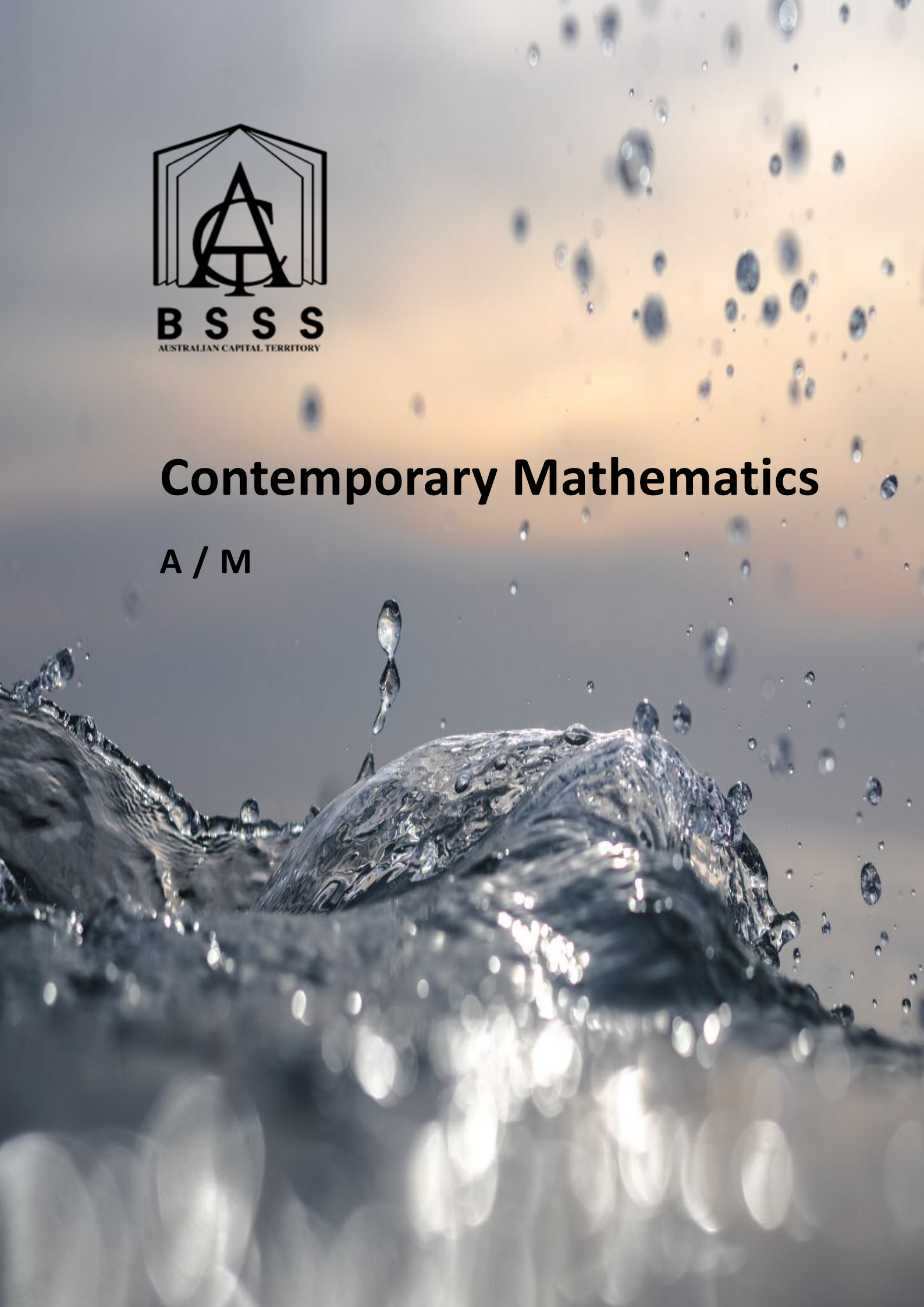
BSSS
AUSTRALIAN CAPITAL TERRITORY

Contemporary Mathematics

A / M



Cover Art provided by Canberra College student Aidan Giddings

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The ACT Senior Secondary System

The ACT senior secondary system recognises a range of university, vocational or life skills pathways.

The system is based on the premise that teachers are experts in their area: they know their students and community and are thus best placed to develop curriculum and assess students according to their needs and interests. Students have ownership of their learning and are respected as young adults who have a voice.

A defining feature of the system is school-based curriculum and continuous assessment. School-based curriculum provides flexibility for teachers to address students' needs and interests. College teachers have an opportunity to develop courses for implementation across ACT schools. Based on the courses that have been accredited by the BSSS, college teachers are responsible for developing programs of learning. A program of learning is developed by individual colleges to implement the courses and units they are delivering.

Teachers must deliver all content descriptions; however, they do have flexibility to emphasise some content descriptions over others. It is at the discretion of the teacher to select the texts or materials to demonstrate the content descriptions. Teachers can choose to deliver course units in any order and teach additional (not listed) content provided it meets the specific unit goals.

School-based continuous assessment means that students are continually assessed throughout years 11 and 12, with both years contributing equally to senior secondary certification. Teachers and students are positioned to have ownership of senior secondary assessment. The system allows teachers to learn from each other and to refine their judgement and develop expertise.

Senior secondary teachers have the flexibility to assess students in a variety of ways. For example: multimedia presentation, inquiry-based project, test, essay, performance and/or practical demonstration may all have their place. College teachers are responsible for developing assessment instruments with task specific rubrics and providing feedback to students.

The integrity of the ACT Senior Secondary Certificate is upheld by a robust, collaborative and rigorous structured consensus-based peer reviewed moderation process. System moderation involves all Year 11 and 12 teachers from public, non-government and international colleges delivering the ACT Senior Secondary Certificate.

Only students who desire a pathway to university are required to sit a general aptitude test, referred to as the ACT Scaling Test (AST), which moderates student course scores across subjects and colleges. Students are required to use critical and creative thinking skills across a range of disciplines to solve problems. They are also required to interpret a stimulus and write an extended response.

Senior secondary curriculum makes provision for student-centred teaching approaches, integrated and project-based learning inquiry, formative assessment and teacher autonomy. ACT Senior Secondary Curriculum makes provision for diverse learners and students with mild to moderate intellectual disabilities, so that all students can achieve an ACT Senior Secondary Certificate.

The ACT Board of Senior Secondary Studies (BSSS) leads senior secondary education. It is responsible for quality assurance in senior secondary curriculum, assessment and certification. The Board consists of representatives from colleges, universities, industry, parent organisations and unions. The Office of the Board of Senior Secondary Studies (OBSSS) consists of professional and administrative staff who support the Board in achieving its objectives and functions.

ACT Senior Secondary Certificate

Courses of study for the ACT Senior Secondary Certificate:

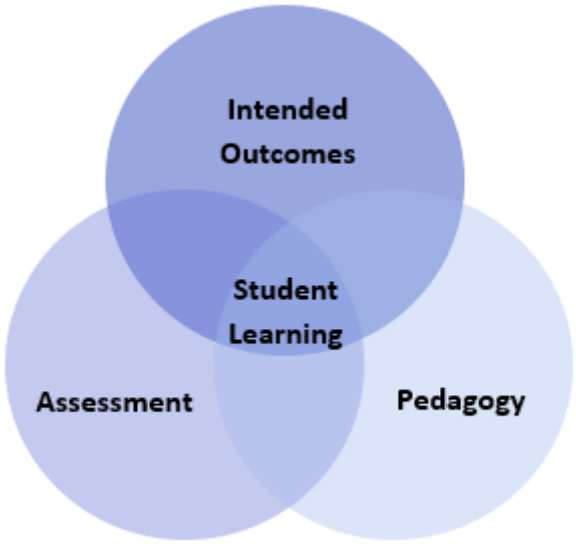
- provide a variety of pathways, to meet different learning needs and encourage students to complete their secondary education
- enable students to develop the essential capabilities for twenty-first century learners
- empower students as active participants in their own learning
- engage students in contemporary issues relevant to their lives
- foster students' intellectual, social and ethical development
- nurture students' wellbeing, and physical and spiritual development
- enable effective and respectful participation in a diverse society.

Each course of study:

- comprises an integrated and interconnected set of knowledge, skills, behaviours and dispositions that students develop and use in their learning across the curriculum
- is based on a model of learning that integrates intended student outcomes, pedagogy and assessment
- outlines teaching strategies which are grounded in learning principles and encompass quality teaching
- promotes intellectual quality, establish a rich learning environment and generate relevant connections between learning and life experiences
- provides formal assessment and certification of students' achievements.

Underpinning beliefs

- All students are able to learn.
- Learning is a partnership between students and teachers.
- Teachers are responsible for advancing student learning.



