

**CENTRAL UNIVERSITY OF HARYANA**  
**School of Education**

**Teaching Plan**

Programme: B.Ed.

Year: I

Course Code- SOE020213C3104

Credit: 04

Name of Teacher: Dr. Pooja Walia

Session: 2018-20

Semester-II

Course Title: Pedagogy of Mathematics

Maximum Marks: 100

**1. Teaching and Examination Scheme:**

Teaching Scheme (Unit wise Division of Teaching hours)				Examination Scheme		
				CIA	TEE	Total Marks
Unit	L	T/P	(L+T+P)	30 Marks	70 Marks	100 Marks
I	12	4	16			
II	8	8	16			
III	10	6	16			
IV	10	6	16			
<b>TOTAL</b>	40	24	64	<b>30 Marks</b>	<b>70 Marks</b>	<b>100 Marks</b>

Legends: L- Lecture, T-Tutorial/Teacher Guided Student Activity, P- Practicum/Practical.  
CIA-Continuous Internal Assessment and TEE- Term End Examination

**2. Unit-wise Teaching Plan:**

Unit/Topic	Approximate Hours (Lecture/ Tutorial/ Practicum/ Practical)	Content Outlines/Teaching Points	Teaching Strategies	Learning Outcomes	Evaluation Strategies	Suggested Learning Resources
<b>Unit I: Mathematics as a School subject</b>  (i) Meaning, Nature, Scope and Significance of teaching mathematics  (ii) Meaning and building blocks of mathematics-undefined terms,	16 Hr	1.1 Meaning Nature & Scope of Teaching Mathematics of Mathematics 1.2 Significance of Teaching Mathematics of Mathematics 2.1 Meaning and building blocks of mathematics 2.1.1 Undefined terms	Lecture Cum Discussion	<b>On completion of this unit the students will be able to:</b> (i) Explain the meaning and nature of Mathematics (ii) Understand building blocks of Mathematics	Students' will prepare assignment and present their views/ideas	<b>Suggested Readings</b> <ul style="list-style-type: none"> <li>• <a href="https://www.youtube.com/watch?v=2AqXZJD92Ig">https://www.youtube.com/watch?v=2AqXZJD92Ig</a></li> <li>• <a href="https://www.amazon.in/Teaching-Mathematics-Re-Enlarged-Pb/dp/8120717473/ref=sr_1_3?ie=UTF8&amp;qid=1546582521&amp;sr=1-3&amp;keywords=teaching+of+mathematics">https://www.amazon.in/Teaching-Mathematics-Re-Enlarged-Pb/dp/8120717473/ref=sr_1_3?ie=UTF8&amp;qid=1546582521&amp;sr=1-3&amp;keywords=teaching+of+mathematics</a></li> <li>• <a href="https://www.youtube.com/watch?v=oEMOEjQocgY">https://www.youtube.com/watch?v=oEMOEjQocgY</a></li> </ul>

