# Unit Outline

**Mathematics for Economics and Business**

<table>
<thead>
<tr>
<th><strong>Unit Number:</strong></th>
<th>EC205</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode of Study:</strong></td>
<td>Internal</td>
</tr>
<tr>
<td><strong>Credit:</strong></td>
<td>3 credit points</td>
</tr>
<tr>
<td><strong>Pre-requisites:</strong></td>
<td>At least three (3) 100-level business units</td>
</tr>
<tr>
<td><strong>Location:</strong></td>
<td>Sheridan College 18/7 Aberdeen St, Piccadilly Square West, Perth WA 6000</td>
</tr>
</tbody>
</table>
| **Student Workload:** | 168 hours (12 hours per week over 14 weeks)  
Seminars – 36 hours (3 hours per week over 12 teaching weeks)  
Private Study – 132 hours (9 hours per week over 12 teaching weeks + 12 hours per week over 2 non-teaching weeks) |
| **Learning Management System:** | Canvas (canvas.sheridan.edu.au) |
| **Unit Coordinator:** | Professor R. Sathiendrakumar | Phone: 9221-8170 |
| Email:              | rsathiendrakumar@sheridan.edu.au |
| **Course Coordinator:** | Mr Matthew Bambach | Phone: 9221-8170 |
| Email:              | mbambach@sheridan.edu.au |
Introduction
Welcome to Mathematics for Economics and Business. The unit focuses on six sections. Section 1 deals with basic techniques of mathematics needed for the later sections. Section 2 deals with the straight line, mathematical modelling and applications including demand, supply, cost and revenue, and the estimation of elasticity of demand, supply and income, and budget and cost constraints and their application to business and economics.

Section 3 deals with solving simultaneous liner equations, equilibrium and break-even analysis, and National income models. Section 4 deals with several non-linear functions that are frequently used in business and economics, such as quadratic, cubic and other polynomial functions, logarithmic functions and their applications.

Section 5 deals with differentiation confined to one independent variable only and its application such as marginal and average functions in business and economics. Section 6 deals with functions of several variables, because most of the business and economic models are usually functions of more than one variable. Therefore this section will cover partial differentiation and its application in business and economics, unconstrained optimization and constrained optimization including Lagrange multipliers.

Bachelor of Business Learning Outcomes
The Sheridan College Bachelor of Business has been accredited by the Tertiary Education Quality and Standards Agency (TEQSA) as meeting the standards set by the Australian Qualifications Framework (AQF).

Bachelor Degrees qualify individuals who apply a broad and coherent body of knowledge in a range of contexts to undertake professional work, and provide a pathway for further learning. Upon successful completion of the Bachelor of Business you (the student) will be able to:

- Demonstrate your understanding of a broad and coherent body of knowledge, with an emphasis on the underlying principles and concepts of one or more disciplines within the field of business.
- Exercise your cognitive skills successfully to critically analyse, synthesise and consolidate information, concepts and theories from multi-disciplinary perspectives.
- Critically evaluate the scholarship and professional practice of one or more disciplines within the field of business in the light of contemporary research, of workplace practice, and of perspectives grounded in Christian scholarship.
- Communicate your understanding of current knowledge and professional practice of one or more disciplines to others through structured assignments, projects and presentations in a variety of learning contexts.
- Demonstrate your intellectual independence through creative intellectual contributions to the study and/or practice of one or more disciplines within the field of business.
- Apply research-based knowledge, skills and concepts from one or more disciplines within the field of business to analyse problems and propose creative solutions across a diverse range of scenarios.
- Demonstrate your capacity to seek knowledge and truth with persistence, independence, rigour, and integrity.
- Evaluate the relevance of Christian faith and practice to the pursuit of knowledge in the field of business.
- Model self-discipline, ethical decision-making, servant leadership and respect for the dignity of individuals and groups in various settings.

