Shape and size of the earth; Earth -moon system; Formation of continents and oceans; Dating rocks and age of earth; Energy in the earth systems; Volcanism and volcanic landforms; Interior of earth; Earthquakes; Earth’s magnetism and gravity, Isostasy; Elements of Plate tectonics; Orogenic cycles.

**Geomorphology:** Weathering and erosion; transportation and deposition due to wind, ice, river, sea, and resulting landforms, Structurally controlled landforms.

**Structural Geology:** Concept of stratum; contour; Outcrop patterns; Maps and cross Sections; Dip and Strike; Classification and origin of folds, faults, joints, foliation and lineation, unconformities; Shear zones.

**Palaeontology:** Major steps in the evolution of life forms; Fossils; their modes of preservation and utility; Morphological characters, major evolutionary trends and ages of important groups of animals-Brachiopoda, Mollusca, Trilobita, Echidnodermata; Gondwana plant fossils; Elementary idea of vertebrate fossils in India.

**Stratigraphy:** Principles of stratigraphy; Litho-, chrono- and biostratigraphic classification; distribution and classification of the stratigraphic horizons of India from Achaean to Recent.

**Mineralogy:** Symmetry and forms in common crystals classes; Physical properties of minerals; Isomorphism and Polymorphism, Classification of minerals; Structure of silicates; Mineralogy of common rock-forming minerals; Modes of occurrence of minerals in rocks. Transmitted polarized light microscopy and optical properties of uniaxial and biaxial minerals.

**Petrology:** definition and classification of rocks; igneous rocks-forms of igneous bodies; Crystallization of magma; classification, association and genesis of igneous rocks; sedimentary rocks-classification, texture and structure; size and shape of sedimentary bodies. Metamorphic rocks-classification, facies, texture and properties.

**Economic Geology:** Properties of common economic minerals; General properties of formation of mineral deposits; physical character; Mode of occurrence and distribution in India both of metallic and non-metallic deposits; Coal and petroleum Occurrences in India.

**Applied Geology :** Ground water Hydrology; Mineral exploration, elements of Mining Geology and Environment Geology; Principles of Engineering Geology.

# M.Sc. Food and Nutrition (44)

## I. Physiology

1. Structure and organization of: Cells, Tissues, Muscular System, Cardio-vascular system, lymphatic system, Digestive system, Excretory system, Urinary system, Nervous system, Endocrine system, Reproductive system.

## II. Normal and Therapeutic Nutrition

1. Food Groups, Balanced Diet, recommended Dietary Allowances, Basal Metabolic Rate, Body Mass Index, Nutrients, Vitamins, Minerals, Water.
2. Life cycle Nutrition: Infancy, Pre-school, School going, Adolescence, Adulthood, Geriatric, Pregnancy and Lactation.
3. Nutritional/Dietary treatment during diseases: Protein Calorie Malnutrition, Deficiency diseases, Fevers, Overweight and underweight, Gastro-intestinal tract diseases, Diabetes, Liver and Gall bladder diseases, Kidney diseases, Cardiovascular diseases.

## III. Food Science

1. Types, Classification, Nutritive value and use of : Cereals, Pulses and Legumes, Vegetables and Fruits, Milk and milk products, Meat, Fish and Poultry, Eggs, Oil seeds
2. Concept and use of: Sprouting, Pasteurization, Food Preservation, Food Additives

## IV. Biochemistry

1. Structure and General properties of: Carbohydrates, Lipids, Proteins, Nucleic acids
2. Chemistry and Metabolic functions of: Vitamins, Minerals, Enzymes and Hormones
3. Metabolism of : Carbohydrates, Lipids, Proteins

## V. Food Microbiology

1. Classification of microbes, General study of prokaryotes, Yeast, Moulds and fungi
2. Distribution of micro-organisms in the air, Water, Soil, Milk, Fruits and vegetables etc.
3. Bacteria , Virus, protozoa and Fungi associated diseases
4. Food poisoning and food infection
5. Microorganisms in fermentation and decay