Learning Principles

1. Learning builds on existing knowledge, understandings and skills.
   (Prior knowledge)
2. When learning is organised around major concepts, principles and significant real world issues, within and across disciplines, it helps students make connections and build knowledge structures.
   (Deep knowledge and connectedness)
3. Learning is facilitated when students actively monitor their own learning and consciously develop ways of organising and applying knowledge within and across contexts.
   (Metacognition)
4. Learners' sense of self and motivation to learn affects learning.
   (Self-concept)
5. Learning needs to take place in a context of high expectations.
   (High expectations)
6. Learners learn in different ways and at different rates.
   (Individual differences)
7. Different cultural environments, including the use of language, shape learners' understandings and the way they learn.
   (Socio-cultural effects)
8. Learning is a social and collaborative function as well as an individual one.
   (Collaborative learning)
9. Learning is strengthened when learning outcomes and criteria for judging learning are made explicit and when students receive frequent feedback on their progress.
   (Explicit expectations and feedback)

General Capabilities

All courses of study for the ACT Senior Secondary Certificate should enable students to develop essential capabilities for twenty-first century learners. These 'capabilities' comprise an integrated and interconnected set of knowledge, skills, behaviours and dispositions that students develop and use in their learning across the curriculum.

The capabilities include:

- literacy
- numeracy
- information and communication technology (ICT)
- critical and creative thinking
- personal and social
- ethical behaviour
- intercultural understanding

Courses of study for the ACT Senior Secondary Certificate should be both relevant to the lives of students and incorporate the contemporary issues they face. Hence, courses address the following three priorities. These priorities are:

- Aboriginal and Torres Strait Islander histories and cultures
- Asia and Australia's engagement with Asia
- Sustainability

Elaboration of these General Capabilities and priorities is available on the ACARA website at www.australiancurriculum.edu.au.

Literacy

The Student Capabilities (Year 11-12), can be mapped to the Essential Learning Achievements in Every Chance to Learn: the curriculum framework for ACT Schools (P-10). Student capabilities are supported through course and unit content, and through pedagogical and assessment practices.

Literacy in Mathematics

In the senior years these literacy skills and strategies enable students to express, interpret, and communicate complex mathematical information, ideas and processes. Mathematics provides a specific and rich context for students to develop their ability to read, write, visualise and talk about complex situations involving a range of mathematical ideas. Students can apply and further develop their literacy skills and strategies by shifting between verbal, graphic, numerical and symbolic forms of representing problems in order to formulate, understand and solve problems and communicate results. Students learn to communicate their findings in different ways, using multiple systems of representation and data displays to illustrate the relationships they have observed or constructed.

Numeracy in Mathematics

The students who undertake this subject will continue to develop their numeracy skills at a more sophisticated level than in Years F to 10. This subject contains financial applications of Mathematics that will assist students to become literate consumers of investments, loans and superannuation products. It also contains statistics topics that will equip students for the ever-increasing demands of

the information age. Students will also learn about the probability of certain events occurring and will therefore be well equipped to make informed decisions about gambling.

Information and Communication Technology (ICT) Capability in Mathematics

In the senior years students use ICT both to develop theoretical mathematical understanding and apply mathematical knowledge to a range of problems. They use software aligned with areas of work and society with which they may be involved such as for statistical analysis, algorithm generation, data representation and manipulation, and complex calculation. They use digital tools to make connections between mathematical theory, practice and application; for example, to use data, to address problems, and to operate systems in authentic situations.

Critical and Creative Thinking in Mathematics

Students compare predictions with observations when evaluating a theory. They check the extent to which their theory-based predictions match observations. They assess whether, if observations and predictions don't match, it is due to a flaw in theory or method of applying the theory to make predictions – or both. They revise, or reapply their theory more skilfully, recognising the importance of self-correction in the building of useful and accurate theories and making accurate predictions.

Personal and Social Capability in Mathematics

In the senior years students develop personal and social competence in Mathematics through setting and monitoring personal and academic goals, taking initiative, building adaptability, communication, teamwork and decision-making.

The elements of personal and social competence relevant to Mathematics mainly include the application of mathematical skills for their decision-making, life-long learning, citizenship and self-management. In addition, students will work collaboratively in teams and independently as part of their mathematical explorations and investigations.

Ethical Understanding in Mathematics

In the senior years students develop ethical behaviour in Mathematics through decision-making connected with ethical dilemmas that arise when engaged in mathematical calculation and the dissemination of results and the social responsibility associated with teamwork and attribution of input.

The areas relevant to Mathematics include issues associated with ethical decision-making as students work collaboratively in teams and independently as part of their mathematical explorations and investigations. Acknowledging errors rather than denying findings and/or evidence involves resilience and examined ethical behaviour. Students develop increasingly advanced communication, research and presentation skills to express viewpoints.

Intercultural Understanding in Mathematics

Students understand Mathematics as a socially constructed body of knowledge that uses universal symbols but has its origin in many cultures. Students understand that some languages make it easier to acquire mathematical knowledge than others. Students also understand that there are many culturally diverse forms of mathematical knowledge, including diverse relationships to number and that diverse cultural spatial abilities and understandings are shaped by a person’s environment and language.

Cross Curriculum Priorities

Aboriginal and Torres Strait Islander Histories and Cultures

The Senior Secondary Mathematics curriculum values the histories, cultures, traditions and languages of Aboriginal and Torres Strait Islander Peoples past and ongoing contributions to contemporary Australian society and culture. Through the study of mathematics within relevant contexts, opportunities will allow for the development of students' understanding and appreciation of the diversity of Aboriginal and Torres Strait Islander Peoples histories and cultures.

Asia and Australia's Engagement with Asia

There are strong social, cultural and economic reasons for Australian students to engage with the countries of Asia and with the past and ongoing contributions made by the peoples of Asia in Australia. It is through the study of mathematics in an Asian context that students engage with Australia's place in the region. Through analysis of relevant data, students are provided with opportunities to further develop an understanding of the diverse nature of Asia's environments and traditional and contemporary cultures.

Sustainability

Each of the senior mathematics subjects provides the opportunity for the development of informed and reasoned points of view, discussion of issues, research and problem solving. Therefore, teachers are encouraged to select contexts for discussion connected with sustainability. Through analysis of data, students have the opportunity to research and discuss this global issue and learn the importance of respecting and valuing a wide range of world perspectives.

Contemporary Mathematics

A/M

Rationale

Mathematics is the study of order, relation and pattern. From its origins in counting and measuring it has evolved in highly sophisticated and elegant ways to become the language now used to describe much of the modern world. Statistics is concerned with collecting, analysing, modelling and interpreting data in order to investigate and understand real-world phenomena and solve problems in context. Together, mathematics and statistics provide a framework for thinking and a means of communication that is powerful, logical, concise and precise.

The focus of Contemporary Mathematics A/M is the numeracy skills students will require in employment post-college and to manage their personal finances. These numeracy skills are aligned with Level 3 of the Australian Course Skills Framework, which was developed by the Australian Government in consultation with employer and industry groups.

This course is designed to meet the needs of students who are not otherwise catered for in the new courses integrating the Australian Curriculum. It has been written with both 0.5 and 1.0 units to allow maximum flexibility for the colleges in meeting the needs of their students.

Goals

Contemporary Mathematics aims to develop students':

- understanding of numerical and mathematical concepts and techniques with real-world applications
- ability to solve applied problems using concepts and techniques in real-world situations
- reasoning in mathematical and statistical contexts and interpretation of mathematical and statistical information
- capacity to communicate in a concise and systematic manner using appropriate mathematical and statistical language
- capacity to choose and use technology appropriately and efficiently.

Unit Titles

- Unit 1 Contemporary Mathematics
- Unit 2 Contemporary Mathematics
- Unit 3 Contemporary Mathematics
- Unit 4 Contemporary Mathematics

Organisation of Content

Contemporary Mathematics A/M is a thematic course that focuses on mathematical skills for employment and everyday life.

Unit 1

Students will study numeracy in the workplace (for example, income and payroll maths, workplace problem solving, mathematics for Industry and VET).

Unit 2

Students will study financial numeracy (for example, money management, banking and financial loans).

Unit 3

Students with study numeracy skills for living (for example, budget, tenancy, mathematics of transport and travel).

Unit 4

Students will study numeracy skills required for maintaining personal and supporting others' health. It includes, maths relating to nutrition, diet, medication and exercise.

Assessment

The identification of criteria within the achievement standards and assessment task types and weightings provides a common and agreed basis for the collection of evidence of student achievement.

Assessment Criteria (the dimensions of quality that teachers look for in evaluating student work) provide a common and agreed basis for judgement of performance against unit and course goals, within and across colleges. Over a course, teachers must use all these criteria to assess students' performance but are not required to use all criteria on each task. Assessment criteria are to be used holistically on a given task and in determining the unit grade.

