

Course Outline

Title: SPACE, SHAPE AND DESIGN (INTERMEDIATE LEVEL)

Code: MATHS2009

Formerly: MA659

Faculty / Portfolio: Faculty of Science

Program Level:

	AQF Level of Program					
	5	6	7	8	9	10
Level						
Introductory						
Intermediate			✓			
Advanced						

Pre-requisites: (Two mathematics courses or equivalent)

Co-requisites: Nil

Exclusions: (MA559 and MA659 and MATHS1009)

Progress Units: 15

ASCED Code: 010101

Learning Outcomes:

Knowledge:

- K1.** construct various 2-D and 3-D shapes;
- K2.** demonstrate and discuss geometric properties associated with congruence, symmetry;
- K3.** investigate geometric properties of two and three dimensional shapes;
- K4.** discuss Euclidean geometry and its applications;
- K5.** investigate and describe planar tessellations and topological ideas;
- K6.** construct simple mathematical proofs;
- K7.** use trigonometry to calculate angles and lengths of straight-sided figures;

Skills:

- S1.** explore man`s use of space, shape and design;
- S2.** illustrate the mathematical properties associated with aspects of space, shape and design;
- S3.** use and appreciate current technology to investigate and explore geometrical patterns and associated properties;
- S4.** solve real world problems though geometric modelling;
- S5.** use the proper language and symbols associated with the geometric concepts covered

Application of knowledge and skills:

- A1.** provide practical experiences with 2-D and 3-D construction;

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A2. provide practical examples of the use of trigonometry in spatial problems;

Values and Graduate Attributes:

Values:

- V1. appreciate the role of geometry and modelling in a technical civilisation.
- V2. appreciate the natural occurrence of shapes and patterns;
- V3. appreciate the aesthetics of fractals;

Graduate Attributes:

Attribute	Brief Description	Focus
Continuous Learning	This course will provide a greater understanding and appreciation of geometrical properties encountered in the real world.	Low
Self Reliance	Self reliance will be demonstrated through the completion of homework tasks and assessment.	Low
Engaged Citizenship		
Social Responsibility	Some of the assessment in this course will utilise group work in which students will demonstrate personal commitment and responsibility in working with their peers.	Low

Content:

Topics in this course may include an introduction to the concepts of Euclidean and elementary non-Euclidean geometry. Throughout the course, the ideas will be developed using practical applications and examples from nature, art, architecture and industry. Topics to be covered in this course will be taken from the following: 2-D and 3-D shapes, geometric properties, tessellations, scale, perspective, symmetry, topology, graph theory, fractals, kaleidoscopes, Golden Mean, and principles of trigonometry.

Assessment:

Learning Outcomes Assessed	Assessment Task	Assessment Type	Weighting
K1-K7; S1-S5; A1-A2	Participate in Class Activities	Portfolio of completed work	10 - 20%
K1-K7; S1-S5; A1-A2	Self Directed or Group Exploration	Projects	10 - 40%
K1-K7; S1-S5; A1-A2	Review and Skills Practice	Tests / Examination(s)	40 - 60%
K1-K7; S1-S5; A1-A2	Self Directed or Group Exploration	Presentations	0 - 20%

Adopted Reference Style:

APA

Presentation of Academic Work:

<https://federation.edu.au/students/assistance-support-and-services/academic-support/general-guide-for-the-presentation-of-academic-work>