<p>definitions, axioms, postulates</p> <p>(iii) Correlation of Mathematics with other school subjects</p> <p>(iv) Contribution of Great mathematicians(Aryabhata, Bhaskaracharya, Ramanujan, Brahmgupta, Pythagores)</p> <p>(v) Position Paper of National Focus Group on Mathematics(NCF2005)</p>		<p>2.1.2 Definitions 2.1.3 Axioms 2.1.4 Postulates</p> <p>3.1. Correlation of Mathematics with other school subjects</p> <p>4.1 Contribution of Great mathematicians 4.1.1 Aryabhata 4.1.2 Bhaskaracharya 4.1.3 Ramanujan 4.1.4 Brahmgupta 4.1.4 Pythagores</p> <p>5.1 Position Paper of National Focus Group on Mathematics(NCF2005)</p>		<p>(iii) Correlate of Mathematics with other school subjects</p> <p>(iv) Appreciate the Contribution of Great mathematicians</p> <p>(v) Position Paper of National Focus Group on Mathematics(NCF2005)</p>	<p>on Contribution of Mathematicians and Position Paper of National Focus Group on Mathematics(NCF2005)</p> <p>&amp;</p> <p>Unit Test I</p>	<ul style="list-style-type: none"> <li>NCERT (2006). <i>Position paper-national focus group on teaching of mathematics</i>. New Delhi: NCERT.</li> </ul>
<p><b>Unit II: Aims, Objectives and Skills of teaching Mathematics</b></p> <p>(i) Aims and Objectives of teaching mathematics</p> <p>(ii) Bloom's Taxonomy of Instructional Objectives</p> <p>(iii) Approaches of Formulation of instructional objectives in Behavioural Term: Robert Mager's, Robert Miller's RCEM(Regional College of Education Mysore)</p> <p>(iv) Basic Skills of Teaching Mathematics: Introducing the Lesson, Probing Question, Explanation, Illustration with Examples. Stimulus Variation, Board Writing</p>	<p><b>16Hrs</b></p>	<p>1.1 Aims and Objectives of teaching mathematics</p> <p>2.1 Bloom's Taxonomy of Instructional Objectives</p> <p>3.1 Approaches of Formulation of instructional objectives in Behavioural Term</p> <p>3.1.1 Robert Mager's 3.1.2 Robert Miller's 3.1.3 RCEM(Regional College of Education Mysore)</p> <p>4.1 Basic Skills of Teaching Mathematics: 4.1.1 Introducing the Lesson 4.1.2 Probing Question 4.1.3 Explanation 4.1.4 Illustration with Examples 4.1.5 Stimulus Variation 4.1.6 Board Writing</p>	<p>Lecture Cum Discussion</p> <p>Lecture Cum Demonstration</p>	<p>(i) Formulate Aims and Objectives of teaching mathematics</p> <p>(ii) Familiarize with Bloom's Taxonomy of Instructional Objectives</p> <p>(iii) Formulate of instructional objectives in Behavioural Term</p> <p>(iv) Master in Basic Skills of Teaching Mathematics</p>	<p>Students will present assignment on Formulation of Instructional Objectives in Behavioural Terms in context of Different approaches</p> <p>Students will demonstrate various teaching skills</p>	<ul style="list-style-type: none"> <li><a href="https://www.amazon.in/TEACHING-MATHEMATICS-Dr-Anice-James/dp/8183165648/ref=pd_sbs_14_1?_encoding=UTF8&amp;pd_rd_i=8183165648&amp;pd_rd_r=2665dd1e-0fe8-11e9-94ac-7febaac1acc8&amp;pd_rd_w=bhceW&amp;pd_rd_wg=VqZj7&amp;pf_rd_p=9fc668a0-2aac-4fb6-970f-606919bc0185&amp;pf_rd_r=3TKDX6JDT4YCO0YA3FAQ&amp;pse=1&amp;refRID=3TKDX6JDT4YCO0YA3FAQ">https://www.amazon.in/TEACHING-MATHEMATICS-Dr-Anice-James/dp/8183165648/ref=pd_sbs_14_1?_encoding=UTF8&amp;pd_rd_i=8183165648&amp;pd_rd_r=2665dd1e-0fe8-11e9-94ac-7febaac1acc8&amp;pd_rd_w=bhceW&amp;pd_rd_wg=VqZj7&amp;pf_rd_p=9fc668a0-2aac-4fb6-970f-606919bc0185&amp;pf_rd_r=3TKDX6JDT4YCO0YA3FAQ&amp;pse=1&amp;refRID=3TKDX6JDT4YCO0YA3FAQ</a></li> <li>Nickson, M. (2006). <i>Teaching and Learning Mathematics: A Guide to Recent Research and its Application</i>. London: Continuum.</li> <li>Pandya, B. (2007). <i>Teaching of Mathematics</i>. Agra: Radha Prakashan Mandir.</li> <li>Paul Chambers (2008). <i>Teaching Mathematics: Developing as a Reflective Secondary Teacher</i>. New Delhi: Sage Publication.</li> <li>Teaching of Mathematics, NCERT <a href="http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/PDF/teaching_maths.pdf">http://www.ncert.nic.in/departments/nie/dse/activities/advisory_board/PDF/teaching_maths.pdf</a></li> </ul>
<p><b>Unit III: Methods, Techniques and Resources of Teaching of Mathematics</b></p> <p>(i) Difference between Methods &amp; Techniques</p> <p>(ii) Methods of Teaching Mathematics: Inductive-</p>	<p><b>16Hrs</b></p>	<p>1.1 Difference between Methods &amp; Techniques</p> <p>2.1 Methods of Teaching Mathematics</p> <p>2.1.1 Inductive- Deductive Method</p>	<p>Lecture Cum Demonstration</p>	<p>(i) Differentiate between Methods &amp; Techniques</p> <p>(ii) Select appropriate methods of teaching mathematics at</p>	<p>Students will present assignment on Formulation of Instructional Objectives in Behavioural Terms in</p>	<ul style="list-style-type: none"> <li><a href="https://www.youtube.com/watch?v=Bw_o7Sanjks">https://www.youtube.com/watch?v=Bw_o7Sanjks</a></li> <li><a href="https://www.amazon.in/Methods-Teaching-Mathematics-Dr-G-ViswNKathappa-Somashekar/dp/B00KLAGIHW/ref=pd_bxgy_14_img_3?_encoding=UTF8&amp;pd_rd_i=B00KLAGIHW&amp;pd_rd_r=3f34279e-">https://www.amazon.in/Methods-Teaching-Mathematics-Dr-G-ViswNKathappa-Somashekar/dp/B00KLAGIHW/ref=pd_bxgy_14_img_3?_encoding=UTF8&amp;pd_rd_i=B00KLAGIHW&amp;pd_rd_r=3f34279e-</a></li> </ul>

