



Course Outline (Higher Education)

School:	School of Education
Course Title:	ADVANCED MATHEMATICAL PEDAGOGIES
Course ID:	EDBED4111
Credit Points:	15.00
Prerequisite(s):	(EDBED3112)
Co-requisite(s):	(EDBED4112)
Exclusion(s):	Nil
ASCED:	070103

Description of the Course :

This course extends PSTs understanding of advanced pedagogies that are used to develop mathematical skills and cater for the diverse range of learners in any primary classroom. Thinking routines will be explored with a focus on using thinking routines as a regular feature of mathematics classes to strengthen links between mathematical concepts. Rich assessment tasks will be developed using real world contexts that engage students. These tasks will then be evaluated to understand the richness of data that is obtained from such tasks. Differentiation will be another focus of the course examining different ways that work can be differentiated in line with current theoretical research on differentiation. This course will explore pedagogies such as point of need teaching, inquiry and grouping within the classroom through data use. Writing accurate reports based on data and coding using both spreadsheets and commercially available software will also be explored.

Grade Scheme: Graded (HD, D, C, etc.)

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:**Knowledge:**

- K1.** Examine effective differentiation strategies for Mathematics at a primary level to meet the specific learning needs of students.
- K2.** Examine the links between curriculum assessment and reporting.
- K3.** Analyse point of need teaching and its links to differentiation.
- K4.** Explore a range of resources, including ICT resources that engages students.
- K5.** Recognise how thinking routines can provide activities that have multiple entry points.

Skills:

- S1.** Adapt work to differentiate for learners with specific learning needs.
- S2.** Write accurate reports based on a range of assessments data.
- S3.** Reflect on the thinking processes associated with the teaching and learning of Mathematics.
- S4.** Incorporate appropriate technology in the learning of Mathematics.
- S5.** Develop classroom activities that engage and meet learning needs.

Application of knowledge and skills:

- A1.** Develop a fully differentiated lesson plan incorporating theoretical understandings about the teaching and learning of Mathematics.
- A2.** Design classroom resources that use thinking routines as their basis.
- A3.** Write simple code for mathematical situations and develop coding for classroom use.
- A4.** Write accurate reports based on assessment data and other evidence.

Course Content:

Topics to be covered:

Differentiation

- Differentiation techniques for use in the primary mathematics classroom.
- Examining how current curriculum documents build learning sequences.
- Documenting differentiation in topic, term and yearly plans.
- Using assessment data as a tool to differentiate.
- Using evidence to construct reports based on evidence including assessment data.
- Using point of need teaching to differentiate instruction.

Thinking

- Linking thinking routines to the content strands of mathematics as listed in current curriculum documents.
- Designing learning activities and sequences in mathematics using thinking routines.
- The purpose and uses of rich assessment tasks.
- Writing rich assessment tasks with real world contexts for mathematics.
- Using inquiry in mathematics to extend all students.

Coding

- Coding through spreadsheets.
- Coding using commercially available software.

- Developing coding activities for classroom use.

Values:

- V1.** See the connections between thinking routines and the development of mathematical skills.
- V2.** Develop confidence and positive attitudes towards differentiation in the mathematics classroom.
- V3.** Develop confidence in planning for topics, terms and whole year mathematics lessons.
- V4.** Enjoy teaching and learning mathematics.

Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K3, S5, A2	A	AT1, AT3	A
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K4, S1, A1	A	AT3	A
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	K1, S1, A3	A	AT2	B
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	S2, A4	A	AT4	A
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	S4	B	AT3	C

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K5, S3, S5, A2; APST: 2.1, 2.5	Develop a set of activities for classroom use that use thinking routines. These activities must be linked to current curriculum documents.	Developing classroom resources	20-30%
K4, S4, A3; APST: 3.4, 2.6	Write code to solve simple mathematics based problems and develop a classroom coding activity for student use.	Developing classroom resources	20-30%
K1, K3, S1, S5, A1; APST: 1.5, 2.1, 2.3, 2.5	Develop fully differentiated lesson plans (including rationale) that incorporates a range of resources including ICT for a specific group of learners.	Academic report, Lesson Planning	40-60%
K2, S2, A4; APST: 2.3	Write accurate student reports in mathematics based on evidence and assessment data.	Hurdle task	S/U

Adopted Reference Style:

APA

Professional Standards / Competencies:
Australian Professional Standards for Teachers (AITSL) - Graduate Teacher: Initial

Attribute	Assessed	Level
Professional Knowledge		
1. Know students and how they learn		
1.5 Differentiate teaching to meet the specific learning needs of students across the full range of abilities Demonstrate knowledge and understanding of strategies for differentiating teaching to meet the specific learning needs of students across the full range of abilities.	Yes	Advanced
2. Know the content and how to teach it		
2.1 Content and teaching strategies of the teaching area Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.	Yes	Advanced
2.3 Curriculum, assessment and reporting Use curriculum, assessment and reporting knowledge to design learning sequences and lesson plans.	Yes	Advanced
2.5 Literacy and numeracy strategies Know and understand literacy and numeracy teaching strategies and their application in teaching areas.	Yes	Advanced
2.6 Information and Communication Technology (ICT) Implement teaching strategies for using ICT to expand curriculum learning opportunities for students.	Yes	Advanced
Professional Practice		
3. Plan for and implement effective teaching and learning		
3.4 Select and use resources Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.	Yes	Advanced