Assessment Tasks elicit responses that demonstrate the degree to which students have achieved the goals of a unit based on the assessment criteria. The Common Curriculum Elements (CCE) is a guide to developing assessment tasks that promote a range of thinking skills (see Appendix C). It is highly desirable that assessment tasks engage students in demonstrating higher order thinking.

Rubrics are constructed for individual tasks, informing the assessment criteria relevant for a particular task and can be used to assess a continuum that indicates levels of student performance against each criterion.

Assessment Criteria

Students will be assessed on the degree to which they demonstrate an understanding of:

- concepts and techniques
- reasoning and communications.

Assessment Task Types

Suggested tasks:

- project/assignment
- modelling projects
- portfolio
- journal
- validation activity
- presentation such as a pitch, poster, vodcast, interview
- practical activity such as a demonstration
- test/examination
- online adaptive tasks/quiz

Weightings in A/T/M 1.0 Units:

No task to be weighted more than 50% for a standard 1.0 unit.

Additional Assessment Information

Requirements

- For a standard unit (1.0), students must complete a minimum of three assessment tasks and a maximum of five.
- For a half standard unit (0.5), students must complete a minimum of two and a maximum of three assessment tasks.
- Assessment tasks for a standard (1.0) or half-standard (0.5) unit must be informed by the Achievement Standards.
- Students should experience a variety of task types (test and non-test) and different modes of communication to demonstrate the Achievement Standards.
- Students are required to undertake at least one problem solving investigation task each semester. This task may be completed individually or collaboratively. They are required to plan, enquire into and draw conclusions about key unit concepts. Students may respond in forms such as modelling projects, problem solving and practical activities.

Advice

- It is recommended that the total component of unsupervised tasks be no greater than 30%.
- For tasks completed in unsupervised conditions, schools need to have mechanisms to uphold academic integrity, for example, student declaration, plagiarism software, oral defence, interview, other validation tasks

Achievement Standards

Years 11 and 12 Achievement Standards are written for A/T courses. A single achievement standard is written for M courses.

A Year 12 student in any unit is assessed using the Year 12 achievement standards. A Year 11 student in any unit is assessed using the Year 11 achievement standards. Year 12 achievement standards reflect higher expectations of student achievement compared to the Year 11 achievement standards. Years 11 and 12 achievement standards are differentiated by cognitive demand, the number of dimensions and the depth of inquiry.

An achievement standard cannot be used as a rubric for an individual assessment task. Assessment is the responsibility of the college. Student tasks may be assessed using rubrics or marking schemes devised by the college. A teacher may use the achievement standards to inform development of rubrics. The verbs used in achievement standards may be reflected in the rubric. In the context of combined Years 11 and 12 classes, it is best practice to have a distinct rubric for Years 11 and 12. These rubrics should be available for students prior to completion of an assessment task so that success criteria are clear.

Achievement Standards for Mathematics A Course – Year 11

	*A student who achieves an **A** grade typically*	*A student who achieves a **B** grade typically*	*A student who achieves a **C** grade typically*	*A student who achieves a **D** grade typically*	*A student who achieves an **E** grade typically*
Concepts and Techniques	• applies mathematical concepts in a variety of complex contexts to routine and non-routine problems • select and applies mathematical techniques to solve routine and non-routine problems in a variety of complex contexts • uses digital technologies effectively to solve routine and non-routine problems in a variety of contexts	• applies mathematical concepts in a variety of contexts to routine and non-routine problems • applies mathematical techniques to solve routine and non-routine problems in a variety of contexts • uses digital technologies appropriately to solve routine and non-routine problems in a variety of contexts	• applies mathematical concepts in some contexts to routine and non-routine problems • applies simple mathematical techniques to solve routine problems in some contexts • uses digital technologies appropriately to solve routine problems in some contexts	• applies simple mathematical concepts in limited contexts to routine problems • applies simple mathematical techniques to solve routine problems in limited contexts • uses digital technologies to solve routine problems in structured contexts	• applies simple mathematical concepts in structured contexts • applies simple mathematical techniques to solve routine problems in structured contexts • uses digital technologies to solve routine problems in structured contexts
Reasoning and Communications	• represents some complex mathematical concepts in numerical and graphical form in routine and non-routine problems for a variety of contexts • communicates mathematical information in oral, written and/or multimodal forms, which are well reasoned, using accurate and appropriate language • reflects with insight on own thinking and learning, evaluates planning, time management, use of appropriate strategies to work independently and collaboratively • evaluates the potential of Mathematics to generate knowledge in the public good	• represents mathematical concepts in numerical and graphical form in routine and non-routine problems for a variety of contexts • communicates mathematical information in oral, written and/or multimodal forms, which are clear, using accurate and appropriate language • reflects on own thinking and learning, analyses inter and intrapersonal skills including planning, time management, use of appropriate strategies to work independently and collaboratively • analyses the potential of Mathematics to generate knowledge in the public good	• represents mathematical concepts in numerical and graphical form to some routine and non-routine problems for routine contexts • communicates mathematical judgements in oral, written and/or multimodal forms, using appropriate language • reflects on own thinking and learning, explains planning, time management, use of appropriate strategies to work independently and collaboratively • explains the potential of Mathematics to generate knowledge in the public good	• represents simple mathematical concepts in numerical or graphical form in routine problems for routine contexts • communicates simple mathematical judgements in oral, written and/or multimodal forms, with some use of appropriate language • reflects on their own thinking with some reference to planning, time management, use of appropriate strategies to work independently and collaboratively • describes the potential of Mathematics to generate knowledge in the public good	• represents simple mathematical concepts in numerical or graphical form in routine problems for structured contexts • communicates simple mathematical information in oral, written and/or multimodal forms, with limited use of appropriate language • reflects on their own thinking with little or no reference to planning, time management, use of appropriate strategies to work independently and collaboratively • identifies some ways in which Mathematics is used to generate knowledge in the public good

Achievement Standards for Mathematics A Course – Year 12

	*A student who achieves an **A** grade typically*	*A student who achieves a **B** grade typically*	*A student who achieves a **C** grade typically*	*A student who achieves a **D** grade typically*	*A student who achieves an **E** grade typically*
Concepts and Techniques	• applies mathematical concepts in a variety of complex contexts to routine and non-routine problems • select and applies mathematical techniques to solve routine and non-routine problems in a variety of contexts • uses digital technologies effectively to solve routine and non-routine problems in a variety of contexts	• applies mathematical concepts in a variety of contexts to routine and non-routine problems • applies mathematical techniques to solve routine and non-routine problems in a variety of contexts • uses digital technologies appropriately to solve routine and non-routine problems in a variety of contexts	• applies mathematical concepts in some contexts to routine and non-routine problems • applies simple mathematical techniques to solve routine problems in some contexts • uses digital technologies appropriately to solve routine problems in some contexts	• applies simple mathematical concepts in limited contexts to routine problems • uses simple mathematical techniques to solve routine problems in limited contexts • uses digital technologies to solve routine problems in limited contexts	• applies simple mathematical concepts in structured contexts • uses simple mathematical techniques to solve routine problems in structured contexts • uses digital technologies to solve routine problems in structured contexts
Reasoning and Communications	• represents ~~some~~ complex mathematical concepts in numerical and graphical form in routine and non-routine problems in a variety of contexts • communicates mathematical information in oral, written and/or multimodal forms, which are logical and reasoned, using appropriate language • analyse the reasonableness of solutions to routine and non-routine problems in a variety of contexts • reflects with insight on their own thinking and that of others and evaluates planning, time management, use of appropriate strategies to work independently and collaboratively • evaluates the potential of Mathematics to generate knowledge in the public good	• represents mathematical concepts in numerical and graphical form in routine and non-routine problems in a variety of contexts • communicates mathematical information in oral, written and/or multimodal forms, which are logical and clear, using appropriate language • explains the reasonableness of solutions to routine and non-routine problems • reflects on their own thinking and analyses planning, time management, use of appropriate strategies to work independently and collaboratively • analyses the potential of Mathematics to generate knowledge in the public good	• represents mathematical concepts in numerical and graphical form to some routine and non-routine problems in some contexts • communicates mathematical judgements in oral, written and/or multimodal forms, using appropriate language • describes the reasonableness of solutions to some routine and non-routine problems • reflects on their own thinking and explains planning, time management, use of appropriate strategies to work independently and collaboratively • explains the potential of Mathematics to generate knowledge in the public good	• represents simple mathematical concepts in numerical or graphical form in routine problems in structured contexts • communicates simple mathematical judgements in oral, written and/or multimodal forms, with some use of appropriate language • describes the appropriateness of solutions to routine problems • reflects on their own thinking with some reference to planning, time management, use of appropriate strategies to work independently and collaboratively • describes the potential of Mathematics to generate knowledge in the public good	• represents simple mathematical concepts in numerical or graphical form in structured contexts • communicates simple mathematical information in oral, written and/or multimodal forms, with limited use of appropriate language • identifies solutions to routine problems • reflects on their own thinking with little or no reference to planning, time management, use of appropriate strategies to work independently and collaboratively • identifies some ways in which Mathematics is used to generate knowledge in the public good