Each unit you take in the Bachelor of Business program will contribute towards the fulfilment of these broader learning outcomes.
Mathematics for Economics and Business Learning Outcomes
Upon completion of this unit, students will be able to:

A. Apply quantitative methods to practical decision-making.
B. Utilise linear equations in analysing supply and demand issues and looking at simple macroeconomic models dealing with national income determination.
C. Examine differentiation, including the rates at which quantities change in order to appreciate the connection between the underlying mathematics and the economic applications.
D. Apply partial differentiation to a variety of applications including marginal functions elasticity’s and comparative statics.
E. Determine how to use integration to calculate consumer and producer surplus and the solution of first order differential equation.
F. Define how matrices and determinants are used to solve systems of linear equations, determination of equilibrium and input-output analysis.

Graduate Attributes
Study does more than equip you with knowledge in a specific academic field. It can also have a transformational effect on your own nature.

Moreland and Craig write:

“Study itself is a spiritual discipline, and the very act of study can change the self. One who undergoes the discipline of study lives through certain types of experiences where certain skills are developed through habitual study: framing an issue, solving problems, learning how to weigh evidence and eliminate irrelevant factors, cultivating the ability to see important distinctions instead of blurring them, and so on. The disciplines of study also aids in the development of certain virtues and values; for example, a desire for the truth, honesty with data, an openness to criticism, self-reflection and an ability to get along nondefensively with those who differ with one.”


The higher education sector in Australia describes these kinds of outcomes as “Graduate Attributes” (GAs). GAs don’t necessarily follow in a direct line from learning outcomes (LOs) but are shaped by the learning process itself. Sheridan College’s GAs, displayed in the table on the next page, are integrated into the College’s assessments and cultivated in all the College’s learning activities. They describe the kind of personal characteristics we hope you will exhibit when you graduate. If in future your referees use these kinds of descriptors when writing about you, we will consider this a sign of a successful higher education.
## Sheridan College Graduate Attributes

<table>
<thead>
<tr>
<th>College Vision Statement</th>
<th>College Graduate Attributes</th>
<th>Methods of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To offer higher education to those who are seeking to live an extraordinary life. To this end, the College will inspire its students to...</strong></td>
<td><strong>Sheridan College graduates will be...</strong></td>
<td><strong>See unit assessment schedule for alignment with specific assessments.</strong></td>
</tr>
</tbody>
</table>
| **... love truth...** | 1. Lovers of truth who: | - Assignments  
- Projects  
- Tests & Exams  
- Research  
- Academic Integrity Policy |
|  | a. Pursue knowledge, understanding and insight with persistence, independence, rigour, critical thinking and academic integrity. | |
|  | b. Attain a comprehensive understanding of the body of knowledge and professional skills within a specialised learning area or discipline. | |
|  | c. Identify and analyse the pre-theoretical assumptions that underpin the relevant theoretical frameworks and perspectives within a specialised learning area or discipline. | |
| **... seek wisdom...** | 2. Seekers of wisdom who: | - Assignments  
- Projects  
- Tests & Exams  
- Research  
- Academic Integrity Policy  
- Peer review |
|  | a. Recognise the limits of their knowledge and understanding, receiving and evaluating correction or advice with grace and humility. | |
|  | b. Exercise sound, fair and ethical judgment in study and workplace learning environments. | |
|  | c. Carefully consider their life’s purpose and make the most of opportunities as they emerge. | |
| **... embrace innovation...** | 3. Innovative thinkers who: | - Assignments  
- Projects  
- Tests & Exams  
- Research  
- Peer review |
|  | a. Identify research gaps and make original contributions that extend the body of knowledge, both independently and in collaboration with others. | |
|  | b. Synthesise, analyse and interpret information drawn from diverse sources using diverse mechanisms. | |
|  | c. Adapt effectively to changing circumstances, take appropriate risks, and solve problems in new situations. | |
| **... and become instruments of peace in the world.** | 4. Effective communicators who: | - Assignments  
- Projects  
- Tests & Exams  
- Research  
- Peer review |
|  | a. Demonstrate the ability to communicate clearly and effectively to a range of audiences and across a range of mediums/technologies. | |
|  | b. Build classmates and colleagues up according to their needs and for their benefit. Avoid slanderous speech. | |
|  | c. Promote respect, hospitality and understanding towards cultures and groups. | |
|  | a. Perform tasks to the best of their own abilities and strive for a high academic standard. | |
|  | b. Set reasonable goals, determine personal boundaries and drive set tasks to completion. | |
|  | c. Take responsibility for their own learning and research. | |
|  | a. Model respectful and ethical behaviour in team environments. | |
|  | b. Serve the local, national and global community. | |
|  | c. Understand and support Australian democratic traditions, including pluralism, freedom of speech, freedom of association, and equality of opportunity. | |
|  | a. Model respectful and ethical behaviour in team environments. | |
|  | b. Serve the local, national and global community. | |
|  | c. Understand and support Australian democratic traditions, including pluralism, freedom of speech, freedom of association, and equality of opportunity. | |
Course Structure

