

Unit IV: Global Trends in Malayalam Language

- Global advancement of online Malayalam
- Impact of new TV/Radio Malayalam channels in the advancement of Malayalam language
- Online Encyclopedias and Libraries
- Online books and periodicals

EDU 15 .2: ADVANCED STUDIES: CURRICULUM AND PEDAGOGIC COURSES IN ENGLISH EDUCATION

Unit I: English Language: Origin, History and Development

- Language – Origin and Functions
- English Language – Historical, Philosophical and Socio-Cultural Background.
- English Language – Structure
- Linguistic Concepts – Morphology, Phonology, Syntax, Semantics

Unit II: Trends and Practices in English Language Teaching, Learning and Evaluation

- Aims, Objectives, taxonomies
- Teacher- qualities, skills and competencies
- Micro Teaching – Cycle, Core Skills
- Scope and purpose of Techno- Pedagogic Content Knowledge Analysis.
- Teacher as a Techno Pedagogue
- Psycho-linguistic theories in English language teaching
- Techniques- Methods -Strategies- Approaches- Models
- Development of language skills.
- Teaching of English language elements – Prose, Poetry, Grammar, Vocabulary, Spelling, Composition...
- Research in English Language Teaching-Learning

- Qualities of a good test
- Different test types
- Objective based evaluation
- CCE
- Diagnostic test, Achievement test
- Question bank with different test items- LOT & HOT questions
- Modern trends in evaluation – Reflective Assessment, Portfolio, Rubrics

Unit III: Curriculum and Learning Resources in English Language Teaching

- Curriculum – Definition, Principles in the Construction of English Language Curriculum, Syllabus
- Brief outline of NCF (2005) and KCF (2007)
- Formal, Informal and Non-formal learning contexts
- Community Resources
- Instructional Materials, Language lab.
- Digital Resources- Blogs, e-journals, podcasts, e-learning, m-learning, Web-based learning
- Resources for students with Learning Difficulties
- MOOC, Virtual learning
- Learning Management System

Unit IV: Unit 4 Global Trends in English Language Education

- Importance of English Language in the present day world.
- Global advancement of English Language in the ICT world.
- Worldwide opportunities for English language and literature experts/professionals in the field of ICT oriented jobs.

SEMESTER IV

EDU – 15.7 : ADVANCED STUDIES : CURRICULUM AND PEDAGOGIC COURSES IN MATHEMATICS EDUCATION

(Theoretical Discourse - 60 hrs, CE - 30 hrs)

Course Objective(CO):

Enable the student teachers to:

- CO 1 understand the concept of teaching- learning process.
- CO 2 understand and develop skill in selecting appropriate aims and objectives for teaching Mathematics.
- CO 3 To identify the changing roles of the teacher
- CO 4 familiarize and apply the instructional management strategies of teaching Mathematics.
- CO 5 understand and apply online assessment and competency enhancement avenues.
- CO 6 identify net working as a means of personal and professional growth
- CO 7 develop skill in the preparation of different types of schedules and matrix for assessing performance.
- CO 8 To understand and practice various models of teaching in classrooms
- CO 9 prepare different types of test items for assessment.
- CO 10 To understand and practice modern methods of assessment
- CO 11 Develop skill in constructing and administering Achievement test & Diagnostic tests.
- CO 12 familiarize & understand about Modern Trends in Evaluation like Continuous comprehensive evaluation& Rubrics designing
- CO 13 To understand the meaning of reflective practices to prepare tools for evaluation of reflective practices

CONTENT

Unit 1: Exploring Content and Pedagogic Knowledge

- Content knowledge and Pedagogic content knowledge of secondary school Mathematics syllabus prescribed by SCERT
- Mathematical skills, Micro teaching skills and thinking skills
- Advanced learning in different levels of planning

Unit 2: Inquiring into Approaches, Methods, Strategies, and Techniques for Lifelong Learning of Mathematics

