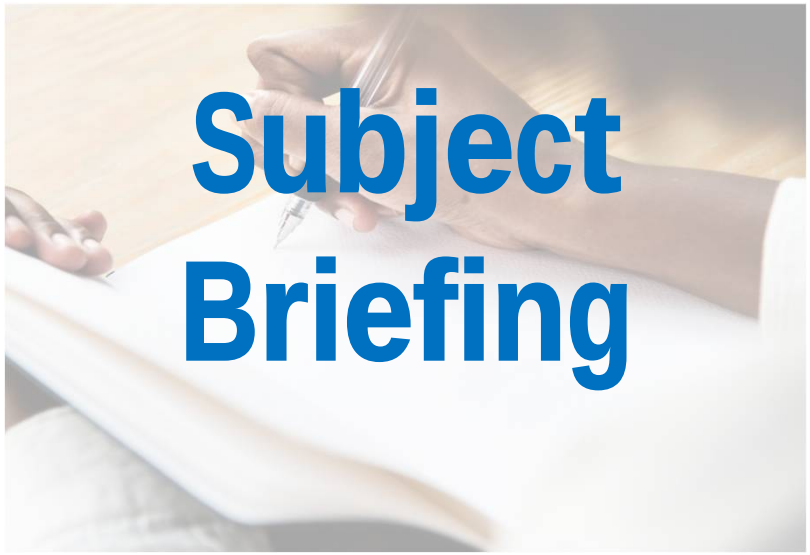
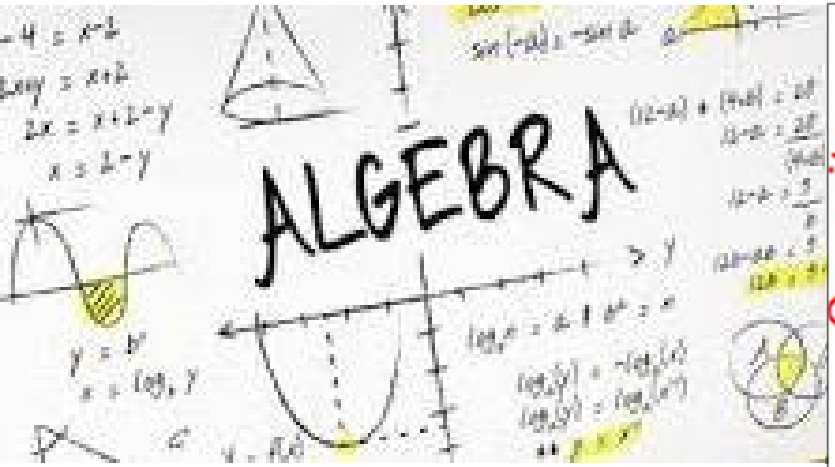
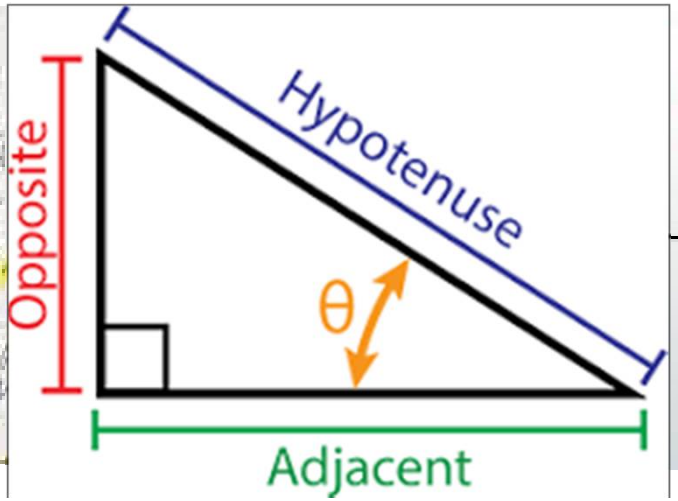
MA1020

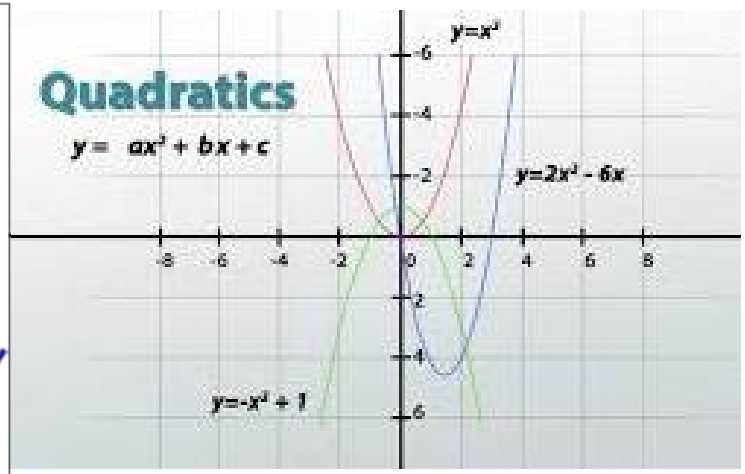
Lim Sim Guan 林心源
sim.lim@jcu.edu.au
9772 1528



MA1020 Preparatory Mathematics

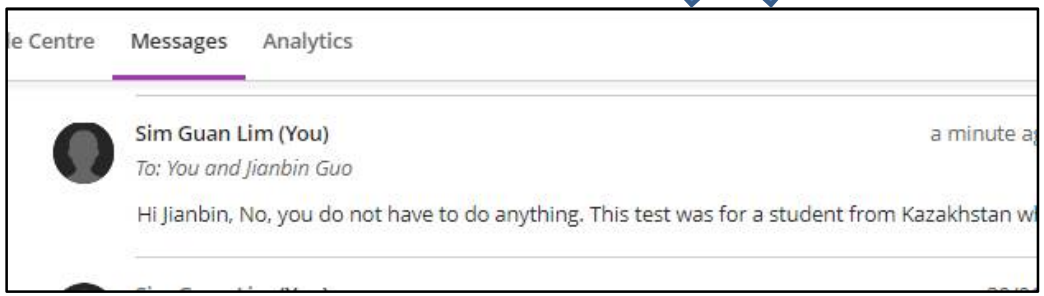






Communicate using jcu email

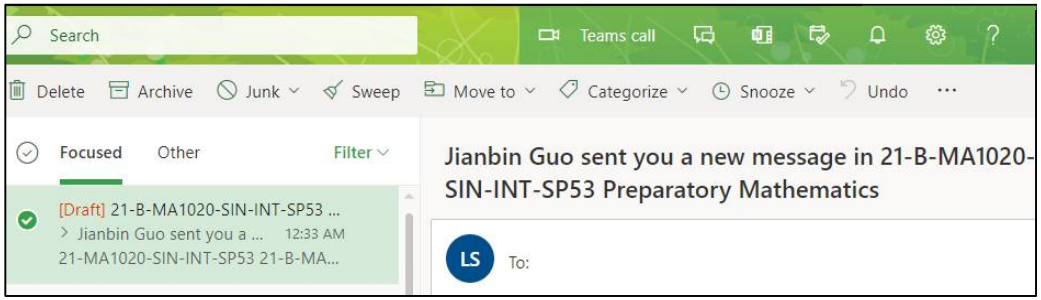
LearnJCU Messages ✗



- Must respond from Messages
- Will not know until notified, mostly the next morning
- Slow, restrictive,....

Lecturer uses Messages as students email addresses are not known to him

Email: sim.lim@jcu.edu.au ✓



- Respond from any devices
- Knows immediately.
- Faster, more flexible (eg attachments,..)

- Students please use email to reach lecturer, using sim.lim@jcu.edu.au. Includes all later communications.

Lecture LA1 – Agenda

MA1020 Preparatory Mathematics

1. Subject Briefing:
   - Key Subject Information
     - Including, Assessment Information
   - Practice³ & Delivery mode
2. Lecture Proper…..