Academic Calendar
Bachelor Degrees are 3-year programs at Sheridan College. Units are delivered in 15-week trimesters. Each trimester comprises 12 weeks of teaching, two non-teaching study weeks, and an examination week.

Trimesters 1 and 3 are dedicated coursework trimesters. If you are enrolled full-time, you will take 3-4 core or elective units during this trimester.

Trimester 2 is a dedicated research trimester. Whether you are enrolled full-time or part-time, your only formal study during Trimester 2 will be a single research-related unit relevant to your field of study. The schedule provides a focused opportunity to acquire valuable research skills, and to practise applying those skills under the direction of the College faculty.

The Trimester 2 schedule also offers you some freedom to pursue personal, professional and learning goals outside of your formal coursework. The College provides a range of informal extra-curricular programs during this trimester for you to gain life experience and enhance your employability. A description of these programs can be found on the College website at http://sheridan.edu.au/index.php/home/academic-calendar.

The table below provides an example of a standard academic program for the Bachelor of Business.

<table>
<thead>
<tr>
<th>SAMPLE B.BUS. PROGRAM</th>
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<tbody>
<tr>
<td><strong>PRE-TRIMESTER</strong></td>
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<tr>
<td><strong>YEAR 1</strong></td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>YEAR 2</strong></td>
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<tr>
<td><strong>YEAR 3</strong></td>
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<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
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Seminars
You will meet with the instructors for one 3-hour session each week. Please arrive with a willingness to learn, reflect and contribute to class discussions. It is essential that you prepare thoroughly for each class by reading the assigned chapters and/or journal articles.
Private Study Expectations
You should expect to spend an additional nine (9) hours per week of private study, immersing yourself in the course material and completing the assessment requirements. Reading and preparation for each course week should be done prior to or during the early part of each course week. Students may choose to begin reading over the weekend prior to each course week, keeping a notebook of insights and questions to contribute during the week’s discussion.

Consultation
At Sheridan College, instructors make themselves available during office hours for individual consultations for a minimum of 25% of the total time spent teaching the unit. For this unit, the instructor will nominate an additional one (1) hour either before or after class to be available for individual student queries. The specific times will be set after discussions with the class on the first day.

IT Resources
The internet is an extraordinary resource for students and using it effectively contributes to the nurturing of the College’s graduate attributes in each student. We encourage you to bring your electronic devices (college-supplied or personal tablets, mobile phones, laptops) into the class as a learning resource. As a courtesy to your classmates, please keep these learning devices on “silent” and do not take phone calls during class hours.

Wireless internet access will be available for all students at the Piccadilly Square West campus, if you wish to meet there in study groups or for private study. You can also access printers, scanners and photocopiers at the office.

Location
The unit will be taught at Suite 18, 7 Aberdeen Street, Perth WA 6000

Time: TBA
Room: TBA

Learning Resources

Prescribed Text

Supplementary Reading(s)
You may find some of the texts listed below useful for additional explanation and for assistance in writing essays. Copies of these texts have been placed in the Reserve Section of the Sheridan College Library.


Read widely to increase your understanding e.g.
- Financial review,
- Economist,
- other daily or weekly newspapers and magazines.

