

COURSE 7(a): PEDAGOGY OF MATHEMATICS

(Part - I Methodology)

Important questions in PEDAGOGY OF MATHEMATICS

1. <https://www.youtube.com/watch?v=4ePMVsulk0w>
2. <https://www.youtube.com/watch?v=-7y03lW6skA>

Unit I Aims and objectives of teaching Mathematics

Mathematics: Meaning, nature and scope - Aims and objectives of teaching Mathematics in schools – Need and significance of teaching Mathematics - Values of teaching Mathematics.

Unit II Planning for Instruction

Steps in planning a lesson: Setting lesson goals - Designing a unit plan - Designing a lesson plan - Bloom's Taxonomy of educational objectives <https://www.youtube.com/watch?v=n5AyNY6-1f0> – Formulating Instructional objectives at cognitive, affective and psychomotor levels <https://www.youtube.com/watch?v=y6-0bnOepI0> - Structure of a four-fold lesson plan - Preparation of a model lesson plan - Types of test-items -Constructing test-items for formative evaluation in class.

Unit III Practising the Teaching Skills in Mathematics

Meaning of teaching – Understanding major teaching skills: Introducing –explaining https://www.youtube.com/watch?v=lbyKLbGIYQw&list=PLKE7T--B0PBMdnh_TV8yUhYlQhIGhzXxS&index=2 – questioning <https://www.youtube.com/watch?v=Wwr8jMlR7Vo> - varying the stimulus <https://www.youtube.com/watch?v=bUp-y2gwzik> and <https://www.youtube.com/watch?v=20QGeW16gLQ> - non-verbal cues – reinforcement https://www.youtube.com/watch?v=TNDAoYd24q4&list=PLKE7T--B0PBMdnh_TV8yUhYlQhIGhzXxS&index=8 and <https://www.youtube.com/watch?v=YzIf77C81Y> -closure and fluency in communication - Practising a mini-lesson with multiple-teaching skills (for 20 minutes): Observation and feedback on the practice of integration of teaching skills – Understanding major steps in teaching a mini-lesson: Motivation –presentation – interaction - reflection and summing up - Practising a mini-lesson (for 20 minutes): Observation and feedback on mini-teaching.

Unit IV Methods of Teaching Mathematics

Teacher-centered methods: Lecture method – Analytical and Synthetic methods <https://www.youtube.com/watch?v=HVeSoc9u4zg> - Deductive and Inductive methods <https://www.youtube.com/watch?v=H4ZuDBBGoGU> - Demonstration method - Team-teaching. **Learnercentered methods:** Project method - Peer tutoring/teaching by students- Individual activities - experiential learning- Teacher-guided learning- Problem-solving method- Small group/whole-class interactive learning: Student seminar - group discussion -Mixed-ability grouping - Maths through games and puzzles. **Recent trends:** Constructivist learning - Problem-based learning - Brain-based learning – Collaborative learning <https://www.youtube.com/watch?v=7gWS4mxM1Qc> - Flipped learning https://www.youtube.com/watch?v=Ot_dKs_LRf0 - Blended learning <https://www.youtube.com/watch?v=paQCE58334M> - e-Learning trends - Video conferencing.

(Suggested instructional approaches/methods:

- i) Teacher talk/Expert talk on different methods of teaching Mathematics.
- ii) Preparation and presentation of a report on different methods of teaching Mathematics.)

Unit V Resources for Teaching Mathematics

Print resources: Newspapers – Journals – Magazines – Mathematics Encyclopaedias. **Audio resources:** Radio talk - audio tapes - DVDs/CDs. **Visual resources:** Pictures – charts – posters – photographs - flash cards - models. **ICT resources:** Radio – TV –Internet – multimedia - interactive whiteboard. **Community resources:** Fieldtrips - Mathematics exhibition/fair - Mathematics Laboratory/ Mathematics Resource centre - Mathematics club – Qualities of a good Mathematics textbook - Qualities of a Mathematics teacher.