Next lectures (LA2) about Assessments:

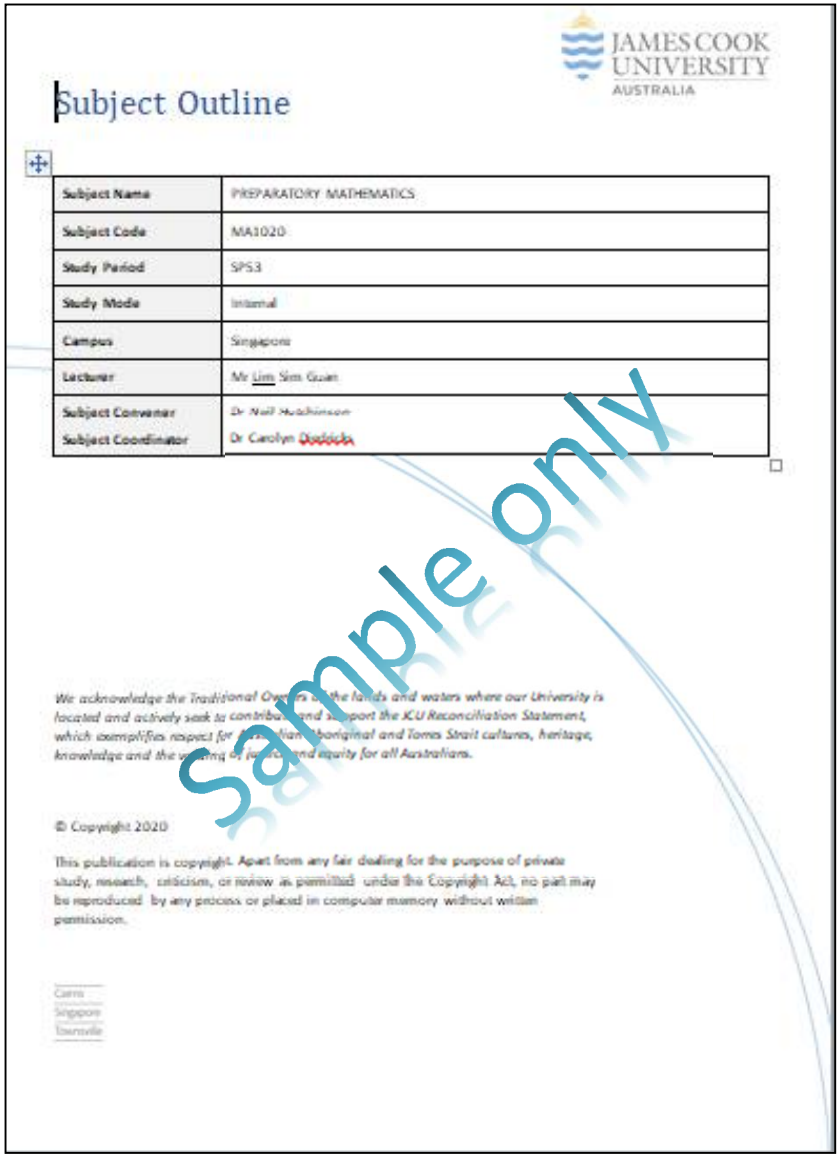
- Guide to writing marks-friendly answers

Key Subject Information

1. Subject Outline
2. Lecture Notes & Lecture Recordings
3. LearnJCU MA1020 site info

Key Subject Info
1. Subject Outline

Let's look at some details.
Leave assessment info for later



JAMES COOK UNIVERSITY
AUSTRALIA

Subject Outline

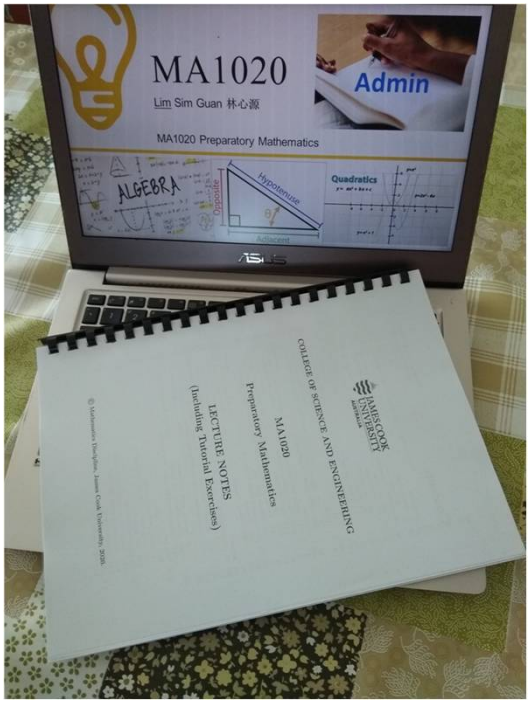
Subject Name	PREPARATORY MATHEMATICS
Subject Code	MA1020
Study Period	SPS3
Study Mode	Internal
Campus	Singapore
Lecturer	Mr Lim Sim Guan
Subject Convenor Subject Coordinator	Dr Neil Hutchinson Dr Carolyn Dedicka

Sample only

We acknowledge the Traditional Owners of the lands and waters where our University is located and actively seek to contribute and support the JCU Reconciliation Statement, which exemplifies respect for Australian Aboriginal and Torres Strait cultures, heritage, knowledge and the fostering of justice and equity for all Australians.

Cairns
Singapore
Townsville

Key Subject Info
2. Lecture Notes & Recordings



Our
Lecture Notes
aka
Textbook

JAMES COOK UNIVERSITY
AUSTRALIA

COLLEGE OF SCIENCE AND ENGINEERING

MA1020

Preparatory Mathematics

LECTURE NOTES
(Including Tutorial Exercises)

Print it out and write your own notes during lectures, workshop, tutorial,....

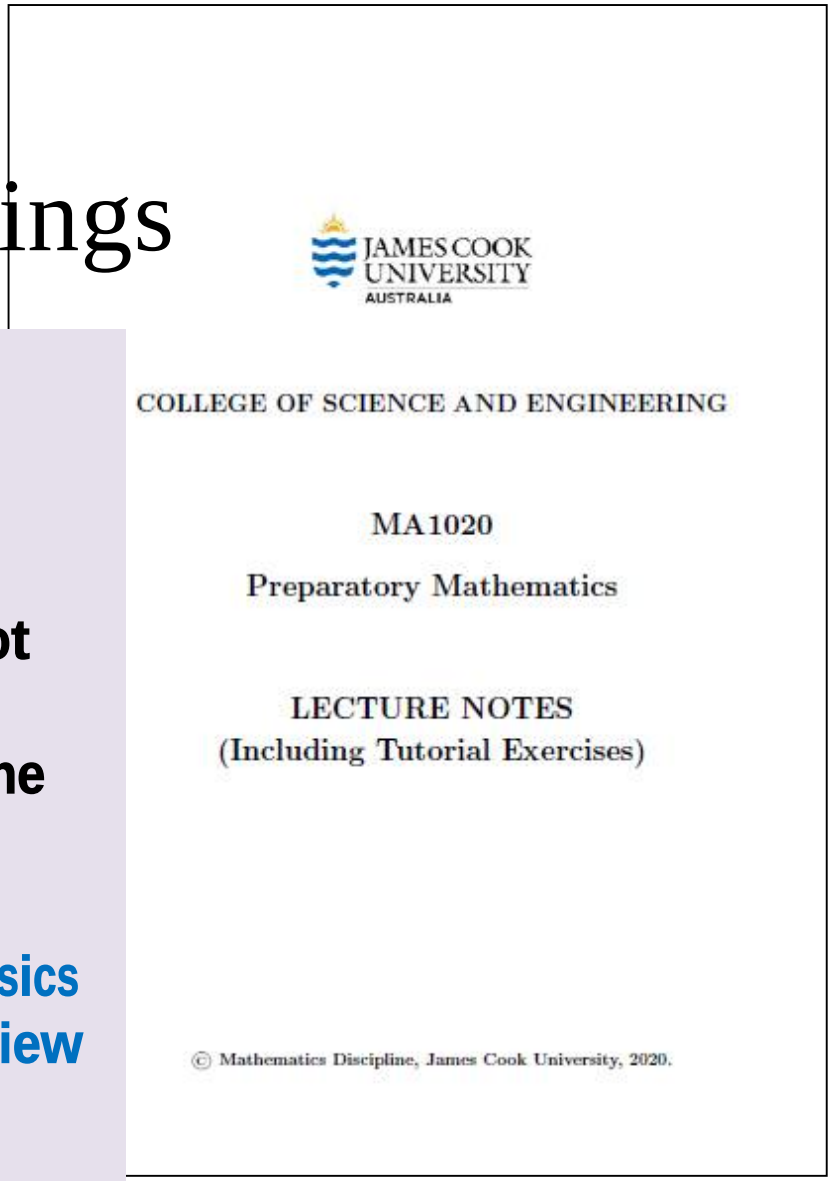
Key Subject Info
2. Lecture Notes & Recordings