- Behaviourist approach - constructivist approach - process approach-Cognitive approach – Personalized - Cooperative – Collaborative (Jigsaw technique/ circle learning/ think-pair and share) - participatory approaches, team teaching approach, mastery learning.
- Project method, problem solving method, Analytic-synthetic method and heuristic Approach
- Models of teaching : Cam, ITM, mastery learning model and discovery model
- Techniques, strategies and activities needed for stimulating creativity and inventiveness in science for lifelong learning - Buzz section, Brain storming, Simulation, role play, discussion, debate, concept mapping , Mathematics club activities
- Motivation, types of motivation, methods of motivating students.
- **Self Instructional Strategies-** Programmed Instruction (Linear, branching), Modular Instruction and CMI
- Education for students with special education needs-slow learners, deprived learners, gifted and creative learners
- Enhanced lifelong learning in Mathematics through Web based learning, E-earning, M-learning, Brain based learning, Experiential learning
- Measures needed for students with special needs

Unit 3: Enriching Assessment in teaching Mathematics

- Taxonomies of Educational Objectives needed for teaching and assessing Mathematics - Bloom's taxonomy, Revised Bloom's taxonomy (2001) and its implications for assessment and stating the objectives – knowledge and cognitive process dimensions, Bloom's digital taxonomy
- Objective based evaluation
- Construction of different types of test items
- Construction of achievement test, and diagnostic test Evaluation
- Recent trends in evaluation – CCE, assessment of student's performance - portfolio - e-portfolio, development of Rubrics for assessing student's performance - online assessment -tools for online assessment - Grading – meaning, types and uses of grading,
- Competitive examinations for students Olympiad, National Talent Search Examination by NCERT
- Competitive/placement examinations for graduates. and post graduates

Unit 4: Professionalizing Mathematics teaching:

- Roles of teacher – teacher as a lifelong learner, teacher as a researcher, teacher as a reflective practitioner, teacher as an educational entrepreneur
- Teacher competencies needed for a Mathematics teacher
- Professionalism-Traits of professionalism required for a teacher - Professional ethics
- Professional growth of teachers - Relevance and scope of Reflective practices in professional development - Continuing Professional Development (CPD) – e-twinning, webinar, video conference, research, summer courses, inservice training and Online Courses (MOOC based and Swayam Platform by UGC)

SEMESTER IV

EDU – 15.8: ADVANCED STUDIES: CURRICULUM AND PEDAGOGIC COURSES IN PHYSICAL SCIENCE EDUCATION

Course Objective(CO):

Enable the student teachers to:

- CO 1 Enrich subject competencies in teaching Physical Science
- CO 2 Integrate various approaches, strategies and techniques in teaching Physical Science
- CO 3 Update the different modern trends in assessment in teaching
- CO 4 Equip with web based teaching and learning
- CO 5 Deal children with special needs
- CO 6 Evaluate students objectively and also objective based
- CO 7 Construct test items to assess different levels of thinking in three domains
- CO 8 Familiarize various competitive/placement examinations for secondary and higher secondary school students, graduates and post graduates
- CO 9 Professionalize teaching through understanding various roles of teacher
- CO 10 Understand various means of professionalization

CONTENT:

Unit 1: Exploring Content Knowledge

a. Physics:

- i. Sound and Light** –Mechanical and electromagnetic waves – Wave motion – Transverse and longitudinal waves –Characteristics of waves – sound wave- speed of sound – resonance – reflection of sound – reverberation - Doppler effect, reverberation, SONAR- Reflection and refraction of light - Optical density, total internal reflection and applications- colour of sky, cloud, snow. Primary colours, secondary colours - complementary colours - Dispersion of light –Scattering of light
- ii. Heat &Electricity** Temperature and temperature scales, modes of heat transmission, boiling, melting, Specific heat capacity, latent heat, regulation- electromagnetic induction, AC, DC Generators, electric motors, transmission of AC, self induction, mutual induction, transformers, moving coil microphones, loud speaker - Static electric properties, electroscopes, electro static induction, Joule’s law of heating