Achievement Standards for Mathematics M Course – Years 11 and 12

	*A student who achieves an **A** grade typically*	*A student who achieves a **B** grade typically*	*A student who achieves a **C** grade typically*	*A student who achieves a **D** grade typically*	*A student who achieves an **E** grade typically*
Concepts and Techniques	• applies numeracy skills in a variety of contexts to routine and non-routine problems, with independence • uses digital technologies effectively to solve routine and non-routine problems in a variety of contexts, with independence	• applies numeracy skills in a variety of contexts to routine and non-routine problems, with some independence • uses digital technologies appropriately to solve routine and non-routine problems in a variety of contexts, with some independence	• applies numeracy skills in some contexts to routine and non-routine problems, with assistance • uses digital technologies appropriately to solve routine problems in limited contexts, with assistance	• applies simple numeracy skills in limited contexts to routine problems, with repeated cueing • uses digital technologies to solve routine problems in structured contexts, with repeated cueing	• applies simple numeracy skills in structured contexts, with direct instruction • uses digital technologies efficiently to solve routine and non-routine problems in a variety of contexts, with direct instruction
Reasoning and Communications	• represents numeracy skills in numerical and graphical form in routine and non-routine problems in a variety of contexts, with independence • communicates mathematical information in oral, written and/or multimodal forms, using appropriate language, with independence • reflects with insight on own thinking and learning in mathematics, with independence	• represents numeracy skills in numerical and graphical form in routine and non-routine problems, with some independence • communicates mathematical information in oral, written and/or multimodal forms, using appropriate language, with some independence • reflects on own thinking and learning in mathematics, with some independence	• represents numeracy skills in numerical and graphical form in some routine and non-routine problems, with assistance • communicates mathematical information in oral, written and/or multimodal forms, using appropriate language, with assistance • reflects on own thinking and learning in mathematics, with assistance	• represents simple numeracy skills in numerical or graphical form in routine problems, with repeated cueing • communicates simple mathematical information in oral, written and/or multimodal forms, using appropriate language, with repeated cueing • reflects on own thinking and learning in mathematics, with repeated cueing	• represents simple numeracy skills in numerical or graphical form in structured contexts, with direct instruction • communicates simple mathematical information in oral, written and/or multimodal forms, using appropriate language, with direct instruction • reflects on own thinking and learning in mathematics, with frequent prompting

Unit 1: Contemporary Mathematics — Value: 1.0

Unit 1a: Contemporary Mathematics — **Value: 0.5**

Unit 1b: Contemporary Mathematics — **Value: 0.5**

Unit Description

Students will study numeracy in the workplace (for example, income and payroll maths, workplace problem solving, mathematics for Industry and VET).

Specific Unit Goals

This unit should enable students to:

A course	M course
• select and interpret mathematical information that may be partly embedded in a range of familiar, and some less familiar tasks and texts • select from and use a variety of developing mathematical and problem solving strategies in a range of familiar and some less familiar contexts • use a combination of both informal and formal oral and written mathematical language and representation to communicate mathematically	• select and interpret mathematical information that may be partly embedded in a range of familiar, and some less familiar tasks and texts • select from and use a variety of developing mathematical and problem solving strategies in a range of familiar and some less familiar contexts • use a combination of both informal and formal oral and written mathematical language and representation to communicate mathematically

Content Descriptions

All knowledge, understanding and skills below must be delivered:

A course	M course

• interprets and comprehends a range of everyday mathematical information that is embedded in familiar and routine texts
• interprets and comprehends:
  ○ whole numbers and familiar or routine fractions, decimals and percentages
	• identifies and interprets simple mathematical information in familiar and simple oral instructions and written texts where the mathematics is partially embedded
	• identifies and interprets:
	  ○ whole numbers and simple fractions, decimals and percentages

A course	M course
○ familiar and routine measurement (for example, dates and time, including 24 hour times, 2D and 3D shapes, including pyramids and cylinders, length, mass, volume/capacity, temperature and simple area measures, maps and plans	○ familiar and simple measurement (for example, dates and time, including 24 hour times, 2D and 3D shapes, including pyramids and cylinders, length, mass, volume/capacity, temperature and simple area measures, maps and plans
• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to: ○ select appropriate methods of solution from a limited range of mathematical processes ○ use developing estimation, and other assessment skills, to check and reflect on the outcome and its appropriateness to the context and task	• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to: ○ select appropriate methods of solution from a limited range of mathematical processes ○ use developing estimation skills, to check and reflect on the outcome and its appropriateness to the context and task
• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate	• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate
• uses calculator/technological processes and tools to undertake the problem solving process	• uses calculator/technological processes and tools to undertake the problem solving process
• selects and uses appropriate tools, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet	• identifies and uses appropriate tools, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet
• calculates with whole numbers and everyday or routine fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250	• identifies and uses whole numbers and everyday or simple fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250
• uses and applies order of arithmetical operations to solve multi-step calculations	• uses and applies order of arithmetical operations to perform a limited range of
• uses and applies rates in familiar or routine situations, e.g. km/hr, $/kg or $/m	

A course	M course
• perform measurements, estimates and calculations using for example, 2D and 3D shapes, constructing common 3D shapes, length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using A = L x W, or estimates area of a non-rectangular shape by counting squares), distance, direction, coordinates, simple scales, labels, symbols and keys to read and use everyday maps and plans	• perform simple measurements, estimates and calculations using for example, 2D and 3D shapes, constructing some common 3D shapes, length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using A = L x W, or estimates area of a non-rectangular shape by counting squares), distance, direction, coordinates, simple scales, labels, symbols and keys to read familiar everyday maps and plans
• uses a combination of both informal and formal written mathematical language and symbols and general language to document and report on the mathematical and problem solving process and results	• uses a combination of mainly informal and some formal written mathematical and general language to represent the mathematical and problem solving process
• uses a combination of both informal and formal oral mathematical and general language to present and discuss the mathematical and problem solving process and result	• uses a combination of mainly informal and some formal oral mathematical and general language to report on and discuss the mathematical and problem solving process
• uses a combination of both formal and informal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm	• uses a combination of mainly informal and some formal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm

A guide to reading and implementing content descriptions

Content descriptions specify the knowledge, understanding and skills that students are expected to learn and that teachers are expected to teach. Teachers are required to develop a program of learning that allows students to demonstrate all the content descriptions. The lens which the teacher uses to demonstrate the content descriptions may be either guided through provision of electives within each unit or determined by the teacher when developing their program of learning.

A program of learning is what a college provides to implement the course for a subject. It is at the discretion of the teacher to emphasis some content descriptions over others. The teacher may teach additional (not listed) content provided it meets the specific unit goals. This will be informed by the student needs and interests.

Electives

For a standard 1.0 unit, a student must study a minimum of TWO electives from below.

For a half-standard 0.5 unit, a student must study a minimum of ONE elective from below.

Elective 1: Income and Payroll Maths

Topics may include:

- salaries and wages
- fulltime, part time and casual rates
- productivity wages (e.g. commissions and piecework)
- allowances
- timesheets
- reading pay slips
- understanding awards
- leave
- union fees and other voluntary deductions
- social security payments
- tax rates and returns
- superannuation
- personal banking websites

Elective 2: Workplace problem solving

Topics may include:

- review of basics of measurement including unit conversions
- understanding quotes and invoices including GST
- equipment costing and purchasing for the workplace
- rights as an employee
- rosters
- planning deliveries including packing of trucks
- evacuation plans and processes
- design or renovation of venues or office spaces (e.g. costing, scale diagrams, use of 2/3D models)
- event management
- capacity of venues
- giving directions to and from a workplace

Elective 3: Mathematics for Industry and VET

Topics may include:

- Estimation
- problem solving strategies – e.g. understand information, seek extra information, draw a diagram, guess and check
- "in-the-head" calculations
    - number (+, – , ÷, × order of operating)
    - squares/square roots
    - fractions
    - decimals
    - rounding
    - ratios
    - routine percentages
- with calculators
    - non-routine percentages
    - time – hours, minutes, days
    - substitution into formulae – including area and volume
    - transforming formulae
- Trade and industry specific applications – choose these on the basis of the interests of the students.

Elective 4: Negotiated Study

A negotiated study unit has an important place in senior secondary courses. It is a valuable pedagogical approach that empowers students to make decisions about their own learning. A negotiated study unit is decided upon by a class, group(s) or individual student in consultation with the teacher and with the principal's approval. The program of learning for a negotiated study unit must meet all the content descriptions as appears in the unit.

Assessment

Refer to pages 8-10.

Unit 2: Contemporary Mathematics — Value: 1.0

Unit 2a: Contemporary Mathematics — **Value: 0.5**

Unit 2b: Contemporary Mathematics — **Value: 0.5**

Unit Description

Students will study financial numeracy (for example, money management, banking and financial loans).