Expectations on students:

Before attending class (on the topic)

1. **Review the Lecture Notes**
2. **Review the Lecture Recordings esp if you cannot understand any part of the lecture notes. The content in the Lecture Notes are explained in the Lecture Recording comprehensively.**

JCUS Lectures proceeds on the assumption that basics are understood. Lectures will consist of a quick review followed by answering exercise questions



JAMES COOK UNIVERSITY
AUSTRALIA

COLLEGE OF SCIENCE AND ENGINEERING

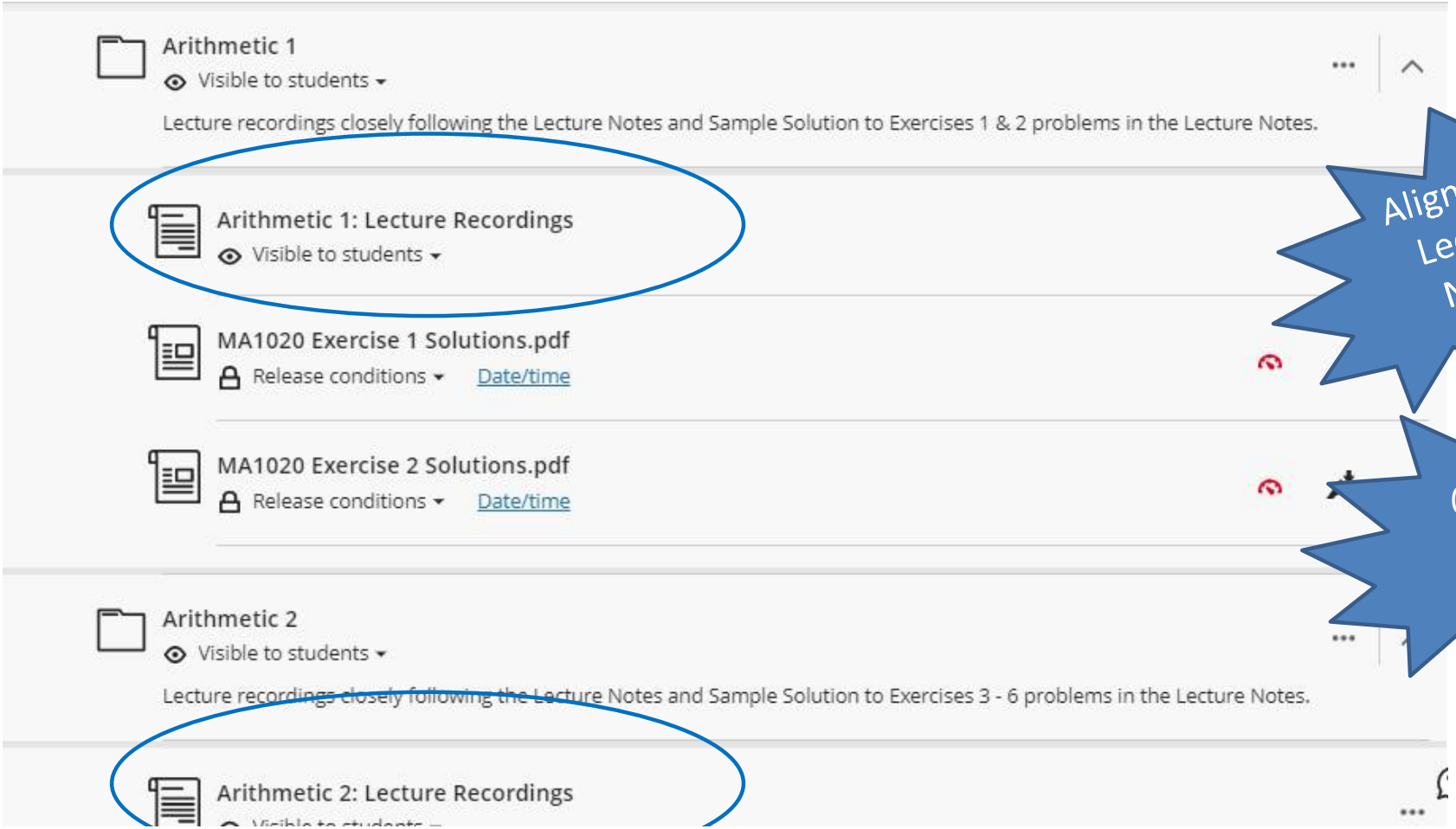
MA1020

Preparatory Mathematics

LECTURE NOTES
(Including Tutorial Exercises)