- iii. **Gravitation :** Mass and weight, universal law of gravitation, acceleration due to gravity and factors affecting it, Solar system, orbits, planets, satellite, escape velocity, space exploration and weightlessness in space. Galaxies, stars, big bang, clusters, nebula, Super Nova, solar and lunar eclipse.
- iv. **Electronics:** Conductors, insulators, semi conductors, doping, different types of diodes and applications, transistor and its applications, ICs.

b. Chemistry:

- i. **Atomic structure:** History of atomic structure, Bohr model of atom, electron shell model, stability and electronic configuration
- ii. **Corrosion of metals** - factors responsible for corrosion, prevention of corrosion, reactions of metals with water, air and acids, Displacement reactions of metals, reactivity series
- iii. **Separation of Mixtures** - distillation, fractional distillation, differential extraction using separating funnel, chromatography
- iv. **Periodic table and chemical bonding** - Moseley's periodic law, nature of elements and electronic structure, valency and electro negativity, representative elements, transition elements, sub shell electronic configuration, classification of elements into blocks (s, p, d & f) and their characteristics - ionic bond and covalent bond, , difference in the formation of compounds, comparison of the properties of ionic compounds and covalent compounds,
- v. **Carbon** - Unique nature, allotropes, carbon cycle, green house effect, global warming Organic compounds Classification, catenation, tetra covalency of carbon
- vi. **Chemical kinetics:** Factors influencing rate of reaction - concentration, surface area, temperature and presence of catalyst. **Mole Concept** - Atomic mass and molecular mass, Avogadro's law and mole concept, gram atom and gram molecule, mole concept and balanced chemical equations

Unit 2: Inquiring into Approaches, Methods, Strategies, and Techniques for Lifelong Learning of Physical Science

- Behaviourist approach - constructivist approach - process approach-Cognitive approach – Personalized - Cooperative – Collaborative (Jigsaw technique/ circle learning/ think-pair and share) - participatory approaches
- Issue based and problem based approaches
- Project method, problem solving method, guided discovery method
- Techniques, strategies and activities needed for stimulating creativity and inventiveness in science for lifelong learning - Buzz section, Brain storming, Simulation, role play, discussion, debate, concept mapping , Mind mapping, science club activities, field visit, science exhibition

- Enhanced lifelong learning in Physical Science through Web based learning, E-learning, M-learning, Brain based learning, Experiential learning
- Measures needed for students with special needs

Unit 3: Enriching Assessment in teaching Physical Science

- Taxonomies of Educational Objectives needed for teaching and assessing Physical Science - Bloom's taxonomy, Revised Bloom's taxonomy (2001) and its implications for assessment and stating the objectives – knowledge and cognitive process dimensions, Bloom's digital taxonomy
- Objective based evaluation and objective evaluation
- Construction of different types of test items - (HOT and LOT questions)
- Construction of achievement test, and diagnostic test Evaluation of non-cognitive areas like creativity, skill, and attitude in science learning contexts
- Recent trends in evaluation – CCE, assessment of student's performance - portfolio - e-portfolio, development of Rubrics for assessing student's performance - online assessment -tools for online assessment - Grading – meaning, types and uses of grading,
- Competitive examinations for students NTSE Olympiad (National Talent Search Examination by NCERT), Science Olympiad by Homi Bhabha Centre for Science Education (HBCSE), KVPY (by the Department of Science and Technology). Intel Science Programme, Google Science fair
- Competitive/placement examinations for graduates and post graduates
GATE, GRE, KTET (by Pareekshabhavan), CTET(by CBSE), and SET exam (by LBS)CSIR & UGC NET exam for Junior Research Fellowship and Eligibility for Lectureship (by CSIR & National Testing Agency)

Unit 4: Professionalizing Physical Science teaching:

- Roles of teacher – teacher as a lifelong learner, teacher as a researcher, teacher as a reflective practitioner, teacher as an educational entrepreneur
- Teacher competencies needed for a science teacher-NCTFE
- Professionalism- Traits of professionalism required for a teacher - Professional ethics
- Professional growth of teachers - Relevance and scope of Reflective practices in professional development - Continuing Professional Development (CPD) – e-twinning, webinar, video conference, research, summer courses, in-service training and Online Courses in Science (MOOC based and Swayam Platform by UGC)