Unit Goals

This unit should enable students to:

A course	M course
• select and interpret mathematical information that may be partly embedded in a range of familiar, and some less familiar tasks and texts • select from and use a variety of developing mathematical and problem solving strategies in a range of familiar and some less familiar contexts • use a combination of both informal and formal oral and written mathematical language and representation to communicate mathematically	• select and interpret mathematical information that may be partly embedded in a range of familiar, and some less familiar tasks and texts • select from and use a variety of developing mathematical and problem solving strategies in a range of familiar and some less familiar contexts • use a combination of both informal and formal oral and written mathematical language and representation to communicate mathematically

Content Descriptions

All knowledge, understanding and skills below must be delivered:

A course	M course

• interprets and comprehends a range of everyday mathematical information that is embedded in familiar and routine texts
• interprets and comprehends:
  ○ whole numbers and familiar or routine fractions, decimals and percentages
  ○ dates and time, including 24 hour times
	• identifies and interprets simple mathematical information in familiar and simple oral instructions and written texts where the mathematics is partially embedded
	• identifies and interprets:
	  ○ whole numbers and simple fractions, decimals and percentages
	  ○ dates and time

A course	M course

• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to:
  ○ select appropriate methods of solution from a limited range of mathematical processes
  ○ use developing estimation, and other assessment skills, to check and reflect on the outcome and its appropriateness to the context and task
	• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to:
	  ○ select appropriate methods of solution from a limited range of mathematical processes
	  ○ use developing estimation skills, to check and reflect on the outcome and its appropriateness to the context and task

• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate and uses calculator/technological processes and tools to undertake the problem solving process	• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate and uses calculator/technological processes and tools to undertake the problem solving process
• selects and uses appropriate tools, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet	• identifies and uses appropriate tools in familiar applications, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet
• calculates with whole numbers and everyday or routine fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250	• identifies and uses whole numbers and everyday or simple fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250
• uses and applies order of arithmetical operations to solve multi-step calculations	• uses and applies order of simple arithmetical operations to perform a limited range of calculations
• uses and applies rates in familiar or routine situations, e.g. km/hr, $/kg or $/m	
• uses a combination of both informal and formal written mathematical language and symbols and general language to document and report on the mathematical and problem solving process and results	• uses a combination of mainly informal and some formal written mathematical and general language to represent the mathematical and problem solving process

A course	M course
• uses a combination of both informal and formal oral mathematical and general language to present and discuss the mathematical and problem solving process and result	• uses a combination of mainly informal and some formal oral mathematical and general language to report on and discuss the mathematical and problem solving process
• uses a combination of both formal and informal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm	• uses a combination of mainly informal and some formal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm

A guide to reading and delivering content descriptions

Content descriptions specify the knowledge, understanding and skills that students are expected to learn and that teachers are expected to teach. Teachers are required to develop a program of learning that allows students to demonstrate all the content descriptions. The lens which the teacher uses to demonstrate the content descriptions may be either guided through provision of electives within each unit or determined by the teacher when developing their program of learning.

A program of learning is what a college provides to implement the course for a subject. It is at the discretion of the teacher to emphasis some content descriptions over others. The teacher may teach additional (not listed) content provided it meets the specific unit goals. This will be informed by the student needs and interests.

Electives

For a standard 1.0 unit, a student must study a minimum of TWO electives from below.

For a half-standard 0.5 unit, a student must study a minimum of ONE elective from below.

Elective 1: Money Management

Topics may include:

- credit cards
- credit ratings
- pay-day loans
- mobile phone plans
- shopping on-line
- interest free terms and store credit
- negotiated payment plans
- planned payments e.g. lay-by, Xmas clubs
- interest on borrowing money
- consumer rights and responsibilities
- scams and phishing

Elective 2: Banking and Financial Planning

Topics may include:

- home and personal loans and associated costs
- insurance
- reading bank statements
- on-line banking and security
- direct debit
- banking costs including fees, charges and statements
- investment and returns e.g. saving plans, term deposits, high-yield accounts, shares

Elective 3: Negotiated Study

A negotiated study unit has an important place in senior secondary courses. It is a valuable pedagogical approach that empowers students to make decisions about their own learning. A negotiated study unit is decided upon by a class, group(s) or individual student in consultation with the teacher and with the principal's approval. The program of learning for a negotiated study unit must meet all the content descriptions as appears in the unit.

The negotiated project of this unit must focus on the over-arching theme of managing money. Some suggestions are:

- investing in a share portfolio
- superannuation
- home loans

Assessment

Refer to pages 8-10.

Unit 3: Contemporary Mathematics — Value: 1.0

Unit 3a: Contemporary Mathematics — **Value: 0.5**

Unit 3b: Contemporary Mathematics — **Value: 0.5**

Unit Description

Students with study numeracy skills for living (for example, budgeting and tenancy, mathematics of transport, and travel).

Unit Goals

This unit should enable students to:

A course	M course
• demonstrate the basics of personal financial management and budgets • develop knowledge of a variety of accommodation types including associated costs • develop a knowledge of the issues and costs with maintaining and using a motor vehicle	• demonstrate the basics of personal financial management and budgets • develop a basic knowledge of a variety of accommodation types including associated costs • develop a basic understanding of selected costs with maintaining and using a motor vehicle

Content Descriptions

All knowledge, understanding and skills below must be delivered:

A course	M course

• interprets and comprehends a range of everyday mathematical information that is embedded in familiar and routine texts
• interprets and comprehends:
  ○ whole numbers and familiar or routine fractions, decimals and percentages
  ○ familiar and routine measurement (for example, dates and time, including 24 hour times, 2D and 3D shapes, including pyramids and cylinders, length, mass, volume/capacity, temperature and simple area measures, maps and plans
	• identifies and interprets simple mathematical information in familiar and simple oral instructions and written texts where the mathematics is partially embedded
	• identifies and interprets:
	  ○ whole numbers and simple fractions, decimals and percentages
	  ○ familiar and simple measurement (for example, dates and time, 2D and 3D shapes, including pyramids and cylinders, length, mass, volume/capacity, temperature and simple area measures, simple maps and plans

A course	M course

• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to:
  ○ select appropriate methods of solution from a limited range of mathematical processes
  ○ use developing estimation, and other assessment skills, to check and reflect on the outcome and its appropriateness to the context and task
	• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to:
	  ○ select appropriate methods of solution from a limited range of mathematical processes
	  ○ use developing estimation skills, to check and reflect on the outcome and its appropriateness to the context and task

• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate and uses calculator/technological processes and tools to undertake the problem solving process	• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate and uses calculator/technological processes and tools to undertake the problem solving process
• selects and uses appropriate tools, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet	• identifies and uses appropriate tools in familiar applications, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet
• calculates with whole numbers and everyday or routine fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250	• identifies and uses whole numbers and everyday or simple fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250
• uses and applies order of arithmetical operations to solve multi-step calculations	• uses and applies order of simple arithmetical operations to perform a limited range of calculations
• uses and applies rates in familiar or routine situations, e.g. km/hr, $/kg or $/m	

A course	M course
• perform measurements, estimates and calculations using for example, 2D and 3D shapes, constructing common 3D shapes, length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using A = L x W, or estimates area of a non-rectangular shape by counting squares), distance, direction, coordinates, simple scales, labels, symbols and keys to read and use everyday maps and plans	• perform simple measurements, estimates and calculations using for example, 2D and 3D shapes, constructing some common 3D shapes, length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using A = L x W, or estimates area of a non-rectangular shape by counting squares), distance, direction, coordinates, simple scales, labels, symbols and keys to read familiar everyday maps and plans
• converts between routine metric units by applying understanding of common prefixes, e.g. milli, centi or kilo	
• collects and organises familiar data and constructs tables, graphs and charts, manually or with spreadsheets, using simple and familiar or routine scales and axes	• orders and uses familiar data to construct simple charts and tables on provided scales and axes
• uses a combination of both informal and formal written mathematical language and symbols and general language to document and report on the mathematical and problem solving process and results	• uses a combination of mainly informal and some formal written mathematical and general language to represent the mathematical and problem solving process
• uses a combination of both informal and formal oral mathematical and general language to present and discuss the mathematical and problem solving process and result	• uses a combination of mainly informal and some formal oral mathematical and general language to report on and discuss the mathematical and problem solving process
• uses a combination of both formal and informal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm	• uses a combination of mainly informal and some formal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm

A guide to reading and delivering content descriptions

Content descriptions specify the knowledge, understanding and skills that students are expected to learn and that teachers are expected to teach. Teachers are required to develop a program of learning that allows students to demonstrate all the content descriptions. The lens which the teacher uses to demonstrate the content descriptions may be either guided through provision of electives within each unit or determined by the teacher when developing their program of learning.