<p>Deductive Method, Analytic – Synthetic Method, Lecture Cum Demonstration Method, Laboratory Method, Activity Based Method, Project Method, Problem Solving Method</p> <p>(iii) Techniques of Teaching Mathematics: Oral, Written, Assignment, Drill &amp; Homework</p> <p>(iv) Mathematics Text Book, Mathematics Labs, Mathematics Club, Mathematics Library, ICT equipped classroom, Mathematics Learning Software, Audio- Visual Aids</p>		<p>2.1.2 Analytic –Synthetic Method</p> <p>2.1.3 Lecture Cum Demonstration Method</p> <p>2.1.4 Laboratory Method</p> <p>2.1.5 Activity Based Method</p> <p>2.1.6 Project Method</p> <p>2.1.7 Problem Solving Method</p> <p>3.1 Techniques of Teaching Mathematics</p> <p>3.1.1 Oral</p> <p>3.1.2 Written</p> <p>3.1.3 Assignment</p> <p>3.1.4 Drill</p> <p>3.1.5 Homework</p> <p>4.1 Resources of Mathematics Teaching</p> <p>4.1.1 Mathematics Text Book</p> <p>4.1.2 Mathematics Labs</p> <p>4.1.3 Mathematics Club</p> <p>4.1.4 Mathematics Library</p> <p>4.1.4 ICT equipped classroom</p> <p>4.1.5 Mathematics Learning Software, Audio- Visual Aids</p>	<p>onstration</p>	<p>secondary level</p> <p>(iii) Plan their lesson to connect life outside the school</p> <p>(iv) Explore new strategies to plan lesson</p> <p>(v) Select appropriate teaching strategies of teaching mathematics at elementary and secondary level</p> <p>(vi) Select appropriate teaching resources of teaching mathematics at elementary and secondary level</p>	<p>context of Different approaches</p> <p>Students will demonstrate various teaching skills</p> <p>&amp; Unit Test II</p>	<p><a href="https://www.amazon.in/Pedagogy-Mathematics-K-N-Krishna-Kumar/dp/9385877364/ref=pb_sbs_14_3?_encoding=UTF8&amp;pd_rd_i=9385877364&amp;pd_rd_r=6604552a-0fe8-11e9-b03f-335cd7f8e6f5&amp;pd_rd_w=BjNY5&amp;pd_rd_wg=QWmgZ&amp;pf_rd_p=9fc668a0-2aac-4fb6-970f-606919bc0185&amp;pf_rd_r=GVFETZZSTD9HVN7AS4Q3&amp;psc=1&amp;refRID=GVFETZZSTD9HVN7AS4Q3">0fe9-11e9-b458-5b4765bb64ca&amp;pd_rd_w=szolo&amp;pd_rd_wg=ZWSD9&amp;pf_rd_p=551e4288-393c-4ac8-ba3a-1e2f5c9994b8&amp;pf_rd_r=JK88FTJ78B3RN2NGYP7D&amp;psc=1&amp;refRID=JK88FTJ78B3RN2NGYP7D</a></p> <ul style="list-style-type: none"> <li>Rao, N.M. (2007). <i>A Manual of Mathematics Laboratory</i>. New Delhi: Neelkamal Publications.</li> <li>Reeve, W.D. (1954). <i>Mathematics for the Secondary School</i>. New York: Holt, Rinehart and Winston, Inc.</li> <li>Russel, J. (2007). <i>Teaching of mathematics</i>. New Delhi: Campus Books International.</li> <li>Servais, W., and Varga, T. (ed.) (1971). <i>Teaching School Mathematics. A UNESCO Source Book</i>. UNESCO, Penguin books.</li> <li>Shah G.B. (1964). <i>New Dimensions in teaching of Mathematics</i>. Baroda: CASE.</li> </ul>
<p><b>Unit IV: Planning &amp; Evaluation</b></p> <p>(i) Planning: Yearly, Unit and Lesson</p> <ul style="list-style-type: none"> <li>Meaning, Need and Importance, Qualities of Good Lesson Plan</li> <li>Approaches of Lesson planning: Herbertian and Constructivist</li> </ul> <p>(ii) Evaluation</p> <ul style="list-style-type: none"> <li>Formative and Summative Evaluation ,</li> <li>Continuous and</li> </ul>	<p>16 Hrs</p>	<p>1.1 Meaning and Nature of Planning</p> <p>1.1.1 Yearly Planning</p> <p>1.1.2 Unit Planning</p> <p>1.1.3 Lesson Planning</p> <p>1.1.3.1 Meaning &amp; Need of Lesson Plan</p> <p>1.1.3.2 Qualities of Good Lesson Plan</p>	<p>Lecture Cum Discussion Method</p>	<p>(i) Explain the difference between Yearly, Unit and Lesson</p> <p>(ii) Enumerate the qualities of good lesson plan</p> <p>(iii) Familiarize with approaches of Lesson Planning</p> <p>(iv) Differentiate between various</p>	<p>Students will present assignment on Planning and Evaluation</p> <p>Power point presentation on Topic Evaluation</p>	<p><a href="https://www.amazon.in/Pedagogy-Mathematics-K-N-Krishna-Kumar/dp/9385877364/ref=pb_sbs_14_3?_encoding=UTF8&amp;pd_rd_i=9385877364&amp;pd_rd_r=6604552a-0fe8-11e9-b03f-335cd7f8e6f5&amp;pd_rd_w=BjNY5&amp;pd_rd_wg=QWmgZ&amp;pf_rd_p=9fc668a0-2aac-4fb6-970f-606919bc0185&amp;pf_rd_r=GVFETZZSTD9HVN7AS4Q3&amp;psc=1&amp;refRID=GVFETZZSTD9HVN7AS4Q3">https://www.amazon.in/Pedagogy-Mathematics-K-N-Krishna-Kumar/dp/9385877364/ref=pb_sbs_14_3?_encoding=UTF8&amp;pd_rd_i=9385877364&amp;pd_rd_r=6604552a-0fe8-11e9-b03f-335cd7f8e6f5&amp;pd_rd_w=BjNY5&amp;pd_rd_wg=QWmgZ&amp;pf_rd_p=9fc668a0-2aac-4fb6-970f-606919bc0185&amp;pf_rd_r=GVFETZZSTD9HVN7AS4Q3&amp;psc=1&amp;refRID=GVFETZZSTD9HVN7AS4Q3</a></p> <ul style="list-style-type: none"> <li>Singh, H., Avtar, R. &amp; Singh, V.P. (2008). <i>A Handbook for</i></li> </ul>