EDU – 15. 9 : ADVANCED STUDIES : CURRICULUM AND PEDAGOGIC COURSES IN NATURAL SCIENCE EDUCATION

Course Outcome: Enable the student teachers to:

- CO 1 Enrich subject competencies in teaching Natural Science
- CO 2 Understand the concept of teaching- learning process.
- CO 3 Understand and develop skill in selecting appropriate aims and objectives for teaching natural science.
- CO 4 Develop skill in the preparation of various instructional materials for enhancing the effectiveness of instruction and remediation.
- CO 5 Familiarize and apply the instructional management strategies of teaching natural science
- CO 6 Professionalize teaching through understanding various roles of teacher
- CO 7 Develop a skill in constructing and administering achievement test & diagnostic tests.
- CO 8 Familiarize & understand about Modern Trends in Evaluation like Continuous comprehensive evaluation& Rubrics designing.

CONTENTS:

Unit I : Exploring Content Knowledge

- 1 .Biological classification- 5 Kingdom Classification- Monera ,Protista, Fungi, Plantae, Animalia.
2. Cell : The unit of life- Cell Theory , Cell organelles
3. Principles of inheritance and variation: Mendel's Law of Inheritance – Law of Dominance, Law of Segregation, Law of Independent Assortment
4. Genetic disorders- Mendelian disorders- Hemophilia, Sickle cell anemia, Phenylketonuria, Chromosomal disorders- Down Syndrome ,Klinefelter Syndrome, Turner Syndrome
- 5 .Bio technological applications: in agriculture- BT Cotton, Pest resistant plants
 - : in medicine- genetically engineered insulin, gene therapy, molecular diagnosis (ELISA Test)
 - : Transgenic animals- benefits- biological products, vaccines, chemical safety testing
 - : Ethical issues- bio piracy

Unit II. Instructional Management : Traditional to Digital

- Teacher initiated methods- Lecture method, Lecture cum Demonstration, Biographical
- Student initiated methods- Problem solving, Project method, Guided discovery, Experimental and heuristic method.
- Approaches- Inductive-Deductive, Multimedia, Interdisciplinary and Constructivist approaches.
- Techniques- Seminar, Group discussion, Debate, Brain storming, peer tutoring, team teaching, concept mapping.
- ICT and Multimedia as technology enhanced communication devices in the teaching of life science
- Networking- meaning and scope of Net working in science learning.
- Meaning and importance of planning, Types of planning – Year plan, Unit plan, lesson plan and Resource Unit
- lesson plans based on following approaches and Models of teaching- Herbartian Approach, Constructivist Approach, Concept attainment model(CAM), Inquiry Training Model(ITM), 5E Model
- Teaching skills –Definition, Core teaching skills, Components of teaching skills, Teaching skills specially required for Biology teacher.
- Curriculum-Meaning-functions and, Principles of curriculum construction,
- Approaches to curriculum organization'
- Critical analysis of the prevailing secondary school biology syllabus.
- Curriculum reforms in India(NCERT) & abroad (BSCS).

Unit II. Enriching Assessment in Teaching

- Taxonomies of Educational Objectives needed for teaching and assessing Natural Science-Bloom's Taxonomy. Revised Bloom's Taxonomy, McCormack and Yager's Classification, Bloom's Digital Taxonomy.
- Reflection and feedback- Assessment of student's performance.
- Objective based evaluation.
- Assessment &Evaluation tools
- Question Bank with different test items (HOT, LOT Questions),
- Achievement Test.
- Diagnostic tests &Remedial Teaching.
- Modern Trends in Evaluation.
- Continuous comprehensive evaluation.
- Rubrics for assessing of Assignments, Projects, Debates, Seminars and Discussions.