A program of learning is what a college provides to implement the course for a subject. It is at the discretion of the teacher to emphasis some content descriptions over others. The teacher may teach additional (not listed) content provided it meets the specific unit goals. This will be informed by the student needs and interests.

Electives

For a standard 1.0 unit, a student must study a minimum of TWO electives from below.

For a half-standard 0.5 unit, a student must study a minimum of ONE elective from below.

Elective 1: Budgeting and Tenancy

Topics may include:

Budgeting

- major purchases – e.g. mobile phone, furniture, computers
- managing short term and long term personal finances
- use of spreadsheets e.g. excel
- preparing for personal financial independence
- understanding hidden costs of financial plans
- financial rights and responsibilities
- insurance
- individual projects with costing and research
- budgeting for personal interests:
    - hobbies
    - leisure and recreation activities
    - subscriptions to magazines, clubs and sporting events
    - music download costs

Tenancy

- accommodation costs
- costs of sharing accommodation and responsibilities
- accommodation types – e.g. alternative accommodations, government and preferential housing, emergency accommodation and support
- setup costs
- moving out
- contents insurance
- legal contracts
- utility bills
- social security support

Elective 2: Mathematics of Transport

Topics may include:

- cost of purchasing a car and motorbike
- cost of maintaining a car and motorbike
- documenting use of work vehicle, public transport
- motion, including accelerating, speed, braking distances
- blood alcohol level calculations
- transport statistics e.g. road accidents, drink driving etc.

Elective 3: Mathematics of Travel

Topics may include:

- holiday planning – domestic and international
- costing travel
- itineraries
- modes of travel e.g. boat, plane, hire car
- reading timetables for public transport
- finances associated with travel (transport, taxes, accommodation)
- distances
- scale and legends
- maps and charts
- 24h time, time zones and money conversions

Elective 4: Negotiated Study

A negotiated study unit has an important place in senior secondary courses. It is a valuable pedagogical approach that empowers students to make decisions about their own learning. A negotiated study unit is decided upon by a class, group(s) or individual student in consultation with the teacher and with the principal's approval. The program of learning for a negotiated study unit must meet all the content descriptions as appears in the unit.

The negotiated project of this unit must focus on the over-arching theme of moving out and moving on. Some suggestions are:

- my financial health – a personal case study
- paying off debt – what if I can't afford my credit card bill
- investigation into a variety of personal finance options
- planning your dream holiday
- health insurance

Assessment

Refer to pages 8-10.

Unit 4: Contemporary Mathematics — Value: 1.0

Unit 4a: Contemporary Mathematics — **Value: 0.5**

Unit 4b: Contemporary Mathematics — **Value: 0.5**

Unit Description

Students will study numeracy skills required for maintaining personal and supporting others' health. It includes, maths relating to nutrition, diet, medication and exercise.

Specific Unit Goals

This unit should enable students to:

A course	M course
• calculate the energy value of various foods and the energy needed for various activities • interpret graphs and statistics • collect and analyse mathematical data	• calculate the energy value of various foods and the energy needed for various activities • interpret graphs and tables • calculate basic statistics for data

Content Descriptions

All knowledge, understanding and skills below must be delivered:

A course	M course

• interprets and comprehends a range of everyday mathematical information that is embedded in familiar and routine texts
• interprets and comprehends:
  ○ whole numbers and familiar or routine fractions, decimals and percentages
  ○ familiar and routine measurement (for example, dates and time, including 24 hour times, 2D and 3D shapes, including pyramids and cylinders, length, mass, volume/capacity, temperature and simple area measures, maps and plans, data, tables, graphs and charts, and common chance events)
	• identifies and interprets simple mathematical information in familiar and simple oral instructions and written texts where the mathematics is partially embedded
	• identifies and interprets:
	  ○ whole numbers and simple fractions, decimals and percentages
	  ○ familiar and simple measurement (for example, dates and time, including 24 hour times, 2D and 3D shapes, including pyramids and cylinders, length, mass, volume/capacity, temperature and simple area measures, maps and plans

A course	M course

• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to:
  ○ select appropriate methods of solution from a limited range of mathematical processes
  ○ use developing estimation, and other assessment skills, to check and reflect on the outcome and its appropriateness to the context and task
	• draws on a combination of hands-on, in-context materials, personal experience, mathematical and other prior knowledge to:
	  ○ select appropriate methods of solution from a limited range of mathematical processes
	  ○ use developing estimation skills, to check and reflect on the outcome and its appropriateness to the context and task

• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate and uses calculator/technological processes and tools to undertake the problem solving process • selects and uses appropriate tools, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet	• uses a blend of personal 'in-the-head' methods and formal pen and paper methods to calculate and uses calculator/technological processes and tools to undertake the problem solving process • identifies and uses appropriate tools, hand-held devices, computers and technological processes, e.g. uses a tape measure to measure the dimensions of a window in mm or creates a personal weekly budget in a spreadsheet
• calculates with whole numbers and everyday or routine fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250 • uses and applies order of arithmetical operations to solve multi-step calculations • uses and applies rates in familiar or routine situations, e.g. km/hr, $/kg or $/m	• identifies and uses whole numbers and everyday or simple fractions, decimals and percentages, and where appropriate converting between equivalent forms (includes dividing by small whole numbers only, with division by decimal values and long division worked out on a calculator; calculations with simple fractions to be multiplication of whole number values only, e.g. 20% or 1/5 of $250 • uses and applies order of arithmetical operations to perform a limited range of calculations

A course	M course
• perform measurements, estimates and calculations using for example, 2D and 3D shapes, constructing common 3D shapes, length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using A = L x W, or estimates area of a non-rectangular shape by counting squares), distance, direction, coordinates, simple scales, labels, symbols and keys to read and use everyday maps and plans	• perform simple measurements, estimates and calculations using for example, 2D and 3D shapes, constructing some common 3D shapes, length, perimeter, mass, capacity/volume, time, temperature and simple area (for rectangular areas only, using A = L x W, or estimates area of a non-rectangular shape by counting squares), distance, direction, coordinates, simple scales, labels, symbols and keys to read familiar everyday maps and plans
• converts between routine metric units by applying understanding of common prefixes, e.g. milli, centi or kilo	
• collects and organises familiar data and constructs tables, graphs and charts, manually or with spreadsheets, using simple and familiar or routine scales and axes	• orders and uses familiar data to construct simple charts and tables on provided scales and axes
• describes, compares and interprets the likelihood of everyday chance events (e.g. rolling a six on a dice or the chance of rain) using qualitative terms such as certain, likely, impossible and relates these to everyday or routine fractions, decimals or percentages	
• uses a combination of both informal and formal written mathematical language and symbols and general language to document and report on the mathematical and problem solving process and results	• uses a combination of mainly informal and some formal written mathematical and general language to represent the mathematical and problem solving process
• uses a combination of both informal and formal oral mathematical and general language to present and discuss the mathematical and problem solving process and result	• uses a combination of mainly informal and some formal oral mathematical and general language to report on and discuss the mathematical and problem solving process
• uses a combination of both formal and informal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm	• uses a combination of mainly informal and some formal symbolism, diagrams, graphs and conventions relevant to the mathematical knowledge of the level, e.g. ○ 1/100, 12.5% ○ km/hr, $/kg ○ 1.25 m = 1250 mm

A guide to reading and delivering content descriptions

Content descriptions specify the knowledge, understanding and skills that students are expected to learn and that teachers are expected to teach. Teachers are required to develop a program of learning that allows students to demonstrate all the content descriptions. The lens which the teacher uses to demonstrate the content descriptions may be either guided through provision of electives within each unit or determined by the teacher when developing their program of learning.

A program of learning is what a college provides to implement the course for a subject. It is at the discretion of the teacher to emphasis some content descriptions over others. The teacher may teach additional (not listed) content provided it meets the specific unit goals. This will be informed by the student needs and interests.

Electives

For a standard 1.0 unit, a student must study a minimum of TWO electives from below.

For a half-standard 0.5 unit, a student must study a minimum of ONE elective from below.

Elective 1: Mathematics in Health

Topics may include:

- Fractions, decimals and percentages
- Food Labels/Food additives
- Diet and nutrition/daily food requirements
- Height and weight
- Kilojoules
- Fitness centres
- Scales
- Time and metric conversions
- Graphs, fitness statistics etc
- Medical centres
- Using formulae/dosages
- Transposition of formulae
- Child and maternal health
- Child health care centres
- Employment in health and fitness areas

Elective 2: Mathematics in Sport

Topics may include:

- gym membership
- fitness - assessment
- merchandising
- fields and equipment

- study of sport – dimensions, rules, regulations
- competition ladders and ranking e.g. soccer, football, rugby
- probability
- applications of chance
- dangers of gambling

Elective 3: Maths for Nursing and Aged Care

Topics may include:

This unit assumes students have access to:

Spencer, Andrew *A+National Pre-Accreditation Maths and Literacy for Nursing* Cengage Learning 2013

and/or

Spencer, Andrew *A+National Pre-Accreditation Maths and Literacy for Aged Care* Cengage Learning 2013

And/or other texts

- Review of basic literacy skills specifically for applications to nursing and aged care
- Review of basic numeracy skills without the use of a calculator, including integers, fraction and decimals, percentages, measurement conversions
- Calculation of IV rates, dosages, medicine mixtures, discounts, equipment costs
- Calculations of time and money costs, including the prioritising of tasks
- Reading skills required to read and understand a short report
- Writing skills required to write a short report.

