

SUBJECT DESCRIPTION FORM

Subject Title: Logic: Qualitative and Quantitative

Offering Departments: GEC and AMA

Subject Code: AMA105

Credit Value: 3

Pre-requisite: Nil

Learning Activities:

Lecture	28 hours
Tutorial	14 hours
	42 hours
Total	42 hours

This subject aims to develop students' ability in logical and analytical thinking through the qualitative and quantitative aspects of logic. Introduction to the key concepts and relationships of formal logic will be done primarily through lectures. Examples and case studies will be presented in small group tutorials. Finally, self-study will be encouraged through student accessible computer-based exercises. Assessment will be in the form of both in-class mid-term tests as well as group projects associated with tutorials.

The first part will emphasize qualitative logic and will be taught by the General Education Centre. The second part will emphasize quantitative logic. Some topics from discrete mathematics will be presented as illustrations of the general theory. This part will be taught by the Department of Applied Mathematics.

Assessment:

Continuous Assessment	40%
Examination	60%
	100%
Total	100%

To pass this subject, students are required to obtain Grade D or above in **both** the Continuous Assessment and the Examination components.

Learning Outcomes:

On completion of this subject, students are expected to be able to demonstrate some ability with respect to the following skills:

- (i) demonstrate basic logical reasoning
- (ii) see the relationship between formal logic and natural language
- (iii) apply logical reasoning in both everyday and academic situations

- (iv) recognize and refute common logical fallacies
 - (v) appreciate the axiomatic approach in mathematics
 - (vi) understand why proofs of mathematical statements work
 - (vii) apply logical reasoning in problem solving.
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Syllabus:

Qualitative Logic: Introduction_What is Logic? Logic Puzzles. Some Basic Concepts and Logical Relations. Propositional Logic. Syllogistic Logic. Inductive Reasoning. Some Common Informal Fallacies.

Quantitative Logic: Sets and propositions; Permutations and combinations; Relations and Functions; Graphs and Trees; Natural Numbers.

Suggested reference:

Gensler, Harry.	Introduction to Logic	Routledge, New York 2002
Fisher, Alec	Critical Thinking	OUP, Cambridge 2001
Copi, I.M., Cohen C.	Introduction to Logic, 10 th edition	Macmillan, New York 1998
Johnson, D.L.	Elements of Logic via Numbers and Sets	Springer 1998
Hurley, Patrick J.	A Concise Introduction to Logic	Wadsworth Publishing Co. Belmont, 1988
Guttenplan, Samuel	The Languages of Logic: An introduction to formal logic	Basil Blackwell, Oxford 1986
Salmon, W.C.	Logic, 3 rd edition	Prentice-Hall, Englewood Cliffs 1984
Hodges, Wilfred	Logic	Harmondsworth 1977
Liu, C.L.	Elements of Discrete Mathematics	McGraw Hill, 1985
Cupillari A.	The nuts and bolts of proofs	Academic Press 2001