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جامعة الزيتونة الأردنية  
Al-Zaytoonah University of Jordan

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## **Course Syllabus**

**According to JORDAN National Qualification  
Framework (JNQF)**

**Course Name: Euclidean Geometry**

**Course Number: 0101231**

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### General Course Information:

|   |                                    |
|---|------------------------------------|
| Course Title  | Euclidean Geometry                 |
| Course Number                                       | 0101231                            |
| Credit Hours  | 3 credit hours                     |
| Education Type                                      | Traditional learning               |
| Prerequisites/Co-requisites                         | Foundations of Mathematics         |
| Academic Program                                    | Bachelor Program                   |
| Program Code  | 101                                |
| Faculty   | Faculty of Science and IT          |
| Department  | Mathematics                        |
| Level of Course                                     | 2                                  |
| Academic Year /Semester                             | 2023/2024 1 <sup>st</sup> Semester |
| Awarded Qualification                               | Bachelor                           |
| Other Department(s) Involved in Teaching the Course | -                                  |
| Language of Instruction                             | English                            |
| Date of Production                                  | 2021-2022                          |
| Date of Revision                                    | 16-10-2023                         |

### Course Coordinator:

|                               |  |
|-------------------------------|--|
| Coordinator's Name            |  |
| Office No.                    |  |
| Office Phone Extension Number |  |
| Office Hours                  |  |
| E-mail                        |  |

### Other Instructors:

|                               |  |
|-------------------------------|--|
| Instructor Name               |  |
| Office No.                    |  |
| Office Phone Extension Number |  |
| Office Hours                  |  |
| Email                         |  |

### Course Description (English/Arabic):

|                |  |
|----------------|--|
| <b>English</b> | In this course students the basic concepts of Euclidean geometry they study: Postulates, The congruent concept, Isosceles triangles, Equilateral triangles, Other cases of congruent triangles, The parallel concept, The Euclidean parallel postulate, Parallelograms, Quadrilaterals, Similarity concept, The basic similarity theorems, Pythagoras theorem, The area postulate, Area of polygons, Equivalence of polygons, Circles. |
| <b>Arabic</b>  | في هذا المساق يدرس الطلاب المفاهيم الأساسية للهندسة الإقليدية من خلال دراسة: المسلمات، مفهوم التطابق، مثلثات متساوية الأضلاع، مثلثات متساوية الساقين، حالات التطابق الأخرى للمثلثات، مفهوم التوازي، مسلمة التوازي، متوازي الأضلاع، الأشكال الرباعية الأخرى، مفهوم التشابه، نظريات تشابه المثلثات، نظرية فيثاغورس، مسلمة المساحة، مساحة المضلعات، تكافؤ المضلعات، مفاهيم أساسية في الدائرة.   |

**Textbook:** *Author(s), Title, Publisher, Edition, Year, Book website.*

Introduction to Geometry, Hassan Al-Zoubi, Dar Alam Al-Thaqafa 2014.

**References:** *Author(s), Title, Publisher, Edition, Year, Book website.*

- 1.- Elementary Geometry, Daniel C. Alexander, GERALYN M. KOEBERLEIN, Fifth Edition, Brooks/Cole 2013
- 2.- Foundations of Geometry, WYLIE, R. (2009), New York, Dover Publications, ISBN-10: 0486472140
- 3-Foundations of Geometry, -VENEMA, G. 2<sup>nd</sup> edition, UK, (2011), Pearson Education, ISBN-10: 0136020585.

### Course Educational Objectives (CEOs):

|             |  |
|-------------|--|
| <b>CEO1</b> | Develop a strong understanding of the fundamental principles and axioms of Euclidean geometry as presented in Euclid's "Elements." |
| <b>CEO2</b> | Learn to construct basic geometric figures using a straightedge and compass, including lines, angles, and polygons.                |
| <b>CEO3</b> | Understand the properties of basic geometric shapes, such as points, lines, angles, triangles, quadrilaterals, and circles.        |

### Intended Learning Outcomes (ILO's):

| Intended learning outcomes (ILOs) |   | Relationship to CEOs | Contribution to PLOs | Bloom Taxonomy Levels* | JNQF Descriptors** |
|-----------------------------------|---|----------------------|----------------------|------------------------|--------------------|
| <b>K</b>                          | Knowledge and Understanding   |                      |                      |                        |                    |
| <b>IL01-k</b>                     | Knowledge of the historical development of Euclidean geometry                         | CEO1                 | PLO1-k               | Understanding          | K                  |
| <b>IL02-k</b>                     | The student's awareness of the difference between a postulate, theory and definition  | CEO1                 | PLO1-k               | Understanding          | K                  |
| <b>IL03-k</b>                     | The student's knowledge of basic theorems in the various topics of Euclidean geometry | CEO3                 | PLO1-k               | Applying               | K                  |
| <b>S</b>                          | Intellectual skills   |                      |                      |                        |                    |
| <b>IL04-s</b>                     | Apply engineering models to solve various problems                                    | CEO2                 | PLO5-s               | Applying               | S                  |
| <b>C</b>                          | Subject specific skills   |                      |                      |                        |                    |
| <b>IL05-c</b>                     | Cooperate to work effectively in the group assignments.                               | CEO3                 | PLO11-c              | Applying               | C                  |
| <b>D</b>                          | Transferable skills:  |                      |                      |                        |                    |
| <b>IL06-d</b>                     |   |                      |                      |                        |                    |

