

| Subject classification                                                                       | Sub-classification area                                                               | Online Resource (URL) in Hindi and English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|                                                                                              |                                                                                       | UNIT - I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PEDAGOGY OF TEACHING MATHEMATICS                                                             | Unit 1: Nature of Mathematics                                                         | <a href="https://services.math.duke.edu/undergraduate/Handbook96_97/node5.html#:~:text=">https://services.math.duke.edu/undergraduate/Handbook96_97/node5.html#:~:text=</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Introduction                                                                                 | 1.1 Meaning, Nature, Importance and Value of Mathematics                              | <a href="https://www.ucalgary.ca/aslcle/nctm/Q4A.html">https://www.ucalgary.ca/aslcle/nctm/Q4A.html</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| The course will help the student-teachers to generate their student's interest for learning  | 1.2 Axioms, Postulates, Assumptions and Hypothesis in Mathematics                     | <a href="http://www.bhojivirtualuniversity.com/slm/B.Ed_SLM/bedtmb1u1.pdf">http://www.bhojivirtualuniversity.com/slm/B.Ed_SLM/bedtmb1u1.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| maths and develop dispositions towards the subject. It is designed to equip the learners to  | 1.3 Historical Development of Notations and Number Systems                            | <a href="http://www.ncert.nic.in/pdf_files/Final-Article-Role%20of%20Mathematics%20in%20the%20Development%20ofSociety-NCER-.pdf">http://www.ncert.nic.in/pdf_files/Final-Article-Role%20of%20Mathematics%20in%20the%20Development%20ofSociety-NCER-.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| teach maths using innovative methods, techniques and teaching learning material for children | 1.4 Contribution of Mathematicians (Ramanujam, Aryabhata, Bhaskaracharya, Euclid,     | <a href="http://www.ncert.nic.in/departments/nie/desm/publication/pdf/mathematics_hindi.pdf">http://www.ncert.nic.in/departments/nie/desm/publication/pdf/mathematics_hindi.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| with & without disabilities.                                                                 | Pythagoras)                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Objectives                                                                                   | 1.5 Perspectives on Psychology of Teaching and Learning of Mathematics-               | <a href="https://www.prabhasakshi.com/personality/a-celebration-of-math-associated-with-ramanujan">https://www.prabhasakshi.com/personality/a-celebration-of-math-associated-with-ramanujan</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| After completing the course the student-teachers will be able to                             | Constructivism, Enactivism, Vygotskian Perspectives, and Zone of Proximal development | <a href="https://www.itshindi.com/aryabhata.html">https://www.itshindi.com/aryabhata.html</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| • Explain the nature of Mathematics and its historical development with contribution of      |                                                                                       | <a href="https://www.hindilibraryindia.com/biography/biography-of-bhaskaracharya-in-hindi-language/3635">https://www.hindilibraryindia.com/biography/biography-of-bhaskaracharya-in-hindi-language/3635</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Mathematicians.                                                                              |                                                                                       | <a href="https://jivani.org/Biography/689/%E0%A4%AF%E0%A5%82%E0%A4%95%E0%A5%8D%E0%A4%B2%E0%A4%BF%E0%A4%A1%E0%A4%9C%E0%A5%80%E0%A4%B5%E0%A4%A8%E0%A5%80---biography-of-euclid-in-hindi-jivani">https://jivani.org/Biography/689/%E0%A4%AF%E0%A5%82%E0%A4%95%E0%A5%8D%E0%A4%B2%E0%A4%BF%E0%A4%A1%E0%A4%9C%E0%A5%80%E0%A4%B5%E0%A4%A8%E0%A5%80---biography-of-euclid-in-hindi-jivani</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| • Describe the aims and objectives of teaching Mathematics at school level.                  |                                                                                       | <a href="https://www.eklavya.in/magazine-activity/sandarbh-magazines/298-sandarbh-from-issue-51-to-60/sandarbh-issue-58/1169-euclid-ke-swasidh">https://www.eklavya.in/magazine-activity/sandarbh-magazines/298-sandarbh-from-issue-51-to-60/sandarbh-issue-58/1169-euclid-ke-swasidh</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| • Demonstrate and apply skills to select and use different methods of teaching               |                                                                                       | <a href="http://www.bhojivirtualuniversity.com/slm/B.Ed_SLM/bedcgb3u5.pdf">http://www.bhojivirtualuniversity.com/slm/B.Ed_SLM/bedcgb3u5.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Mathematics.                                                                                 | Unit 2: Objectives and Instructional Planning in Mathematics                          | <a href="http://egyankosh.ac.in/bitstream/123456789/7185/1/Unit-2.pdf">http://egyankosh.ac.in/bitstream/123456789/7185/1/Unit-2.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| • Demonstrate competencies of planning for teaching Mathematics, organizing                  | 2.1 Aims and Objectives of Teaching Mathematics in Elementary and Secondary Schools   | <a href="http://mooc.nios.ac.in/mooc/pluginfile.php?file=/12298/course/summary/%E0%A4%87%E0%A4%95%E0%A4%BE%E0%A4%88-3%20%E0%A4%97%E0%A4%A3%E0%A4%BF%E0%A4%A4%20%E0%A4%B6%E0%A4%BF%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%BE%20%E0%A4%95%E0%A5%87%20%E0%A4%89%E0%A4%A6%E0%A5%87%E0%A4%B6%E0%A5%8D%E0%A4%AF%20%E0%A4%8F%E0%A4%B5%E0%A4%82%20%E0%A4%AA%E0%A4%B0%E0%A4%BF%E0%A4%AA%E0%A5%8D%E0%A4%B0%E0%A5%87%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A5%8D%E0%A4%AF.pdf">http://mooc.nios.ac.in/mooc/pluginfile.php?file=/12298/course/summary/%E0%A4%87%E0%A4%95%E0%A4%BE%E0%A4%88-3%20%E0%A4%97%E0%A4%A3%E0%A4%BF%E0%A4%A4%20%E0%A4%B6%E0%A4%BF%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A4%BE%20%E0%A4%95%E0%A5%87%20%E0%A4%89%E0%A4%A6%E0%A5%87%E0%A4%B6%E0%A5%8D%E0%A4%AF%20%E0%A4%8F%E0%A4%B5%E0%A4%82%20%E0%A4%AA%E0%A4%B0%E0%A4%BF%E0%A4%AA%E0%A5%8D%E0%A4%B0%E0%A5%87%E0%A4%95%E0%A5%8D%E0%A4%B7%E0%A5%8D%E0%A4%AF.pdf</a> |
| laboratory facilities and equipment designing pupil centered teaching                        | 2.2 Bloom's Taxonomy of Educational Objectives and Writing Objectives in              | <a href="https://hi.vikaspedia.in/education/teachers-corner/bloom-s-taxonomy-of-learning-domains">https://hi.vikaspedia.in/education/teachers-corner/bloom-s-taxonomy-of-learning-domains</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| learning experiences.                                                                        | Behavioural Terms                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| • Demonstrate skills to design and use various evaluation tools to measure learner           | 2.3 Lesson Planning– Importance and Basic Steps. Planning Lesson of Arithmetic,       | <a href="http://egyankosh.ac.in/bitstream/123456789/7185/1/Unit-2.pdf">http://egyankosh.ac.in/bitstream/123456789/7185/1/Unit-2.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| achievement in Mathematics.                                                                  | Algebra and Geometry                                                                  | <a href="http://scert.cg.gov.in/ded1styear/mathspartwise/mathspart4%20207-272.pdf">http://scert.cg.gov.in/ded1styear/mathspartwise/mathspart4%20207-272.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                              | 2.4 Unit Planning – Format of A Unit Plan                                             | <a href="http://egyankosh.ac.in/bitstream/123456789/47257/1/Unit-3.pdf">http://egyankosh.ac.in/bitstream/123456789/47257/1/Unit-3.pdf</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                              | Pedagogical Analysis: Meaning and Need and Procedure for Conducting Pedagogical       | <a href="https://edufocus.blogspot.com/2014/08/pedagogic-analysis.html">https://edufocus.blogspot.com/2014/08/pedagogic-analysis.html</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                              | Analysis. Classification of Content, Objective, Evaluation, etc                       | <a href="http://anildcscollege.blogspot.com/2014/06/pedagogical-analysis-and-planning.html">http://anildcscollege.blogspot.com/2014/06/pedagogical-analysis-and-planning.html</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                              | Unit 3: Strategies for Learning and Teaching Mathematics                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                              | 3.1 