



**Department of Mathematics**

**College of Science**

**Salahaddin University-Erbil**

**Subject: Axiomatic System**

**Course Book: Second Year – First Course**

**Lecturer's name: Imad A. Aziz**

**Academic Year: 2023-2024**

# Course Book

<b>1. Course name</b>	Axiomatic System
<b>2. Lecturer in charge</b>	Imad A. Aziz
<b>3. Department/ College</b>	Mathematics / Science
<b>4. Contact</b>	e-mail: imad.aziz@su.edu.krd Tel: +9647504639909
<b>5. Time (in hours) per week</b>	Theory: 3 Tutorial: 2
<b>6. Office hours</b>	
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	<p><b>23/6/2020</b> lecturer at Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq.</p> <p><b>16/6/2020</b> Awarded Ph.D. in Mathematics, Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq.</p> <p><b>3/9/2006</b> Assistant lecturer at Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq.</p> <p><b>31/7/2006</b> Awarded M.Sc. in Mathematics, Department of Mathematics, College of Science, University of Al-Mustansiriyah, Iraq.</p> <p><b>10/1/2002</b> Awarded B.Sc. in Mathematics, Department of Mathematics, College of Science, University of Salahaddin-Erbil, Iraq.</p> <p><b>1995-1996</b> Awarded Baccalaureate, Hamren Secondary</p>
<b>9. Keywords</b>	Axiom, Categorical, Euclidean, Triangle, Similar, Altitude, Centroid
<b>10. Course overview:</b>	<p>The development of geometry from the point of view of axiom systems. The course includes axiomatic systems, axiomatic systems for Euclidean geometry, geometry of triangles and geometry of quadrilaterals.</p>
<b>11. Course objective:</b>	<p>The objectives of the course are twofold: a) to introduce the student to the rich variety of geometric topics beyond those studied at the high school level. This should prove valuable to the mathematics student in broadening his horizons and specifically to the prospective high school teacher by increasing his knowledge in the area of geometry; and b) to help the student develop the skills of logical reasoning, use of the axiomatic method and careful presentation of proof. This course may help the student in the transition from the more manipulative courses at the freshman-sophomore level to abstract courses at the advanced level.</p>

<p><b>12. Student's obligation</b></p> <ol style="list-style-type: none"> <li>Students reign an commitment to come on time and remain in the classroom for the duration of scheduled classes and Labs.</li> <li>Nothingness speak students with each other during lecture.</li> <li>All devices must be turned off.</li> <li>When teacher ask question, Students will be to raise your hand before answer his question.</li> <li>Students own an obligation to write tests and final examinations at the times scheduled by the teacher or the College.</li> </ol>	
<p><b>13. Forms of teaching</b></p> <p>I give hard copy of My lecture notes to students before coming lecturer time. first I remember students about previous lecture, and then I start new lecture. At the end of the lecture give a homework for the next lecture. During this proses I am use presentation and whiteboard.</p>	
<p><b>14. Assessment scheme</b></p> <ol style="list-style-type: none"> <li><b>Practical:</b> 20% (Homework, Assignments and Quizzes).</li> <li><b>Theoretical:</b> 20% (Midterm exams).</li> <li><b>Final Exam: Practical:</b> 0% and <b>Theoretical:</b> 60% .</li> </ol>	
<p><b>15. Student learning outcome:</b></p> <ul style="list-style-type: none"> <li>recognize and communicate the distinction between axioms, definitions, and theorems, and describe how mathematical theories arise from them.</li> <li>construct logical arguments within the constraints of an axiomatic system.</li> <li>compare similarities and differences between Euclidean and non-Euclidean geometries.</li> <li>apply the properties of parallel lines to solve problems.</li> <li>interpret equivalence axioms and theorems in the triangles.</li> <li>interpret theorems of similarities related to triangle.</li> <li>recognize special lines in triangles like perpendicular bisector, angle bisector, medians, and altitude.</li> <li>recognize special points in triangles like centroid, circumcenter, incenter, and orthocenter.</li> <li>recognize the Euler line and nine-point circle.</li> </ul>	
<p><b>16. Course Reading List and References:</b></p> <ul style="list-style-type: none"> <li>Carl W. Lee, Axiomatic Systems, University of Kentucky, Revised Spring (2002)</li> <li>H.S.M.Coxeter and S.L.Greitzer, Geometry Revisited, New Mathematical Library 19, MAA (1967)</li> <li>Michael Hvidsten, Geometry with Geometry Explorer, McGraw Hill (2005)</li> <li>Dan Pedoe, Geometry - A Comprehensive Course, Dover (1988)</li> </ul>	
<p><b>17. The Topics:</b></p>	<p><b>Lecturer's name</b></p>

<p><b>1. Axiom Systems</b></p> <ul style="list-style-type: none"> <li>• Introduction to Axiom,</li> <li>• Euclid’s Axioms of Geometry,</li> <li>• Hilbert’s Axioms of Geometry,</li> <li>• Birkhoff’s Axioms of Geometry,</li> </ul> <p><b>2. Basic Results in Book I of the Elements</b></p> <ul style="list-style-type: none"> <li>• The first 28 propositions</li> <li>• Pasch’s axiom</li> </ul> <p><b>3. Triangles</b></p> <ul style="list-style-type: none"> <li>• Basic properties of triangles</li> <li>• Special points of a triangle</li> <li>• The nine-point circle</li> </ul> <p><b>4. Quadrilaterals</b></p> <ul style="list-style-type: none"> <li>• Basic properties</li> <li>• Ptolemy’s theorem</li> <li>• Area of a quadrilateral</li> <li>• Pedal triangles</li> </ul>	<p>This Column are not applicable because timetables of holidays will change that is I cannot Determine a week by week review of the topics.</p>
<p><b>18. Practical Topics (If there is any)</b></p>	
	<p>This Column are not applicable because timetables of holidays will change that is I cannot Determine a week by week review of the topics.</p>
<p><b>19. Examinations:</b></p> <p>Questions in the examination will be arranged the matching mode by way of the examples and exercises that I give delivered in the lecture notes. Sometimes will be have extra mark in examination for worthy students.</p>	
<p><b>20. Extra notes:</b></p> <p>Answers of examination will be find in the board’s declaration Mathematics department after every examination.</p>	
<p><b>21. Peer review</b></p>	