- Grading- meaning ,types and uses.
- Competitive examinations for students- NTSE, Science Olympiad, Google Science Fair.
- Competitive/ placement examination for graduates & post graduates- KTET(by Pareekshabhavan),CTET (by CBSE),SET(by LBS),CSIR& UGC NET EXAM for Junior Research Fellowship & Eligibility for Lectureship(by CSIR & National Testing Agency).

Unit IV. Professionalizing Natural Science Teaching

- Relevance and scope of Reflective practices in professional development
- Role of teacher- as a lifelong learner, as a researcher, as a reflective practitioner and educational entrepreneur.
- Teacher competencies for Science teaching
- Professionalism- Traits of professionalism required for a science teacher- Professional ethics
- Relevance and scope of Reflective practices in professional development- Continuing Professional Development (CPD) –research-Swayam Platform by UGC.

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EDU – 15.10 : ADVANCED STUDIES : CURRICULUM AND PEDAGOGIC COURSES IN SOCIAL SCIENCE EDUCATION.

Course Objective(CO):

- CO 1 To develop an insight about the world and society we live
- CO 2 To identify and practice modern instructional strategies in Social Science.
- CO 3 To get acquainted with the principles and practices of curricular transactions in the digital era. .
- CO 4 To develop necessary skills and competencies for a teacher in digital era.
- CO 5 To prepare the prospective teachers as reflective practitioner
- CO 6 To inculcate a broad perspectives of social science education from a global perspective

CONTENTS:

Unit 1: Exploring the Content

Unit 2: Revamping Social Science Curriculum

Unit 3: Equipping Social Science Teacher

Unit 4: International Considerations of Social Science Education

UNIT 1 EXPLORING THE CONTENT

Ancient Civilisations of the World- Greek Civilization, Roman Civilization Egyptian Civilisationan , Mesopotamian Civilisation Harappan Civilisation Chinese Civilisation

Revolutions of the World- American Revolution, Glorious Revolution, French Revolution Russian Revolution Chinese Revolution

India and Freedom Movement - First War of Indian Independence- India's struggle towards Freedom. Transfer of power, Post Independent period.

Economic Systems of the World - Capitalism, Socialiosm, Mixed Economy ,Five year planning in India, Sectors of Indian Economy ,

India and its geography- Geographical position of India ,India and its natural Resources Major landforms of the Country.

The Universe - Solar System, Atmosphere , Interior of the Earth

Civics- Constitution of India-Fundamental Rights, Legislature ,Executive and Judiciary.

UNIT II REVAMPING SOCIAL SCIENCE CURRICULUM

- **Social Science teaching in digital era-** need and significance of technological changes in teaching learning process
- **Virtual learning and Blended learning in Social Science-** Scope of virtual learning in Social science and the nature and scope of Blended learning in the present learning environment
- **Behaviourist and constructivist approaches in teaching Social Science-** how the approaches differ in planning and transactional modalities.
- **Global trends in curriculum construction-** recent changes in curriculum construction, learner centered & participatory approaches.
- **Innovative techniques and strategies of teaching Social Science-** modern instructional strategies with constructivist approaches and technological advancement
- **Resource Mapping in Social Science** – Print Vs Non Print Media , Utilisation of Library Laboratory and Clubs in Social Science Education
- **Time sense and Place sense-** Concept , Importance ,Tools for Developing Time sense and Place sense
- **Comparison of Community resources and e-resources-** important community resource items and e-resources, comparison of its availability and utilization in class room situation

UNIT III -EQUIPPING SOCIAL SCIENCE TEACHER

- **Professionalism** - Continuous Professional Development , teacher as a Reflective Practitioner , Competencies and Skills
- **Need of research in teaching learning process-** Action research and its outcomes, recent research findings in the teaching learning process of Social Science

UNIT IV INTERNATIONAL CONSIDERATIONS OF SOCIAL SCIENCE EDUCATION

- **Role of Social science in National and international perspective-** Challenges to Nationalism, need and significance of international understandings, role of Social Science teaching to promote National and International perspectives.
- **Trends and developments in Evaluation-** modern trends in evaluation, CCE, fixing of rubrics and the scope of grading.