Course Outline

Title: PUZZLES, PATTERNS AND PROOFS (ADVANCED LEVEL)

Code: MATHS3007

Formerly: MA757

Faculty / Portfolio: Faculty of Science and Technology

Pre-requisites: (At least one intermediate level mathematics course)

Co-requisites: Nil

Exclusions: (MA655 and MATHS2005)

Credit Points: 15

ASCED Code: 010101

Learning Outcomes:

Knowledge:

- **K1.** understand elementary ideas in number theory;
- **K2.** understand and be able to carry out proofs by mathematical induction
- **K3.** understand and construct simple mathematical proofs
- **K4.** appreciate the proof of the four colour theorem
- **K5.** understand the applicability of basic concepts of graph theory
- **K6.** understand arithmetic operations from a theoretical point of view

Skills:

- **S1.** express concepts, relationships and structures in mathematical form, and draw conclusions about the situations studied by abstract argument
- **S2.** use elementary ideas about sets and their properties in problem solving
- **S3.** investigate topological ideas
- **S4.** express in mathematical terms and solve a range of counting problems

Values and Graduate Attributes:

Values:

- **V1.** appreciate the role of imagination in mathematical discovery

Content:

This unit introduces a broad range of mathematical concepts of wide applicability. It contains material which will be of interest and relevant to computing students who seek a theoretical understanding of their subject, as well as to mathematics students. Much of the material is starting to appear in secondary mathematics curricula, and the rest provides valuable enrichment material for those students intending to teach mathematics.

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Assessment:

Assessment Task	Assessment Type	Weighting
Participate in class activities	Portfolio of completed work	0 - 20%
Self directed or group exploration	Projects / Presentation	30 - 50%
Review and skills practice	Tests / Examination(s)	50 - 60%

Adopted Reference Style:

APA

Presentation of Academic Work:

FedUni General Guide to Referencing