Key Subject Info

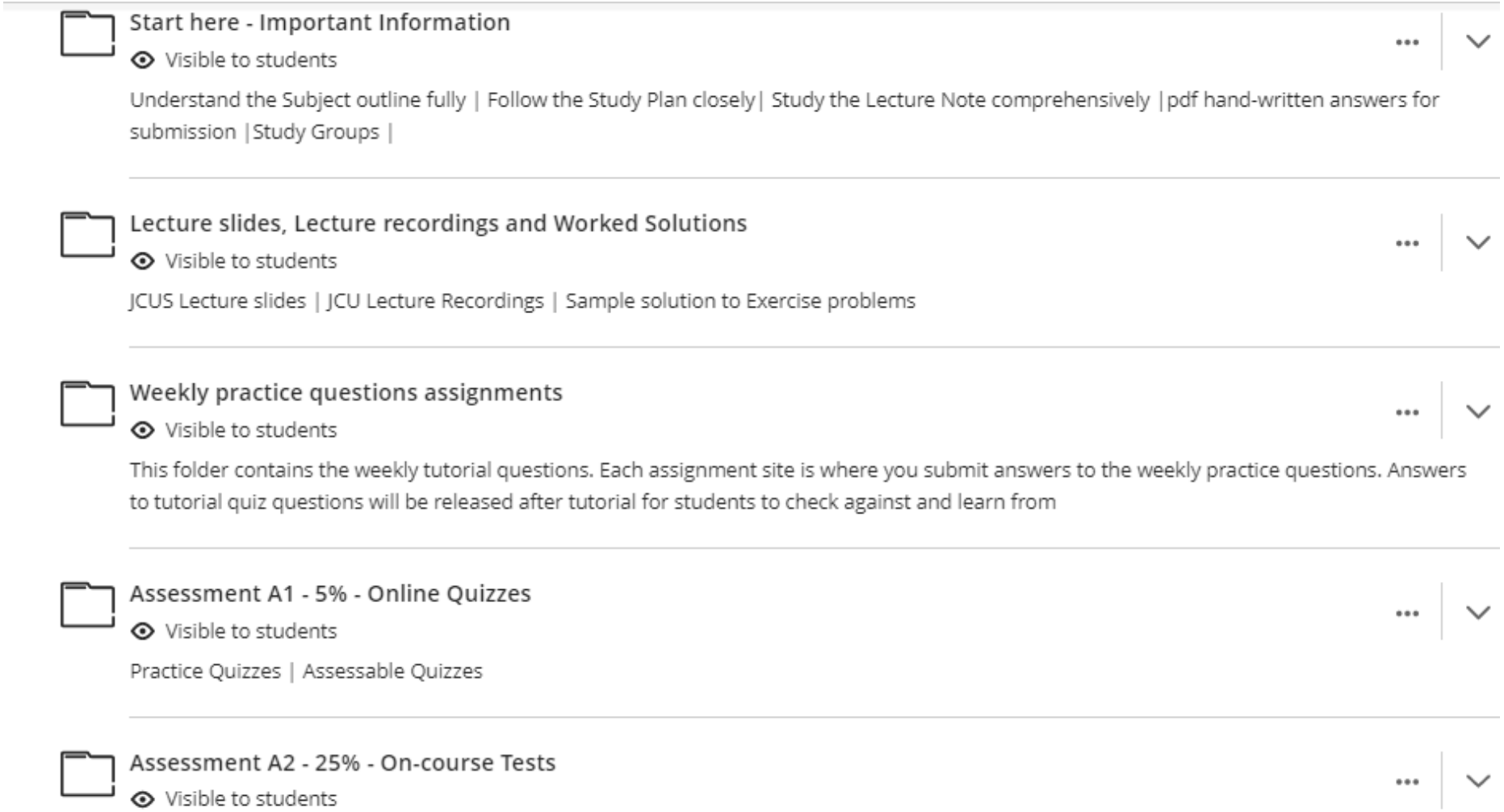
2. Lecture Notes & Recordings



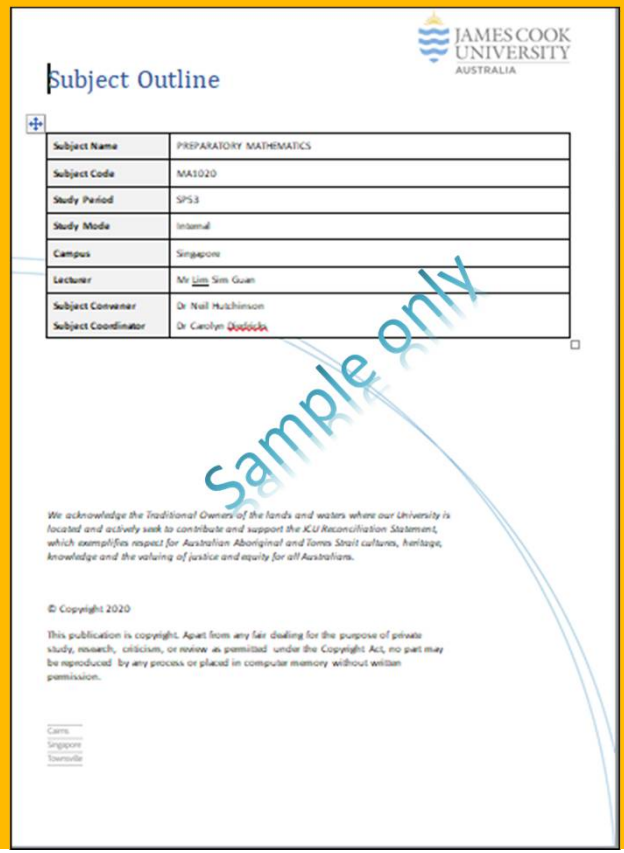
Aligned to Lecture Notes

Compre-hensive

Key Subject Info - 3. LearnJCU materials



Assessments Information



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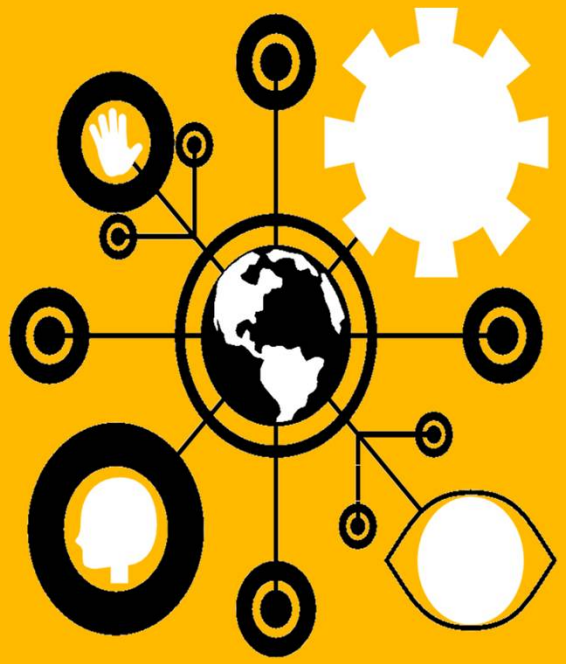
Cairns
Singapore
Townsville

Learning Outcomes



Students who successfully complete this subject will be able to:

SLO1: demonstrate fundamental mathematical skills for application to quantitatively-based University level subjects;
SLO2: solve introductory mathematical problems using techniques of arithmetic, algebra, functions and graphs, trigonometry and differential calculus;
SLO3: apply standard mathematical laws, definitions and procedures involving: precedence, expansion and factorisation, indices, exponentials and logarithms, trigonometry and differentiation;
SLO4: manipulate and solve equations and formulae including: linear, quadratic, cubic and simultaneous equations;
SLO5: graph (draw) linear, quadratic, cubic and standard trigonometric functions.

Understanding weighted average

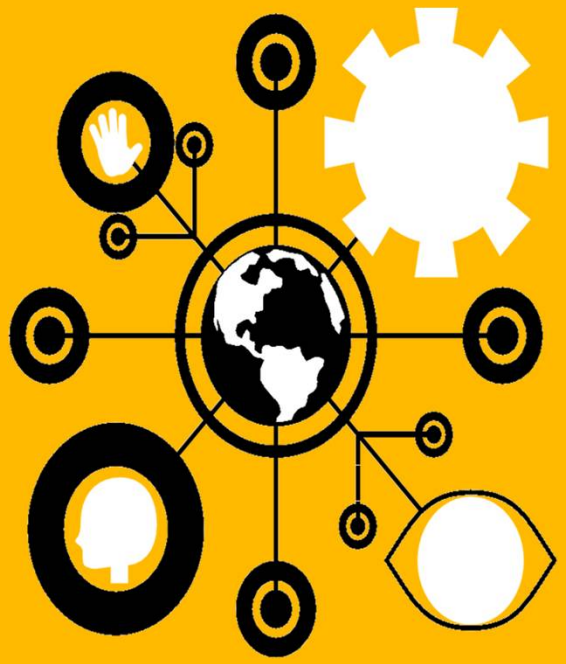
A1 (5%)	A2 Test 1 (5%)	A2 Test 2 (15%)	A2 Test 3 (15%)	A3 Exam (60%)	Total
100	80	60	40	60	Base: 100
100/100		50/100		60/100	
A	B	C	D	E	G
?/5		?/15		?/100	

Calculate the weighted value for A, B, C, D, E and G

Understanding weighted average

A1 (5%)	A2 Test 1 (5%)	A2 Test 2 (15%)	A2 Test 3 (15%)	A3 Exam (60%)	Total
100	80	60	40	60	Base: 100
A	B	C	D	E	G
5	4	9	6	36	60

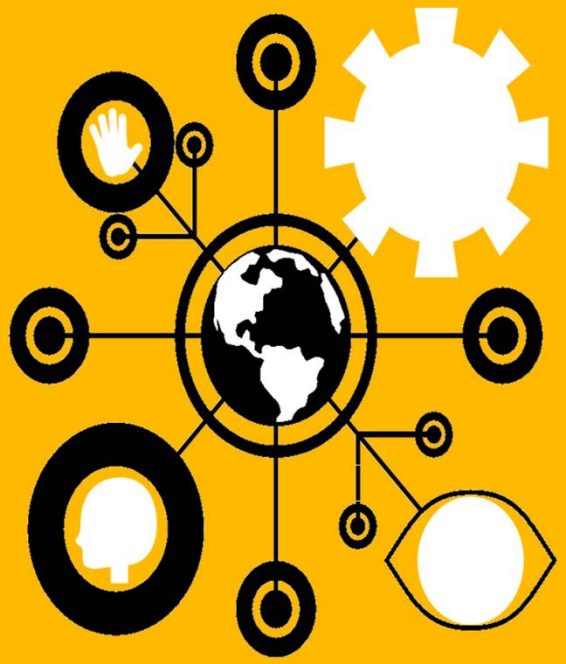
Requirements for successful completion of subject