# Women's Studies (45)

Women's Studies is a multidisciplinary subject. Multiple choice questions will be set from all areas of Women's Studies including the History of Women's Studies in India as well as in the West as well as current advancements in Women's Studies. Important institutions related to Women's Studies and Women's Empowerment, International as well as Indian legislation related to Women eg: Prevention of Sati, Domestic Violence, Sexual Harassment, Triple Talaq etc., the role of MHRD and UGC in the development of Women's Studies. Questions will also be set on the Feminist Movement in India as well as in the West, the three waves of Western Feminism, various kinds of Feminism, Eco Feminism. The candidate must have a knowledge of issues and people related to Women's Empowerment and Welfare in India, the Women's Movement in India both before and after Independence, India National Policies and Agencies concerning Women's Development, eg. *Sva Shakti, Swayam Siddha,* STEP, NCW, Ministry of Women and Child Development etc. Questions will also be asked on the efforts made by the United Nations at the International level eg., CEDAW, International Women's Day, Women's Conferences from Mexico to Beijing. In addition to all this the candidate must have a knowledge of Women and Development, Gender and Development, Women and Literature, Women and Cinema, Women and Science, Women and Sports, LGBT, Women's Associations like WIA, NCWA, AIWC, important women from all fields at the international and National level, Feminist Research and Feminist Research Methodology.

# M. TECH. IN EARTH SYSTEM SCIENCE (ESS) (46)

Statistical Distributions, Probability, Curve fitting, Correlation, Regression, Mean, Variance, Analysis of variance, Significance tests, Fundamentals of computers and programming, Knowledge of different operating systems, Numerical Methods, Ordinary and Partial Differential Equations, Basics of Atmosphere and Ocean, Weather and Climate, Composition and structure of atmosphere, Thermodynamics of the atmosphere, Laws of thermodynamics, Heat budget, Properties of seawater, Temperature, Salinity, Density, Conductivity, Indian Monsoon, Ecological Principles, Molecules and their interaction relevant to Biology.

# MASTER IN DEVELOPMENT STUDIES (47)

The programme has a provision of the lateral entry after three years. Those students of the Centre's Integrated Programme who have obtained 6.0 CGPA in case of General and OBC category and 5.5 CGPA in case of SC and ST shall be automatically enrolled in the Master in Development Studies Programme. Remaining vacant seats shall be filled-in through the AU PGAT 2017.

Eligibility criteria for the remaining seats have been determined as follows: Minimum 50% marks or equivalent grade in High School and Higher Secondary/Intermediate and 55% or equivalent grade in Bachelor of Social Work / B.Com. / B.A. in Economics / B.Sc.(Ag.) / Bachelor in Development Studies/Globalization and Development Studies/Bachelor in Business Administration / Management / Bachelor degree in Rural Development/Bachelor of Planning from a recognized University and minimum 50% score in PGAT**.**

**Syllabus :**

A. Theories & perspective of development and globalization
B. International politics and relations
C. Global economic order
D. Corporate sector and Globalization
E. Globalization and tribal & rural societies
F. Science and Technology in Global era
G. Mass Media & Information & Communication Technology (ICT), Sustainable development and Environmental issues
H. Basic Computer Skills
I. Idioms & phrases
J. Foreign words

# MFA (MASTER OF FINE ARTS) (48)

**Theory : (conducted by the University)**

**Syllabus:** Aesthetics & Art Appreciation (Indian and Western)

History of Indian Art (Pre-history to Modern)

History of Western Art (Pre-history to Modern)

Folk, Tribal and current trends in Art Scenario.

**Practical : (conducted by the Department)**

For admission in M.F.A in Painting candidate has to appear in Practical Test of 100 marks. Life Drawing, **Time: 180 minutes of 100 marks** in charcoal/Pastel/Water colour (The Practical test will be conducted by the Department . For

Practical test half imperial size paper will be given. The candidates are advised to

contact the Head, Visual Arts Department for Practical Test.)

**Interview : 50 Marks (conducted by the Department)**