Elective 4: Negotiated Study

A negotiated study unit has an important place in senior secondary courses. It is a valuable pedagogical approach that empowers students to make decisions about their own learning. A negotiated study unit is decided upon by a class, group(s) or individual student in consultation with the teacher and with the principal's approval. The program of learning for a negotiated study unit must meet all the content descriptions as appears in the unit.

Suggestions for the negotiated study may include:

- creating a fitness regime
- managing a sporting team.

Assessment

Refer to pages 8-10.

Appendix A – Implementation Guidelines

Available course patterns

A standard 1.0 value unit is delivered over at least 55 hours. To be awarded a course, students must complete at least the minimum units over the whole minor, major, major/minor or double major course.

Course	Number of standard units to meet course requirements
Minor	Minimum of 2 units
Major	Minimum of 3.5 units

Implementation Guidelines

The following table outlines the standard 1.0 units and electives in each unit.

	Unit 1: Contemporary Mathematics	Unit 2: Contemporary Mathematics	Unit 3: Contemporary Mathematics	Unit 4: Contemporary Mathematics
Electives	• Income and Payroll Maths • Workplace problem solving • Mathematics for Industry and VET • Negotiated Study	• Money Management • Banking and Financial Planning • Negotiated Project	• Budget and Tenancy • Mathematic s of Transport • Mathematics of Travel • Independent Mathematical Project	• Mathematics in Health • Mathematics in Sport • Maths for Nursing and Ageing • Negotiated Study

Prerequisites for the course or units within the course:

Nil.

Arrangements for students continuing study in this course

Students who studied the previous course may undertake any units in this course provided there is no duplication of content.

Units from other courses

Students who commence their studies in another BSSS accredited Mathematics course can count units from those courses towards a Contemporary Mathematics A/M major or minor.

Students cannot count any units from Contemporary Mathematics A/M towards a major or minor in a T course.

Duplication of Content Rules

Students cannot be given credit towards the requirements for a Senior Secondary Certificate for a unit that significantly duplicates content in a unit studied in another course. The responsibility for preventing undesirable overlap of content studied by a student rests with the principal and the teacher delivering the course. Students will only be given credit for covering the content once.

Guidelines for Delivery

Program of Learning

A program of learning is what a school provides to implement the course for a subject. This meets the requirements for context, scope and sequence set out in the Board endorsed course. Students follow programs of learning in a college as part of their senior secondary studies. The detail, design and layout of a program of learning are a college decision.

The program of learning must be documented to show the planned learning activities and experiences that meet the needs of particular groups of students, taking into account their interests, prior knowledge, abilities and backgrounds. The program of learning is a record of the learning experiences that enable students to achieve the knowledge, understanding and skills of the content descriptions. There is no requirement to submit a program of learning to the OBSSS for approval. The Principal will need to sign off at the end of Year 12 that courses have been delivered as accredited.

Content Descriptions

Are all content descriptions of equal importance? No. It depends on the focus of study. Teachers can customise their program of learning to meet their own students' needs, adding additional content descriptions if desired or emphasising some over others. A teacher must balance student needs with their responsibility to teach all content descriptions. It is mandatory that teachers address all content descriptions and that students engage with all content descriptions.

Half standard 0.5 units

Half standard units appear on the course adoption form but are not explicitly documented in courses. It is at the discretion of the college principal to split a standard 1.0 unit into two half standard 0.5 units. Colleges are required to adopt the half standard 0.5 units. However, colleges are not required to submit explicit documentation outlining their half standard 0.5 units to the BSSS. Colleges must assess students using the half standard 0.5 assessment task weightings outlined in the framework. It is the responsibility of the college principal to ensure that all content is delivered in units approved by the Board.

Moderation

Moderation is a system designed and implemented to:

- provide comparability in the system of school-based assessment
- form the basis for valid and reliable assessment in senior secondary schools
- involve the ACT Board of Senior Secondary Studies and colleges in cooperation and partnership
- maintain the quality of school-based assessment and the credibility, validity and acceptability of Board certificates.

Moderation commences within individual colleges. Teachers develop assessment programs and instruments, apply assessment criteria, and allocate Unit Grades, according to the relevant Framework. Teachers within course teaching groups conduct consensus discussions to moderate marking or grading of individual assessment instruments and Unit Grade decisions.

The Moderation Model

Moderation within the ACT encompasses structured, consensus-based peer review of Unit Grades for all accredited courses over two Moderation Days. In addition to Moderation Days, there is statistical moderation of course scores, including small group procedures, for T courses.

Moderation by Structured, Consensus-based Peer Review

Consensus-based peer review involves the review of student work against system wide criteria and standards and the validation of Unit Grades. This is done by matching student performance with the criteria and standards outlined in the Achievement Standards, as stated in the Framework. Advice is then given to colleges to assist teachers with, or confirm, their judgments. In addition, feedback is given on the construction of assessment instruments.

Preparation for Structured, Consensus-based Peer Review

Each year, teachers of Year 11 are asked to retain originals or copies of student work completed in Semester 2. Similarly, teachers of a Year 12 class should retain originals or copies of student work completed in Semester 1. Assessment and other documentation required by the Office of the Board of Senior Secondary Studies should also be kept. Year 11 work from Semester 2 of the previous year is presented for review at Moderation Day 1 in March, and Year 12 work from Semester 1 is presented for review at Moderation Day 2 in August.

In the lead up to Moderation Day, a College Course Presentation (comprised of a document folder and a set of student portfolios) is prepared for each A, T and M course/units offered by the school and is sent into the Office of the Board of Senior Secondary Studies.

The College Course Presentation

The package of materials (College Course Presentation) presented by a college for review on Moderation Days in each course area will comprise the following:

- a folder containing supporting documentation as requested by the Office of the Board through memoranda to colleges, including marking schemes and rubrics for each assessment item
- a set of student portfolios containing marked and/or graded written and non-written assessment responses and completed criteria and standards feedback forms. Evidence of all assessment responses on which the Unit Grade decision has been made is to be included in the student review portfolios.

Specific requirements for subject areas and types of evidence to be presented for each Moderation Day will be outlined by the Board Secretariat through the *Requirements for Moderation Memoranda* and Information Papers.

Visual evidence for judgements made about practical performances

It is a requirement that schools' judgements of standards to practical performances (A/T/M) be supported by visual evidence (still photos or video).

The photographic evidence submitted must be drawn from practical skills performed as part of the assessment process.

Teachers should consult the BSSS website for current information regarding all moderation requirements including subject specific and photographic evidence.

Appendix B – Course Developers

Name	**College**
Grant Mairs	Canberra College
Nicole Burg	Narrabundah College
Julie Rasmus	St Clare's College
Vivian Sabbagh	St Clare's College
Michael Klinkert	St Edmund's College
Frances Sargeant	St Edmund's College

Appendix C – Common Curriculum Elements

Common curriculum elements assist in the development of high-quality assessment tasks by encouraging breadth and depth and discrimination in levels of achievement.