In order to pass this subject, you must satisfy ALL items below:

1. Attempt all assessment items.
2. Gain an overall percentage of 50% or higher, calculated from all assessment items.
3. Gain an overall percentage of 40% or higher in Exam – meaning: must get 40/100 marks for Exam
4. Gain an overall percentage of 40% or higher in invigilated assessments (on-course tests and exam) – meaning: must get 40/100 marks weighted total of 3 on-course tests and Exam
5. Demonstrate a satisfactory level of participation in tutorial (practice questions and share answers in study group and class; ready answer when asked. It is not about performance in class, but working out solutions to allocated questions in Workbook)

Requirements for successful completion of subject



In order to pass this subject, you must satisfy ALL items below:

Assessments	1st hurdle	2nd hurdle	Final hurdle
A1 (5%) **Assessment task 1: Online Quizzes**	Attempt assessment	-	≥ 50% (Weighted total of A1, A2 & A3)
A2 (35%) **Assessment task 2: On-Course Tests**	Attempt assessment	≥ 40% (Weight total of A3, & *Weight total of A2 & A3*)	
A3 (60%) **Assessment task 3: Final Exam**	Attempt assessment		

- Plus, demonstrate a satisfactory level of participation in tutorials and workshops – evidences from worked solutions in Workbook

All MA1020 assessments are closed book, individual assessments. 95% are on-site invigilated mode.

MA1020 Assessments

Students	A1 - A3 raw score based upon 100 marks	A1 Online Quizzes (5%)	A2 On-course Tests (35%)	A3 Final Exam (60%)	Weighted A3 (100%)	Weighted A2+A3 (100%)	Weighted Total (100%)	Fail / Pass
A	Raw		60	70				
	Weighted	-	21	42	70	66.32	63.00	Fail
B	Raw	100		90				
	Weighted	5	-	54.00	90	62.11	59.00	Fail
C	Raw	100	40	40				
	Weighted	5	14.00	24.00	40	40.00	43.00	Fail
D	Raw	100	60	40				
	Weighted	5	21.00	24.00	40	47.37	50.00	Pass
E	Raw	100	40	52				
	Weighted	5	14.00	31.20	52	47.58	50.20	Pass
F	Raw	1	1	83				
	Weighted	0.05	0.35	49.80	83	52.79	50.20	Pass
G	Raw	100	80	90				
	Weighted	5	28.00	54.00	90	86.32	87.00	HD?

All assessments are opened once only

- All MA1020 assessments – Assessable Quizzes (6), On-course Tests (3) and Exam (1) – will only be opened once.
- Student who miss any assessment because he/she does not know, is late, ... will not be granted a deferred assessment.
- Granting of deferred tests (by lecturer) and exam (by Exams Office) are based upon advance, valid and approved reason

https://www.jcu.edu.au/students/assessment-and-results/special-consideration/extenuating-circumstances-supporting-documentation

Refer to Assessments dates, format, etc within Subject Outline (expanded)

www.bit.ly/1020Survey

About you & your Maths proficiency

<5 min to complete

Lecture LA1 – Agenda

MA1020 Preparatory Mathematics

1. Subject Briefing:
   - Key Subject Information
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2. Lecture Proper…..

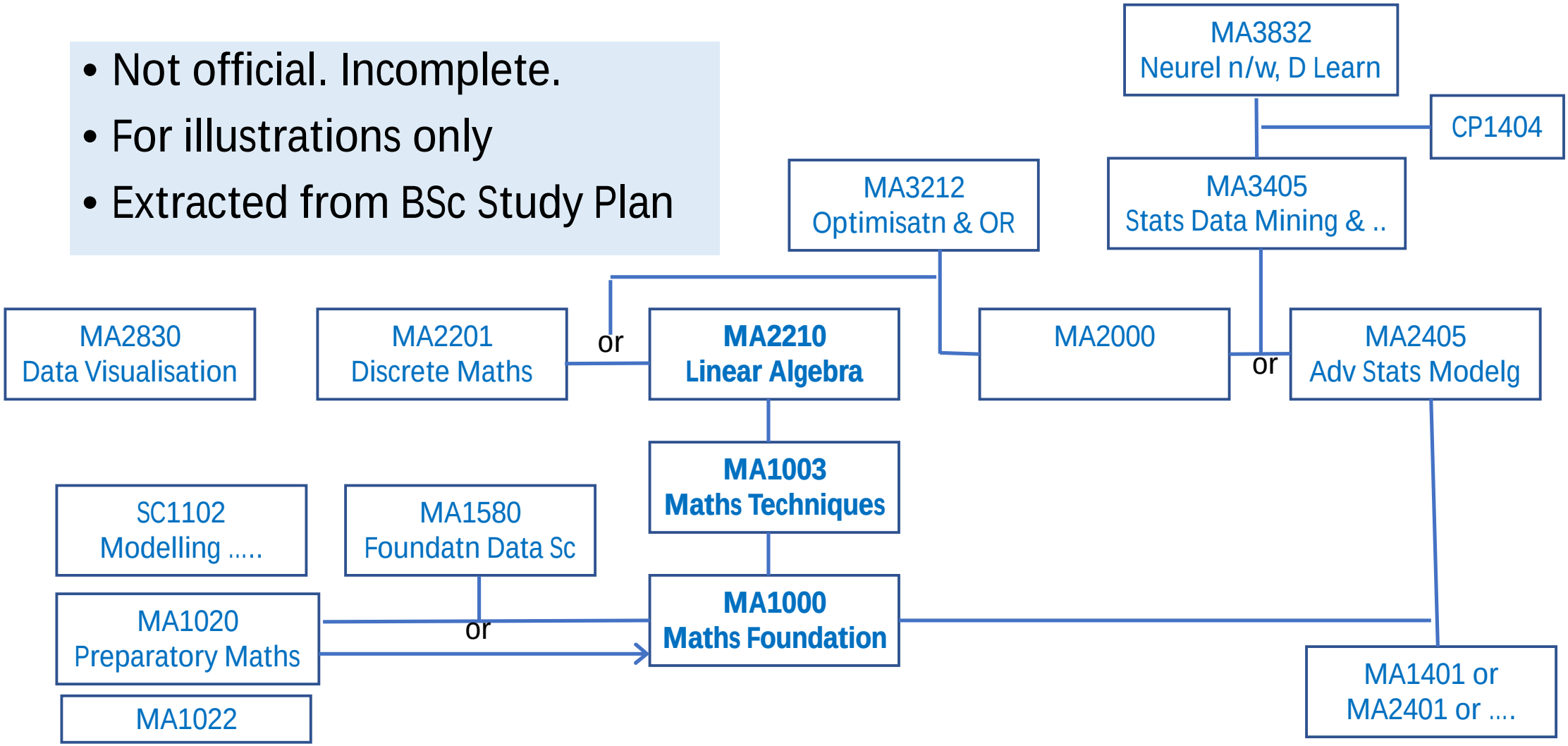
Next lectures (LA2) about Assessments:

- Guide to writing marks-friendly answers

The nature of mathematics is such that we will always build on the previous level

The nature of mathematics is such that we will always build on the previous level

- Not official. Incomplete.
- For illustrations only
- Extracted from BSc Study Plan



Sketch cubic function $ax^3 + bx^2 + cx + d$

Orientation — *Knowledge About change*

y-intercept — *Graphs Range*

x-intercept — *Factorisation Quadratic Eq^n*

Turning points — *1st order Differentiation*

Concavity — *2nd order Differentiation*

Functions & Graphs.
$y = mx + c$. $y = ax^2 + bx + c$. Simultaneous Eq^n

Trigonometry.