Concept Formation and Concept Attainment: Concept Attainment Model for Learning   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                              | and Teaching of Concepts                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                              | 3.2 Learning By Exposition: Advanced Organizer Model                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                              | 3.3 Methods of Teaching- Lecture, Discussion, Demonstration, Inductive-Deductive,     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                              | Analytic-Synthetic, Problem-Solving, And Project                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



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|  | 3.4 Techniques of Teaching Mathematics: Oral Work, Written Work, Drill-Work, Brain-        |  |
|  | Storming and Computer Assisted Instruction (CAI)                                           |  |
|  | 3.5 Creating Different Situations of Learning Engagement: Group Learning, Individual       |  |
|  | Learning, Small-Group, Cooperative (Peer-Tutoring, Jigsaw, etc.), and Situational/         |  |
|  | Contextual Learning                                                                        |  |
|  | Unit 4: Teaching-Learnin                                                                   |  |
|  | g Resources in Mathematics for Students with Disabilities                                  |  |
|  | 4.1 Mathematics Laboratory- Concept, Need, and Equipment for Setting Up a                  |  |
|  | Mathematics Laboratory                                                                     |  |
|  | 4.2 Utilization of Learning Resources in Mathematics: Charts and Pictures, Weighing and    |  |
|  | Measuring Instruments, Drawing Instruments, Models, Concrete Materials, Surveying          |  |
|  | Instruments With Reference To Children With Disabilities                                   |  |
|  | 4.3 Bulletin Boards and Mathematics Club                                                   |  |
|  | 4.4 Abacus, Cussionaire Rods, Fractional Discs, Napier Strips                              |  |
|  | 4.5 Calculators, Computers, Smart Boards, Multimedia Presentations, and Special Aids       |  |
|  | and Appliances For Children With Disabilities                                              |  |
|  | Unit 5: Assessment and Evaluation for Mathematics Learning                                 |  |
|  | 5.1 Assessment and Evaluation- Concept, Importance and Purpose                             |  |
|  | 5.2 Error Analysis, Diagnostic Tests, Identification of Hard Spots and Remedial Measures   |  |
|  | 5.3 Tools and Techniques for Formative and Summative Assessments of Learner                |  |
|  | Achievement in Mathematics, Comprehensive and Continuous Evaluation in                     |  |
|  | Mathematics                                                                                |  |
|  | 5.4 Preparation of Diagnostic and Achievement Test                                         |  |
|  | 5.5 Adaptations in Evaluation Procedure for Students With Disabilities                     |  |
|  | Practical/ Field Engagement/ Project Work                                                  |  |
|  | Any one of the following                                                                   |  |
|  | I. Pedagogical analysis of a unit of content from secondary school Mathematics             |  |
|  | Syllabus                                                                                   |  |
|  | II. Preparation of a multimedia presentation on a topic with special reference to students |  |
|  | with disabilities                                                                          |  |
|  | III. Construction of a question paper based on current CBSE format/concerned State         |  |
|  | Board of education, preparing its Scoring key, and marking scheme                          |  |
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|  | IV. Analyzing errors committed by school children in Mathematics and preparing a |  |
|  | remedial plan                                                                    |  |
|  | V. Developing an Action Research proposal for a problem related to teaching and  |  |
|  | learning of Mathematics with reference to students with disabilities             |  |
|  | Transactions                                                                     |  |
|  | Lecture cum demonstration, Workshops and Seminars                                |  |
|  | Essential Readings                                                               |  |