A	Course Title & Number	**MTH 330 – Fundamental concepts of geometry**
B	Pre/Co-requisite(s)	MTH 111 or MTH 103
C	Number of credits	3
D	Faculty Name	Ayman Badawi
E	Term/ Year	Fall 2014

F	Sections					
		CRN	Course	Days	Time	Location
			MTH 330	UTR	12-12:50	NAB004

G	Instructor Information				
		Instructor	Office	Telephone	Email
		Ayman Badawi	NAB 262	2573	I prefer: abadawi@aus.edu

Office Hours:

UTR   2-3pm, other by APPOINTMENT

	Course Description	Describes elementary theory in foundations of geometry and logical systems and basic theory in the fields of Euclidean, non-Euclidean, and synthetic coordinate projective geometry. Topics include Ruler and Compass constructions, the golden ratio, Fibonacci numbers, Plane transformations, Fractals, Tiling, Hyperbolic Geometry, Inversion, Basic constructions in the Poincare Model, Ancient Greek geometry, Egyptians and the geometry of the pyramids, Basic geometric constructions,, symmetry and isometry, polygons.
I	Course Learning Outcomes	Upon completion of the course, students will be able to: 1. Demonstrate the ability to draw, design, construct and solve problems using Geometry 2. Relate Algebra to Art and Geometry (Golden ratio, Fibonacci sequence, symmetry groups and types) 3. Understand the mathematics behind tessellations (symmetry, regularity, uniformity) and use them in design (Escher, Voronoi) 4. Classify regular polygons that can be used in perfect tiling. 5. Understand many of the basic properties of triangles. 6. Use properties of triangles in construction. 7. Understand the concept of inversion. 8. Understand the concept and axiom of non-Euclidean geometry. 9. Understand and construct regular polygons in non-Euclidean (hyperbolic) geometry. 10. Understand the concept of distance in non-Euclidean geometry.
J	Textbook and other Instructional Material and Resources	Primary: Class Notes. *More quizzes and Exams on I-Learn and my personal webpage* *www.ayman-badawi.com* (click on courses teaching this semester)

K	Teaching, Learning Methodologies	
L	**Grading Scale, Grading Distribution, and Due Dates**	**Grading Scale** **Grading Distribution**

Assessment	Weight	Due Date
Projects and announced quizzes	15%	
Exam1	25%	**Monday, October 27, : 5:30-7**
Exam2	25%	**Monday, December 15 : 5:30-7**
Final	35%	
Total	100%	

Grading Scale

A	91-100
A-	88-90
B+	85-87
B	81-84
B-	78-80
C+	75-77
C	68-74
C-	60-67
D	50-59
F	0-49

M	Explanation of Assessments	Tests, Quizzes and Projects (Assignments.)
N	**Student Academic Integrity Code Statement**	Student must adhere to the Academic Integrity code stated in the 2013-2014 undergraduate catalog.

SCHEDULE

*Note: **Tests and other graded assignments due dates are set.** No addendum, make-up exams, or extra assignments to improve grades will be given.*

#	CHAPTER	NOTES
1	Lecture notes	• Introduction to the Course: lines in 2D. Basic triangles properties
2	Lecture notes	• The geometry of the triangle (centers, congruence and similarity)
3	Notes	• Ruler and compass constructions.
4	Notes	• Ruler and Compass constructions.

5	Notes	• The Fibonacci sequence. and the Golden ratio.
6	Notes	• The Fibonacci sequence. and the Golden ratio.
7	Notes (Plane transformations: composition, classification)	•
8	Notes	Plane transformations. Groups of symmetry (multiplication table)
9		
10	Notes	• Tiling (regular, semi-regular, Archimedean). Uniform tilings.
11	Notes	• Tiling (Voronoi, Escher), lattice.
12	Notes	• Tiling (Voronoi, Escher), lattice.
13	Notes	• Inversion
14	Notes	• Inversion and non-Euclidean geometry
15	Hyperbolic Geometry: Non-Euclidean Geometry	Non-Euclidean geometry
16	Reviews + Final	• **COMPREHENSIVE**