Differential Calculus.
Gradient. Rules of Differentiation. App^n

Algebra – involves variables eg x, y. Like vs unlike terms.
Index Laws. Exponents & Logarithms. Expanding & Factorising. Discriminant. Solving Quadratic Equations. Formulae.

Arithmetics - E.g. Distributive Law $2(x - y) = 2x - 2y$. LCM, HCF. Fraction. Precedence Rule. Power/Exponent. Log. Etc

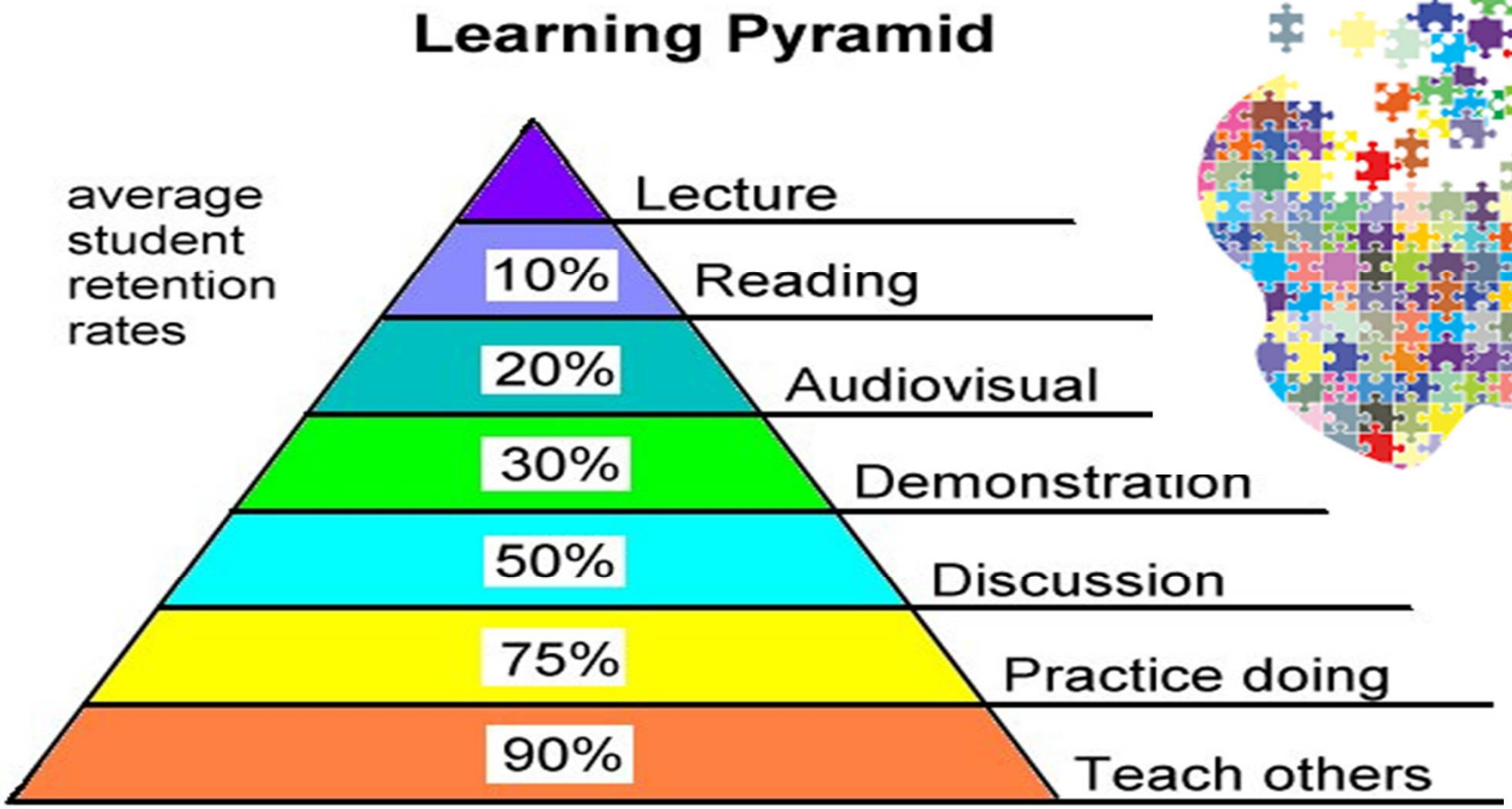
Practise^3 - Practise, Practise, Practise, ……

	Type of exercises/practices	Answers	Release time
A	Exercises (1 to 34) in the Lecture Notes – practice during LA, WA & on your own	1. Pages 119 to 124 of Lecture Notes (answers to selected but most questions)	
		2. Step-by-step solutions on LearnJCU	Available all the time, On LearnJCU
B	Tutorial Practice Questions on LearnJCU – during Tutorial & practice on your own	Step-by-step answers on LearnJCU	Available all the time, On LearnJCU
C	Practice online quizzes (A2) on LearnJCU – practice on your own	Immediate response as you answer the (10) questions	

Average student retention rates

PASSIVE

ACTIVE



Source: National Training Laboratories, Bethel, Maine

Traditional lecture-tutorial system

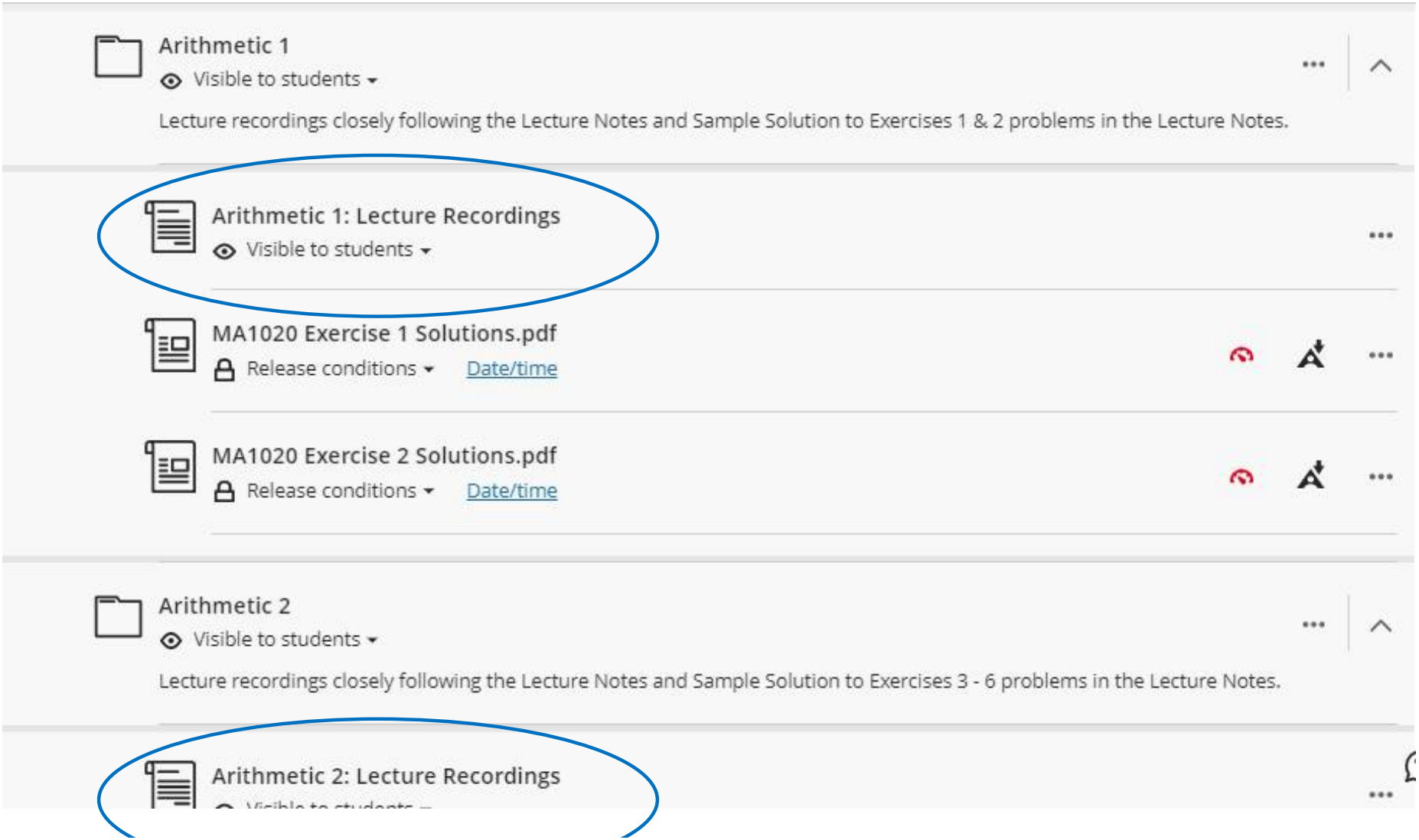
Lecture → Homework (Practices) → Tutorial (more practices)