Organisers	Elements	Examples
create, compose and apply	apply	ideas and procedures in unfamiliar situations, content and processes in non-routine settings
	compose	oral, written and multimodal texts, music, visual images, responses to complex topics, new outcomes
	represent	images, symbols or signs
	create	creative thinking to identify areas for change, growth and innovation, recognise opportunities, experiment to achieve innovative solutions, construct objects, imagine alternatives
	manipulate	images, text, data, points of view
analyse, synthesise and evaluate	justify	arguments, points of view, phenomena, choices
	hypothesise	statement/theory that can be tested by data
	extrapolate	trends, cause/effect, impact of a decision
	predict	data, trends, inferences
	evaluate	text, images, points of view, solutions, phenomenon, graphics
	test	validity of assumptions, ideas, procedures, strategies
	argue	trends, cause/effect, strengths and weaknesses
	reflect	on strengths and weaknesses
	synthesise	data and knowledge, points of view from several sources
	analyse	text, images, graphs, data, points of view
	examine	data, visual images, arguments, points of view
	investigate	issues, problems
organise, sequence and explain	sequence	text, data, relationships, arguments, patterns
	visualise	trends, futures, patterns, cause and effect
	compare/contrast	data, visual images, arguments, points of view
	discuss	issues, data, relationships, choices/options
	interpret	symbols, text, images, graphs
	explain	explicit/implicit assumptions, bias, themes/arguments, cause/effect, strengths/weaknesses
	translate	data, visual images, arguments, points of view
	assess	probabilities, choices/options
	select	main points, words, ideas in text
identify, summarise and plan	reproduce	information, data, words, images, graphics
	respond	data, visual images, arguments, points of view
	relate	events, processes, situations
	demonstrate	probabilities, choices/options
	describe	data, visual images, arguments, points of view
	plan	strategies, ideas in text, arguments
	classify	information, data, words, images
	identify	spatial relationships, patterns, interrelationships
	summarise	main points, words, ideas in text, review, draft and edit

Appendix D – Glossary of Verbs

Verbs	Definition
Analyse	Consider in detail for the purpose of finding meaning or relationships, and identifying patterns, similarities and differences
Apply	Use, utilise or employ in a particular situation
Argue	Give reasons for or against something
Assess	Make a Judgement about the value of
Classify	Arrange into named categories in order to sort, group or identify
Compare	Estimate, measure or note how things are similar or dissimilar
Compose	The activity that occurs when students produce written, spoken, or visual texts
Contrast	Compare in such a way as to emphasise differences
Create	Bring into existence, to originate
Critically analyse	Analysis that engages with criticism and existing debate on the issue
Demonstrate	Give a practical exhibition an explanation
Describe	Give an account of characteristics or features
Discuss	Talk or write about a topic, taking into account different issues or ideas
Evaluate	Examine and judge the merit or significance of something
Examine	Determine the nature or condition of
Explain	Provide additional information that demonstrates understanding of reasoning and /or application
Extrapolate	Infer from what is known
Hypothesise	Put forward a supposition or conjecture to account for certain facts and used as a basis for further investigation by which it may be proved or disproved
Identify	Recognise and name
Interpret	Draw meaning from
Investigate	Planning, inquiry into and drawing conclusions about
Justify	Show how argument or conclusion is right or reasonable
Manipulate	Adapt or change
Plan	Strategize, develop a series of steps, processes
Predict	Suggest what might happen in the future or as a consequence of something
Reflect	The thought process by which students develop an understanding and appreciation of their own learning. This process draws on both cognitive and affective experience
Relate	Tell or report about happenings, events or circumstances
Represent	Use words, images, symbols or signs to convey meaning
Reproduce	Copy or make close imitation
Respond	React to a person or text
Select	Choose in preference to another or others
Sequence	Arrange in order
Summarise	Give a brief statement of the main points
Synthesise	Combine elements (information/ideas/components) into a coherent whole
Test	Examine qualities or abilities
Translate	Express in another language or form, or in simpler terms
Visualise	The ability to decode, interpret, create, question, challenge and evaluate texts that communicate with visual images as well as, or rather than, words

Appendix E – Glossary for ACT Senior Secondary Curriculum

Courses will detail what teachers are expected to teach and students are expected to learn for year 11 and 12. They will describe the knowledge, understanding and skills that students will be expected to develop for each learning area across the years of schooling.

Learning areas are broad areas of the curriculum, including English, mathematics, science, the arts, languages, health and physical education.

A **subject** is a discrete area of study that is part of a learning area. There may be one or more subjects in a single learning area.

Frameworks are system documents for Years 11 and 12 which provide the basis for the development and accreditation of any course within a designated learning area. In addition, frameworks provide a common basis for assessment, moderation and reporting of student outcomes in courses based on the framework.

The **course** sets out the requirements for the implementation of a subject. Key elements of a course include the rationale, goals, content descriptions, assessment, and achievement standards as designated by the framework.

BSSS courses will be organised into units. A unit is a distinct focus of study within a course. A standard 1.0 unit is delivered for a minimum of 55 hours generally over one semester.

Core units are foundational units that provide students with the breadth of the subject.

Additional units are avenues of learning that cannot be provided for within the four core 1.0 standard units by an adjustment to the program of learning.

An **Independent Study unit** is a pedagogical approach that empowers students to make decisions about their own learning. Independent Study units can be proposed by a student and negotiated with their teacher but must meet the specific unit goals and content descriptions as they appear in the course.

An **elective** is a lens for demonstrating the content descriptions within a standard 1.0 or half standard 0.5 unit.

A **lens** is a particular focus or viewpoint within a broader study.

Content descriptions refer to the subject-based knowledge, understanding and skills to be taught and learned.

A **program of learning** is what a college develops to implement the course for a subject and to ensure that the content descriptions are taught and learned.

Achievement standards provide an indication of typical performance at five different levels (corresponding to grades A to E) following completion of study of senior secondary course content for units in a subject.

ACT senior secondary system **curriculum** comprises all BSSS approved courses of study.

Appendix F – ACSF Glossary

Term	Meaning
Abstract nouns	Refer to general concepts, qualities, feelings and ideas, e.g. freedom or honesty
Algebra	The part of maths that uses symbols or letters (called pro numerals) to stand for numbers, values or quantities, e.g. A = L x W
Algebraic representation	The conventions, symbols and letters used in writing algebraic sentences and formulae
Analogy	A similarity between like features of two things, on which a comparison may be based, e.g. the analogy between the heart and a pump
Autonomous learner	Independent learner with the willingness and capacity to take charge of own learning
AQF	Australian Qualifications Framework which is a single, 10 level coherent framework for the school, VET and higher education sectors in Australia
Chance events	An event or happening of which the outcome is uncertain, e.g. rolling a six with a die
Complex sentence	A sentence that contains one independent clause and one or more dependent clauses which are joined by words (subordinators) such as *because, since, although, when, who, which*
Compound sentence	A sentence that contains two independent clauses joined by a words (coordinators) such as *for, and, nor, but, or, yet, so*
Coordinates	A pair of numbers and/or letters that show the position of a point or place on a map or on a formal mathematical graph, e.g. D13, (3,5)
Core skills	The language, literacy and numeracy skills of Learning, Reading, Writing, Oral Communication and Numeracy
Critical reflection	The process of analysing, reconsidering and questioning experiences within a broad context of issues. Reflection observes to make meaning, whereas critical reflection is broader and deeper. It asks questions about, and relates meanings to, a spectrum of personal and professional issues.
Cursive	Is a form of running writing where successive letters in a word are joined together
Domains of Communication	These provide a way of describing the different orientations of social activity where LLN skills may be utilised, namely personal and community, workplace and employment, and education and training
Endnote	Software for managing and publishing bibliographies
Equivalent values	The values of a fraction, decimal or percentage that are equal in value, e.g. $^1/_2$= 0.5 = 50%
Explicit learning	A systematic instructional approach that includes a set of delivery and design procedures derived from effective schools research merged with behaviour analysis

Extrapolate	Extend the application of a method or conclusion, especially one based on statistics, to an unknown situation by assuming that existing trends will continue or similar methods will be applicable. Predict a trend, or use information to form an opinion or make recommendations
Focus Area	Each Indicator is broken up into different sections (Focus Areas), against which Performance Indicator statements are organised
ICT	Information and Communication Technology
Idiom	A phrase, construction or expression that is understood in a given language. This expression has a meaning that differs from typical syntactic patterns or that differs from the literal meaning of its parts taken together, e.g. to 'kick the bucket' means to die and to 'throw in the towel' means to give up or to stop
Implicit	Understood but not directly expressed; inherent in the nature of something
In-service	Training for those actively engaged in the profession or activity concerned
Indicators	Statements that describe performance at each level of the five core skills
Intonation	The pattern of pitch change in speech. The rise and fall of the voice
Inverse relationship	A mathematical relationship between two quantities where, if one quantity increases, the other decreases at the same rate
Irrational numbers	Numbers that cannot be written or expressed as a whole number or fraction, e.g. ϖ or $\sqrt{2}$
Learning modes/styles	The sensory channels through which individuals give, receive and store information. Includes visual, auditory, tactile/kinaesthetic, smell and taste
LLN	Language, literacy and numeracy
LLNP	Language, Literacy and Numeracy Program
Measures of central tendency	A value that is calculated to represent the middle or central value of a set of numbers or data - often referred to as the 'average'. The three common measures are the mean, median and mode
Measures of spread	A value that indicates how much a set of numbers or data is spread out or scattered. A common value used is the Range

Appendix G – Course Adoption

Conditions of Adoption

The course and units of this course are consistent with the philosophy and goals of the college and the adopting college has the human and physical resources to implement the course.

Adoption Process

Course adoption must be initiated electronically by an email from the principal or their nominated delegate to bssscertification@ed.act.edu.au. A nominated delegate must CC the principal.

The email will include the **Conditions of Adoption** statement above, and the table below adding the **College** name, and circling the **Classification/s** required.

College:	
Course Title:	**Contemporary Mathematics**
Classification/s:	**A M**
Accredited from:	2017
Framework:	Mathematics 2020