**\*Bloom Taxonomy Levels:**

| Level #    | 1           | 2             | 3        | 4         | 5          | 6        |
|------------|-------------|---------------|----------|-----------|------------|----------|
| Level Name | Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |

**\*\* Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.**

**Program Learning Outcome (PLOs):**

| (PLOs) |  | JNQF Descriptors** |   |   |
|--------|--|--------------------|---|---|
|        |  | K                  | S | C |
| 1.     | Knowledge of the main concepts in pure mathematics.  | √                  |   |   |
| 2.     | Knowledge of the main concepts in applied mathematics.   | √                  |   |   |
| 3.     | Explain concepts, principles and theories in the fields of probability and statistics.         | √                  |   |   |
| 4.     | Possession of technological culture related to the fields of mathematics and its applications. | √                  |   |   |
| 5.     | Making use of mathematical logic in practical life.  | √                  |   |   |
| 6.     | Engaging scientific methodology as a way of thinking and as a tool in facing problems.         |                    | √ |   |
| 7.     | Applying mathematical software packages in problem solving.                                    |                    | √ |   |
| 8.     | Being capable of data analysis.  |                    | √ |   |
| 9.     | Capability of teaching according to modern educational techniques.                             |                    | √ |   |
| 10.    | Develop creative and innovative methods of teaching mathematics.                               |                    |   | √ |
| 11.    | Showing the ability to work under ethical and professional standards within teams.             |                    |   | √ |
| 12.    | Gaining critical thinking and scientific research skills.                                      |                    |   | √ |

\*\* Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)

**Weekly Schedule** (please choose the type of teaching)

- ☒ **Face to Face (F2F)**  
☐ **Hybrid** (One – To - One)  
☐ **Online**

**Schedule of Simultaneous and their Topics:**

| Week | First Lecture (F2F)  | Second Lecture (F2F)   | ILOs | PLOs | JNQF Descriptors * |
|------|--|--|------|------|--------------------|
| 1    | Distance postulate, Ruler postulate, Betweenness, line segmentsm Rays                  | Distance postulate, Ruler postulate, Betweenness, line segmentsm Rays                  | 1    | 1    | K                  |
| 2    | Line and plane in space, Angles, Triangles, Polygons                                   | Line and plane in space, Angles, Triangles, Polygons                                   | 2    | 5    | K                  |
| 3    | Congruence concepts, congruence postulate, Isosceles triangles, Equilateral triangles, | Congruence concepts, congruence postulate, Isosceles triangles, Equilateral triangles, | 4    | 8    | S                  |
| 4    | The theorem of exterior angle, inequalities of triangles                               | The theorem of exterior angle, inequalities of triangles                               | 2    | 1    | K                  |

|                    |   |   |   |    |   |
|--------------------|---|---|---|----|---|
| 5                  | Other cases of congruent triangles                            | Other cases of congruent triangles                            | 4 | 9  | S |
| 6                  | The parallel concept, The Euclidean parallel postulate        | The parallel concept, The Euclidean parallel postulate        | 4 | 8  | S |
| 7                  | Parallelograms  | Parallelograms  | 1 | 1  | K |
| Midterm Exam (30%) |   |   |   |    |   |
| 9                  | Quadrilaterals  | Back to triangles   | 2 | 7  | K |
| 10                 | Similar triangles and polygons, The basic similarity theorems | Similar triangles and polygons, The basic similarity theorems | 4 | 8  | S |
| 11                 | Similarity of right triangles, Pythagoras theorem             | Similarity of right triangles, Pythagoras theorem             | 4 | 9  | S |
| 12                 | The area postulate, Area and equivalent polygons,             | The area postulate, Area and equivalent polygons              | 4 | 9  | S |
| 13                 | Circles, Arcs of circles                                      | Circles, Arcs of circles                                      | 5 | 10 | C |
| 14                 | Tangents of a circle  | Four sides circular polygon, Intersecting of two circles      | 5 | 1  | C |
| 15                 | Projects Discussion   |   |   |    |   |
| 16                 | Final Exam  |   |   |    |   |

\* K: Knowledge, S: Skills, C: Competency

## Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Lecture.
- learning through projects.
- learning through problem solving.

## Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Discussion Forums, Quizzes) **20%**
- Midterm **30%**
- Final Exam **50%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

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**Required Equipment:**

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the ZUJ E-Learning Platform at <https://exams.zuj.edu.jo/>
- E-learning plan

**Assessment Tools Implemented in the Course:**

- Final Exam
- Midterm Exam
- Quizzes
- Homework

**Responsible Persons and their Signatures:**

|                               |                    |                |            |
|-------------------------------|--------------------|----------------|------------|
| Course Coordinator            | Waseem Almashaaleh | Completed Date | Oct / 2023 |
|                               |                    | Signature      |            |
| Received by (Department Head) |                    | Received Date  | / /        |
|                               |                    | Signature      |            |

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