The lecture recordings is an example of traditional lecture

130 hours workload expected
10 to 13 hours/week workload

4 hours/week lecture & workshop
1 hour/week tutorial
5 – 8 hours/week self study

Comprehensive lecture recordings available



Delivery & Learning modes

Traditional lectures (one-way) → ……→Flip Classroom (2-way) →……→ Self-paced learning → ……

Flip Classroom

- Sage → Facilitator
- Before class: Pre-learn topics
- In class: Q&A, discussion, work on problems, provide focus, help deepen understanding. It is "flipped" or "2-way"
- After class: same as traditional – review, self assessment, do assignments
- Most suitable for scaffolded topics, complex/abstract topics, such as Maths

Self-paced learning

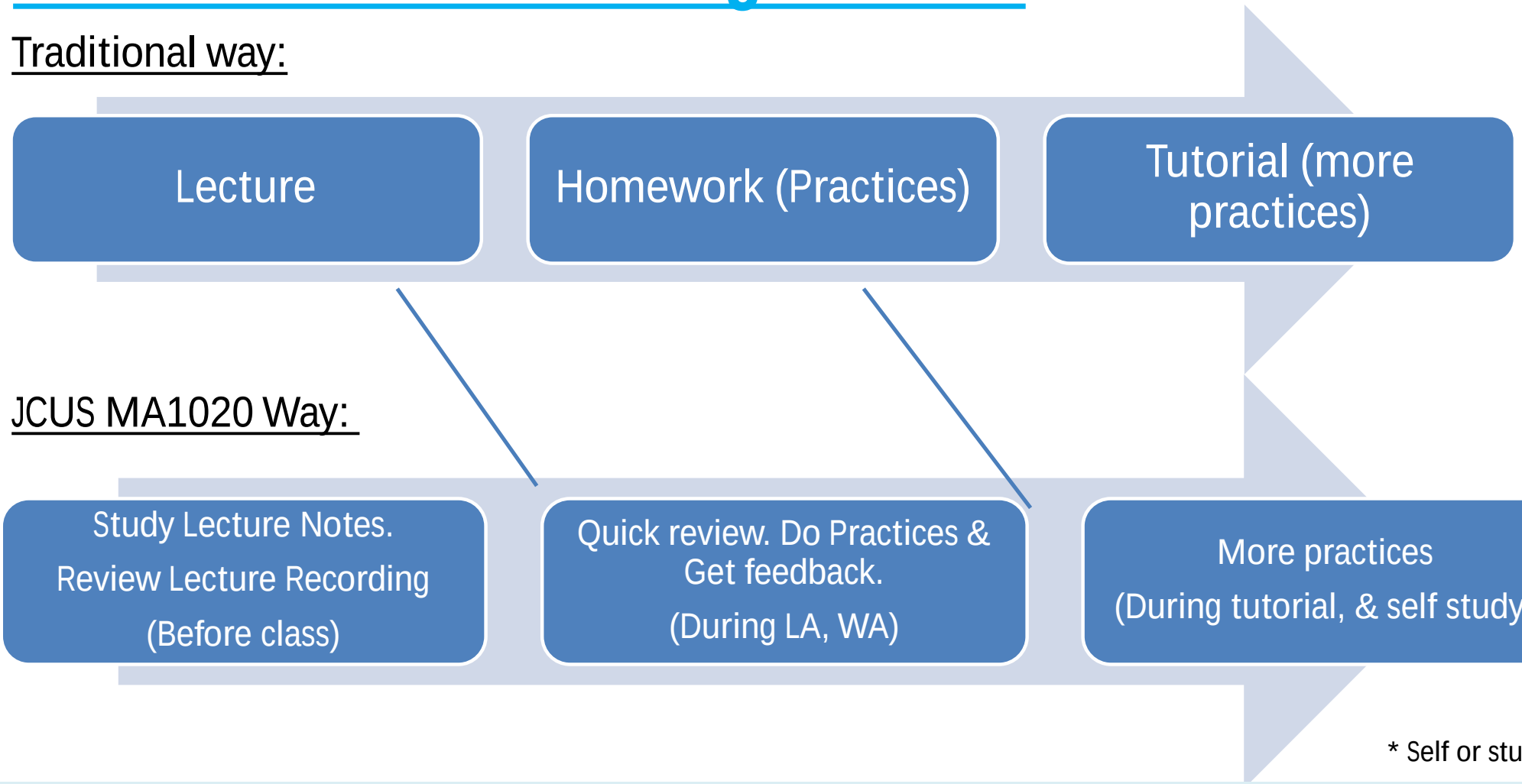
JCUS BU1007 – "statistics"

Structure of lectures

- The lectures are **purely online**.
- You are expected to have the online learning at your own pace during or before the lecture time.
- Lecturer will enter the virtual subject room during **Lecture 1** for instructions and questions and **the last 20 minutes of Lectures 2-10** for Q&A.
- Do NOT expect the lecturer to standby for the other times of lectures.
- If you have questions when having online learning, discuss them with your classmates via discussion board. If not solved, questions can be brought to the synchronous Q&A session or tutorial class.

JCUS MA1020 Learning Process

Traditional way:



* Self or study Group

Hours per week:	2 (Self*)	4 (LA & WA)	1 (Tute)	+ 3 – 6 (Self*)