<p>Comprehensive Evaluation,  <ul style="list-style-type: none"> <li>Tools and Techniques of Evaluation</li> </ul> </p> <p>(iii) Construction of An Achievement Test with Blue Print</p>		<p>1.1.3.3 Approaches of Lesson planning: Herbertian and Constructivist</p> <p>2.1 Meaning &amp; Concept of Evaluation</p> <p>2.1.1 Types of Evaluation</p> <p>2.1.2 Formative Evaluation</p> <p>2.1.3 Summative Evaluation</p> <p>2.1.4 Continuous Evaluation</p> <p>2.1.5 Comprehensive Evaluation</p> <p>2.2 Tools and Techniques of Evaluation</p> <p>3.1 Construction of An Achievement Test with Blue Print</p>	<p>Lecture  Cum  Demonstration  Method</p>	<p>types of Evaluation</p> <p>(v) Apply a variety of assessment techniques and practices by formal or informal ways</p> <p>(vi) construct appropriate assessment tools for evaluating mathematics learning</p>	<p>Construct an achievement test with Blue Print</p>	<p><i>Designing Mathematics.</i></p> <ul style="list-style-type: none"> <li>Siddiqui, M.H.(2009). <i>Teaching of mathematics.</i> New Delhi: APH Publishing House</li> </ul> <p><a href="http://www2.rgu.ac.uk/celt/pgcertilt/evaluating/eval1.htm">http://www2.rgu.ac.uk/celt/pgcertilt/evaluating/eval1.htm</a></p>
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**Internal Assessment Strategies:**

The Thirty marks have been allotted under Internal Assessment. The following activities will be executed under Internal Assessment:

S. No.	Activity	Mode	Weight age of Marks
1	Two Sessional tests will be conducted.(Best one will be counted)	Test	10
2	Preparation of an assignment on various topics and it is followed by presentation in the classroom <b>(Group activity)+ Presentation on lesson Plans on various method using teaching skills</b>	Assignment & Presentation (PPT)	05+10
3	Percentage of attendance	---	05
	<b>Total Marks</b>		<b>30</b>