

## COURSE OUTLINE: MH4921

Course Title	<b>Supervised Independent Study II</b>		
Course Code	<b>MH4921</b>		
Offered	Study Year 4, Sem 1   Study Year 4, Sem 2		
Course Coordinators	Ku Cheng Yeaw (Dr)	cyku@ntu.edu.sg	6513 8652
	Ng Keng Meng (Assoc Prof)	kmng@ntu.edu.sg	6513 8656
Pre-requisites	MH4920 or Approval by Division of Mathematical Sciences		
AU	4		
Contact hours	Lectures: 25		
Approved for delivery from	AY 2020/21 semester 1		
Last revised	19 Aug 2020, 09:24		

### Course Aims

This course is for students who have already completed a first Independent Study module, and is looking either to continue with the materials of the first Independent Study course, or on a different topic.

The Independent Study course aims to provide opportunities for you to explore a topic of interest that is not necessarily covered in the usual academic curriculum. You and the supervisor must agree upon a study proposal that clearly states the course objectives, topics to be covered, schedule of meetups, and the breakdown of different mode of assessments.

### Intended Learning Outcomes

Upon successfully completing this course, you should be able to:

1. Independently process and interpret concepts and methodologies related to a topic of interest.
2. Critically assess the applicability of mathematical tools in the relevant areas.
3. Critically assess the validity of a mathematical argument involving concepts from the course content.
4. Present (in writing and speaking) mathematical ideas logically and coherently at the appropriate level for the intended audience.
5. Communicate (in writing and speaking) effectively with supervisor to resolve issues related to the course organisation and content.

### Course Content

Materials in a selected topic of interest, achieved through independent study.

## Assessment

Component	Course ILOs tested	SPMS-MAS Graduate Attributes tested	Weighting	Team / Individual	Assessment Rubrics
<b>Continuous Assessment</b>					
<b>Mid-semester Quiz</b>					
Assignments and presentations. Must weigh at most 50%	1, 2, 3, 4, 5	1. a, b, c 2. a, b, c, d 3. a 4. a 5. a	50	individual	See Appendix for rubric
Summative Assessment. At least 2 types weighing at least 50%	1, 2, 3, 4, 5	1. a, b, c 2. a, b, c, d 3. a 4. a 5. a	50	individual	See Appendix for rubric
<b>Total</b>			<b>100%</b>		

These are the relevant SPMS-MAS Graduate Attributes.

### 1. Competence

- a. Independently process and interpret mathematical theories and methodologies, and apply them to solve problems
- b. Formulate mathematical statements precisely using rigorous mathematical language
- c. Discover patterns by abstraction from examples

### 2. Creativity

- a. Critically assess the applicability of mathematical tools in the workplace
- b. Build on the connection between subfields of mathematics to tackle new problems
- c. Develop new applications of existing techniques
- d. Critically analyse data from a multitude of sources

### 3. Communication

- a. Present mathematics ideas logically and coherently at the appropriate level for the intended audience

### 4. Civic-mindedness

- a. Develop and communicate mathematical ideas and concepts relevant in everyday life for the benefits of society

### 5. Character

- a. Act in socially responsible and ethical ways in line with the societal expectations of a mathematics professional, particularly in relation to analysis of data, computer security, numerical computations and algorithms

## Formative Feedback

Component 1: Formative feedback is given through discussion within weekly meetups, and comments on solutions submitted for the assignment problems/ongoing presentations.

Component 2: Feedback is given after the summative assessment is marked on the common mistakes and level of difficulty, and techniques used to solve the problems, quality of written report/oral presentation.

## Learning and Teaching Approach

<b>Lectures</b> (25 hours)	The course will be conducted in a professional setting. You will undertake reading and working on problems, where you learn to be responsible, independent, self-disciplined and self-motivated. You will also attend a weekly face-to-face discussion session with your supervisor for more in-depth discussion and problem solving/ongoing presentations.
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## Reading and References

Reading materials are dependent on the selected field of study and specific to each project. Faculty Supervisor will recommend reading materials, and you will conduct a comprehensive literature review as well.

## Course Policies and Student Responsibilities

The MAS Faculty Supervisor will be the key person working with and interacting with you on a regular basis. You are expected to take the initiative to approach your supervisor for discussion, and to resolve issues when you encounter difficulties.

## Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [Academic Integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

## Course Instructors

Instructor	Office Location	Phone	Email
Ku Cheng Yeaw (Dr)	MAS-05-11	6513 8652	cyku@ntu.edu.sg
Ng Keng Meng (Assoc Prof)	MAS-05-09	6513 8656	kmng@ntu.edu.sg

## Planned Schedule

Topic	Course ILO	Readings/ Activities
Materials in a selected topic of interest, achieved through independent study.	1, 2, 3, 4, 5	

## Appendix 1: Assessment Rubrics

### Rubric for Mid-semester Quiz: Assignments and presentations. Must weigh at most 50% (50%)

For continuous assessments, the format can be either take-home assignments, weekly presentations, or any kind of repeated scheduled assessments. The total weightage of all continuous assessments is at most 50%

### Rubric for Mid-semester Quiz: Summative Assessment. At least 2 types weighing at

## least 50% (50%)

For summative assessments, the format can be tests, quizzes, a final presentation, term papers, a final report, project work, or any other form of summative assessment. There must be at least two different types and the total weightage must be at least 50%. The detailed assessment rubrics for the final presentation and project are given below:

### Assessment Rubrics for Final Presentation & Oral Exam

Category	Scoring Criteria
<b>Organization (25%)</b>	Did the student describe the background behind the topic?
	Was information organized in a logical and systematic manner?
	Did the student lay out the objectives well, and establish a framework for the rest of the presentation?
	Are technical terms well-defined in language appropriate for the target audience?
	Did the student concluded appropriately?
	Good time management?
<b>Visual and Oral Presentation (25%)</b>	Are the slides/presentation on the board informative?
	Are the slides/presentation too cluttered or too sparse, well prepared and not distracting?
	Clear and audible voice?
	Speaker maintains good eye contact with the audience and is appropriately animated (e.g., gestures, moving around, etc.).
<b>Q &amp; A (50%)</b>	Did the student understand the questions, and answer to the point?
	Was the student confident in his/her answer?

### Assessment Rubrics for Final Term Paper/Report/Project

Category	Scoring Criteria
<b>Organization (40%)</b>	Materials are organized and presented in a clear, coherent and logical sequence.
	Correct use of referencing throughout, formatted in the correct scientific specification.
<b>Content (60%)</b>	Clear description of objectives, motivations, interpretation and explanation of approaches and sequence of topics
	Technical terms are well-defined in language appropriate for the area.
	Material included is accurate and relevant to the overall message/purpose.
	Contribute to the overall exposition in own ways.
	Discussion and explanations are thorough and tie well with the objective of the independent study.
	Proofs and computations/codes are included when they are relevant
	Shows clear understanding of key concepts/theories, with relevant examples to illustrate ideas
Shows careful reading and evaluation of sources.	