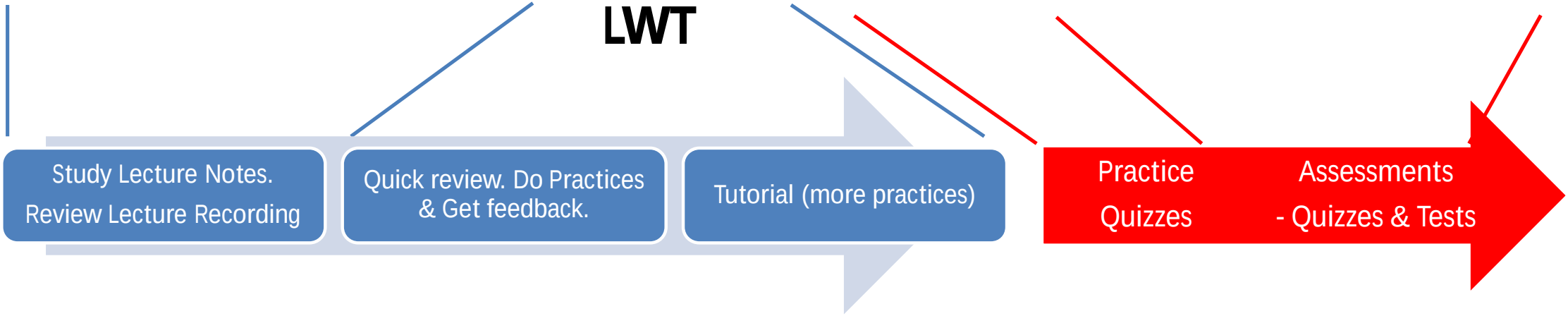
Student Study Plan

Week, begins	Study lecture notes & lecture recordings	Practise answering Exercise questions	Attend Lecture Workshop Tutorial	Self-Assess your learning	Take Quizzes (Total 5%)	Take Tests (Total 35%)
1 13/3	**Arithmetic 1.1 - 1.3**	Ex 1 – Ex 5 Tute Quiz 1	**LWT 1**			
2 20/3	**Arithmetic 1.4 - 1.6**	Ex 6 – Ex 8 Tute Quiz 2	**LWT 2**	Quiz 1 (1.1 - 1.4)	**Quiz 1 (1.1– 1.4) [24/3 – 31/3]**	
3 27/3	**Algebra 2.1 - [illegible]**	Ex 14 Tute Quiz 3	**LWT 3**	Practice Quiz 2 (1.5 – 2.1)	**Quiz 2 (1.5 – 2.1) [31/3 – 7/4]**	
3/4	**Algebra 2.2 – 2.3**	Ex 12 – Ex 17 Tute Quiz 4	**L 4 No WT, replace 21/4**			**Test 1 (5%) (1.1 – 2.1) 6 April 2023**

Please refer to the Student Study Plan for your trimester. This one is for briefing purpose only.

JCUS MA1020 Learning Process

Study lecture notes & lecture recordings	Practise answering Exercise questions	Attend Lecture Workshop Tutorial	Self-Assess your learning	Take Quizzes (Total 5%)	Take Tests (Total 35%)



MA1020 students have very different proficiency in Mathematics. Very proficient students can spend less time. Not so proficient students MUST put in more effort.
Be honest with yourself! If you cannot follow LWT well, you MUST study the lecture notes and view lecture recordings more. Or simply ask your lecturer where you need some help.

JCUS MA1020 Learning Process

Study lecture notes & lecture recordings	Practise answering Exercise questions	Attend Lecture Workshop Tutorial	Self-Assess your learning	Take Quizzes (Total 5%)	Take Tests (Total 35%)

Self/Group study

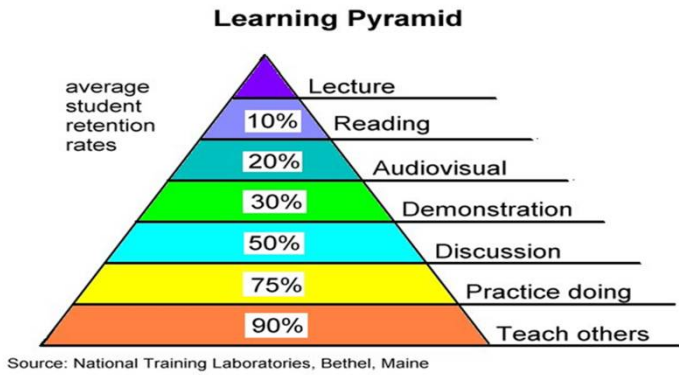
- Study Lecture notes
- View Lecture recordings
- Practice answering questions

Attend LWT

- Ask & Share
- Review key points
- Practice Q & A
- Show solution in class

Self Assess

- Review answers
- Practice quizzes
- Assessable Quizzes + Tests



Student's tasks & responsibilities

	Tasks	When
1	Review Lecture Notes and/or Recordings Practise exercise & tutorial questions	Before class
2	Participate in Lecture, Workshop & Tutorial	During class
3	Show worked solutions in class **= Participation in class = Criteria 5/"Requirements"**	During class
4	Self or Group study	Regularly
5	Attempt Practice Quizzes x 6	As needed
6	**Attempt Assessable Quizzes x 6**	When opened
7	**Attempt On-course Tests x 3**	On Test dates
8	**Attempt Final Exam x 1**	On Exam date

Workbook for all your worked solutions

- Your workbook is either:
  - A physical blank booklet or
  - Loose ruled A4 papers kept neatly in a folder
- Write solutions to questions onto Workbook
  - During lectures & workshop: that for your study group
  - During tutorial: the assigned questions, by students.

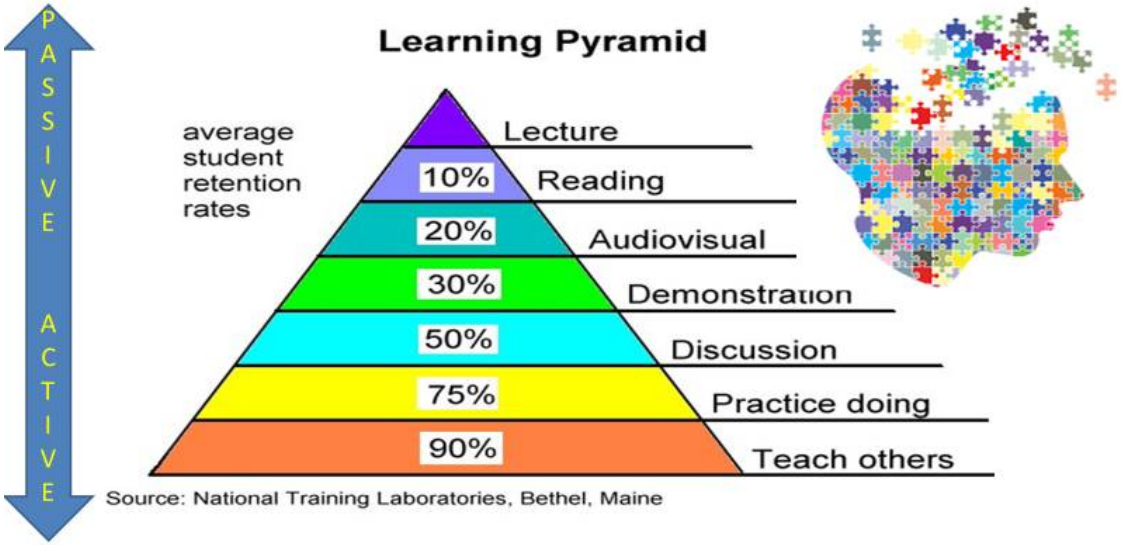
  Above is the minimum. You can and should do more.

  Can include your solutions to questions, before attending class
- Show your solutions in class
- Worked solutions in your workbook is your evidence of participation in class.

Perfect practice for your 3Tests and Exam

Study Group

- Initial grouping of 4-6 students
  - 1st student = leader
  - Participation & Peer Study
  - May change: 4-6/group, same tutorial
- Learn together
  - Answer exercises/quizzes
  - Ask questions
- Support each other
- Deepen U friendship



Basis for assigning questions, by study group, during Lectures, Workshops & Tutorials

MA1020 Workbook & Peer Study.pdf

Leverage Workbook & Peer Study to facilitate learning of MA1020.

A. Practice, Practice & Practice as an active & effective learning.

1. One of the four requirements to pass MA1020 is to demonstrate a satisfactory level of participation in tutorials and workshops.
2. The nature of mathematics is such that we will always build on the previous levels. In other words, learning must be continuous and sufficient robust to support the next level of learning.
3. Active learning, through practice doing of mathematical problem, is much more effective than passive learning through mere reading, viewing, and listening of subject material.

B. Peer Learning & Support through Study Groups

Students can ask their lecturer/tutor any question. Alternative, students may ask another student and peer study together. Study group is not compulsory but can be an effective support to learning.

How to prepare for & do well in MA1020?

1. Review lecture notes and lecture recordings
2. Attend class and participate in the exercises/quiz
3. **Don't know → ASK !**
4. **Practise^3: Practise, Practise and Practise**

   - all the exercise/quizzes
5. Attempts all assessments & learn from them

MA1020

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Happy Learning

MA1020 Preparatory Mathematics