Bachelor of Education (B.Ed.)

Title of the Course: P.2.10 B: Mathematics
(Semester: II)

Credits: 2
MM: 50 (External: 35 Internal: 15)
Contact Week: 15

Introduction of the Course

Through this course, the student-teachers will be able to discern the various types of Lesson planning and their uses. Student teachers will be able to understand the various methods that are used for assessment and evaluation at the school level. The learnings from this course will help student teachers prepare for their internships in schools. It also highlights the policy perspectives of including mathematics as a disciplinary subject in school curriculum

Learning Outcomes

After completion of the course student will be able to:

1. Develop teaching strategies and assessment practices for engaging classroom cultures that enhance conceptual understanding of diverse learners.
2. Facilitate their understanding of concepts through questions and activities that can be suitably used with children to help them build complex mathematical understanding.
3. Challenged to refine, review and explain their thinking without falling back on standard rules and procedures.

Number of Units: 3 **Weeks 15 = 30 hours**

Unit 1: Policy Perspectives of Mathematics at School Level (4weeks = 8 hours)

- Place of Mathematics in school curriculum such as NCF 2005 and NCF 2022
- Recommendations of various agencies: National and International documents on Mathematics at school level, with specific reference to middle and Secondary stage of schooling.

Unit 2: Designing and Planning a Unit and Lessons (6weeks = 12 hours)

- Studying the curriculum: relating to what is worth knowing and experiencing in mathematics, understanding the nuances between intended curriculum and implemented curriculum.
- Developing unit plans and concept maps.

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विभागाध्यक्ष एवं संकाय अध्यक्ष
शिक्षा विभाग-Deptt. of Education
दिल्ली विश्वविद्यालय, दिल्ली-110007
University of Delhi, Delhi-110007

- Designing constructive lesson plans. Designing Process-based lesson plans.
- Understanding the role of communication, mathematical community and group dynamics in classrooms
- Critical engagement with ICT, mathematics laboratory, simulations and mathematical modelling in promoting mathematical thinking

Unit 3: Assessment and Evaluation **(5weeks = 10 hours)**

- Critical role of assessment in enhancing learning-Explore diverse methods and tools of assessing an array of learning/performance outcomes of diverse learners, relationship of assessment with self-esteem, motivation, and identity as learners, assessment for learning and role of feedback
- Traditional assessment vs. assessment within a constructivist paradigm. Engaging critically with the existing system of assessment, analysing its shortcomings. Understanding and suggesting ways for creating a continuum between assessment and learning.
- Assessing reasoning, argumentation and logical thinking in mathematics - Performance based assessment

Practicum/ Suggested Projects / Assignments (Any Two)

1. Make Unit Plans on any topic of your choice.
2. Study the different types of Lesson planning in mathematics. Make a lesson plan on each of the process skills of mathematics
3. Pick at least five question papers of CBSE and analyse the difficulty and discrimination of questions in them.
4. Develop a detailed lesson plan for teaching a specific math concept to a particular grade level. Include measurable learning objectives, planned instructional strategies, and assessments.
5. Create a microteaching video delivering a 5–10-minute math lesson. Focus on clear explanations, engaging delivery, and strong mathematics classroom management.
6. Construct a math assessment with 10 problems aligned to standards. Include multiple choice, short answer, and multi-step problems. Provide an answer key and grading rubric.
7. Develop differentiated lesson extensions, remediation plans, and accommodation strategies for diverse learners. Align plans to Individualized Education Programs (IEPs).
8. Observe a peer's math lesson. Provide written constructive feedback analyzing their instructional strategies, classroom management, and student engagement.

Note: On the basis of the above, the teacher may design his/her own relevant projects/ assignments.

Essential/ Recommended Readings

- NCERT.(2006). Syllabus for classes at the elementary level (Vol. 1). New Delhi: NCERT.
- NCERT. (2023). National Curriculum Framework for School Education 2023. New Delhi: NCERT.
- LMT. IGNOU Series.

Head/Dean
विभागाध्यक्ष एवं संकाय अध्यक्ष
Head/Dean, Deptt. of Education
दिल्ली विश्वविद्यालय, दिल्ली-110007
University of Delhi, Delhi-110007

- NCERT.(2006). Position paper-National focus group on assessment(NCF 2005). New Delhi: NCERT. Swaffield, S. (2011).Getting to the heart of authentic assessment for learning, Assessment in Education: Principles, Policy & Practice, 18(4), 433-449.
- Gandhi, H. (2021). Assessment of Learning. Pearson Publications
- Kanvaria, V. K. (2011). *Developing a standardized achievement test: Vinod's trigonometry achievement test.* LAP, Germany. ISBN 9783844322255.
- Kanvaria, V. K. (2012). ICT-pedagogy integration in learning mathematics. In H. K. Senapaty (Coord.), *Pedagogical usage of ICT for teacher educators (pp. 129-136).* RIE (NCERT), Bhubaneswar.

Additional Readings

- Boaler, J. (2013). Ability and Mathematics: The mindset revolution that is reshaping education. FORUM, 55, 1, 143-152.
- Boesen, J., Lithner, J., & Palm, T. (2010).The relation between types of assessment tasks and the mathematical reasoning students use. Educational Studies in Mathematics, 75, 89–105.
- Cooper, B., & Dunne, M. (1998).Any one for tennis? Social class differences in children's responses in national curriculum mathematics testing. The Sociological Review, 46(1), 115-148
- Grant, D. A. (2000). What's on the test? An analytical framework and findings from an examination of teachers' math tests. Educational Assessment, 6(4), 221-256.
- Hamilton, T. M. (2010). Mathematics learners and mathematics textbooks: A question of identity? Whose curriculum? Whose mathematics? Curriculum Journal, 21(1), 3-23.
- Morgan, C., & Watson, A. (2002). The interpretative nature of teacher's assessment of students' mathematics: Issue for equity. Journal for Research in Mathematics Education, 33(2), 78-110.
- Kanvaria, V. K. (2016). *Innovative teaching-learning practices in school mathematics.* VL Media Solution, New Delhi. ISBN 9789386229045
- Kanvaria, V. K., & Sharma, D. (2011). *Evaluating a textbook: A case of class IX mathematics.* VDM, Germany. ISBN 9783639379266.

Teaching Learning Resources (Digital and others)

- https://www.youtube.com/watch?v=V6yixyiJcos. Math isn't hard, it's a language | Randy Palisoc | TEDxManhattanBeach
- https://www.youtube.com/watch?v=HnecUrHgTkc: Making sense of Math | Greg Tang | TEDxAmoskeagMillyard
- https://www.youtube.com/watch?v=GTPSnXpqW4E: Mathematics: how do we make it popular and exciting? Keith Devlin answers
- https://www.youtube.com/@haneetgandhi7828: Do you have mathematical eye?

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Teaching Learning Process

The course will be taught through interactive pedagogic methods such as classroom discussion, debates, film discussions, critical media analysis, collaborative learning tasks which enhance reading comprehension of core writings in the area and innovative projects. Reflective expression and learning will be encouraged.

Assessment Method

The assessment will be formative in nature and will factor in student participation. Individual and group tasks and assignments will be given. Summative evaluation will be done through end-semester examination.

Key words: School Curriculum, Lesson Planning, Assessment and Evaluation

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