<table>
<tr><td>Course Code</td><td colspan="5">PEU4303</td></tr>
<tr><td>Level</td><td colspan="5">04</td></tr>
<tr><td>Course Title</td><td colspan="5">Group Theory- I</td></tr>
<tr><td>Credit value</td><td colspan="5">3</td></tr>
<tr><td>Core/Optional</td><td colspan="5">Core. for Pure Mathematics as major discipline</td></tr>
<tr><td>Prerequisites</td><td colspan="5">PEU3301(Pass /Valid OCAM/CR)</td></tr>
<tr><td rowspan="2">Hourly breakdown</td><td colspan="2">Theory</td><td>Practical hours</td><td>Independent Learning</td><td>Assessments</td><td>Total hrs</td></tr>
<tr><td>25 X 2 = 50 hrs</td><td>DS hrs = 4*3=12hrs</td><td></td><td>▪ (25 x 3)=75 hrs
▪ Online /Audio-visual materials and other learning resources(11hrs)</td><td>▪ Continuous Assessments (CA)(2 hrs)</td><td>150</td></tr>
<tr><td>Course Aim/s.</td><td colspan="5">To introduce the basic concepts of group theory, and methodology based on group theory as to understand Algebra</td></tr>
<tr><td>PLOs addressed by course</td><td colspan="5">PLO1: Knowledge: Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the degree.
PLO3: Communication: Demonstrate the competency in communicating efficiently and effectively to present information, ideas and concepts to the scientific community as well as to the wider society.
PLO5: Creativity and Problem Solving: Identify and analyze problems using quantitative and/or qualitative approaches using scientific methodology to provide valid conclusions.
PLO9: Lifelong Learning: Develop the capacity to foresee new trends and their impacts and continuously update knowledge and develop skills willingly to meet those future challenges.</td></tr>
<tr><td>Course Learning Outcomes (CLO)</td><td colspan="5">At the completion of this course student will be able to

CLO1: Verify group properties in particular examples(PLO1,3,5)
CLO2:Prove and apply Lagrange's theorem(PLO1,3,5)
CLO3:Recall and use the definitions and properties of dihedral, symmetric and alternating groups(PLO1,3,5)
CLO4: Understand and use the terms homomorphism and isomorphism(PLO1,3, 5)
CLO5: Derive the existence of groups of a specified small order(PLO1,3,5)
CLO6: Apply Sylow's Theorems to determine the structure of certain groups of small order (PLO1,3,5)
CLO7: Understand, use the properties of and manipulate permutations(PLO1,3,5)
CLO8: Understand and use the concept of conjugacy(PLO1,3,5)
CLO9: Prove and apply the basic theorems on group theory(PLO1,5)

CLO10: Understand and use the properties of group actions(PLO1,3,5,9)</td></tr>
<tr><td>Content (Main topics, sub topics)</td><td colspan="5">Binary operations, Introduction to groups, Elementary properties of groups, Subgroups, Finite groups, Dihedral groups & their properties, Symmetric & alternating groups, Cyclic groups & their properties, Abelian groups, Cosets, Lagrange'sTheorem, Introduction to direct product of two groups, Group Homomorphism, Group Isomorphism, Homomorphism Theorem & it's application, Semi-direct product Classification of finite groups of small order, Classification of finite Abelian groups Normal subgroups, Properties of normal subgroups, Normalizer & centralizer, Conjugate elements, Quotient groups, Group action</td></tr>
<tr><td>Teaching Learning methods (TL)</td><td colspan="5">Self-Learning/Independent learning of Self-study
▪ Instructional Material (IL)
▪ Online Activities (OL)
▪ Reference Work (RF)

Compulsory contact sessions
▪ Assessments (AS) and Feedback – MCQs (MCQ);Structured Essay (SEQ); Essay Questions (ES);

Non-compulsory contact sessions
▪ Day Schools (DS)</td></tr>
<tr><td rowspan="2">Assessment strategy</td><td colspan="3">Overall Continuous Assessment Mark (OCAM): 40...%</td><td colspan="2">Final Assessment: …60. %</td></tr>
<tr><td colspan="3">Details : Continuous Assessment1 (CAT1): -1hr
Continuous Assessment2 (CAT2): -1hr

OCAM=60%Maximum(CAT1, CAT2) +
40%Minimum(CAT1, CAT2)</td><td colspan="2">Final Evaluation : Theory: -100 % (2 hrs)</td></tr>
<tr><td>Recommended Readings:</td><td colspan="5">• Fraleigh, J.B. (2003). A First Course in Abstract Algebra (7th Edition). Pearson.
• Herstein, I.N. (1975). Topics in Algebra (2nd Edition). John Wiley & Sons, New York.</td></tr>
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	• Dummit D.S., Foote R.M. (2004). *Abstract Algebra (3rd Edition)*. John Wiley & Sons, New York. • Anderson M., Feil T. (2015). *A First Course in Abstract Algebra (3rd Edition)*. Taylor and Fransis Publishers.