**College Library Resources**

In 2017, Sheridan College students will have direct access to four (4) major academic database collection providers, granting Sheridan College students direct onsite (IP) and remote access to:

1. *Academic OneFile* from Cengage Gale (now active)
2. *Oxford University Press Arts and Humanities Collection* (now active)
3. *EBSCO collections* (to be activated from 1 February 2017), including:
   - Business Source Premier
   - Academic Search Premier
   - Humanities International Complete
   - Science and Technology Collection
4. *Informit collections* (to be activated from 1 February 2017), including:
   - Business Collection
   - HSS Collection

**Cunningham Library**

Sheridan College is an institutional member of the *Australian Council of Educational Research’s Cunningham Library*.

Cunningham Library is a unique, comprehensive collection of Australian educational research material dating from the early 1900s to the present day. The vast resources of Cunningham Library offer the researcher a complete and up to date collection of educational research documents in Australia, including:

- books with over 50,000 titles, both Australian and overseas publications
- journals with over 400 titles, both Australian and overseas publications
- e-journals
- government reports & conference proceedings
- bibliographic database of educational theses
- audio, video & CD-ROM material
- educational and psychological tests
- databases, directories and research discovery tools
- web documents & e-books


Aberdeen Street Campus Reserve Collection
A growing physical reserve library of books will be maintained at the Aberdeen St campus for resources specifically chosen by lecturers for individual units. These resources will be nominated by the lecturers and purchased if there are no online options available.

Public Libraries
You will have signed up with the State Library of WA (SLWA) and the National Library of Australia (NLA) when you enrolled at Sheridan College. It takes about one week from the date of enrolment for your subscription to SLWA to become active.

The e-resources of SLWA and NLA are available online for library members (free to members of the public with an Australian residential address), including thousands of peer-reviewed journals across the full range of academic disciplines. For business these include:

- Business Advisors Guide
- EBL (EBook Library)
- EconLit
- Informit Business Collection
- Academic Search Premier
- Business Source Premier
- EBSCO
- Emerald Journals
- GIBLIN: Glibin Working Papers
- IBIS World
- MasterFile Premier
- MEDGE: Management and Environment Information
- Regional Business Books

Other Free Resources
Access to free full-text journals can also be found through the following sites, among many others:

- VOCEDplus (www.voced.edu.au/journalbrowse)
- Stanford University’s Highwire site (http://highwire.stanford.edu/lists/freeart.dtl)
- Directory of Open Access Journals (http://www.doaj.org/)
- Open Directory Project (http://www.dmoz.org/Reference/Education/Journals)

Community Memberships
If those are insufficient for research purposes, community memberships are also available at Perth higher education institutions. Research students wishing to join the libraries of Perth’s universities will be fully reimbursed by Sheridan College for their membership costs.

Community memberships are available at the following university and other higher education libraries:

- Edith Cowan University: $88 ($22 with concession)
• Curtin University: ($70.40) https://library.curtin.edu.au/borrowing/non-curtin-borrowers/community-borrowers.cfm
• Murdoch University: ($99) http://library.murdoch.edu.au/Our-services/Community-members/
• University of Notre Dame ($40) http://library.nd.edu.au/content.php?pid=50125&sid=642804
• UWA http://www.is.uwa.edu.au/about/visitors-friends/visitors#community
• Vose Seminary ($50) http://www.vose.edu.au/view/library/joiningthelibrary/

Please note: For some universities, community members may only be able to access online resources while logging in from a terminal within the university library itself.

Learning Support
Any student who feels they may need special provisions for any type of disability should see an instructor during regular office hours or contact the Registrar, Mrs Christa Smith, who will help you make any necessary accommodations for academic support.

Assessment Schedule

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Value</th>
<th>Due Date</th>
<th>LOs Assessed</th>
<th>GAs Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical Assignments</td>
<td>30%</td>
<td>Weeks 2 to 4</td>
<td>A,B,C</td>
<td>1,2</td>
</tr>
<tr>
<td>Mid Trimester Test</td>
<td>30%</td>
<td>Week 8</td>
<td>A,B,C,D</td>
<td>1,2</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
<td>Week 13</td>
<td>A,B,C,D,E,F</td>
<td>1,2</td>
</tr>
</tbody>
</table>

Explanation of Assessments
Sheridan College assessments are designed both to measure your successful demonstration of the full range of learning outcomes within the unit, and to cultivate the Sheridan College graduate attributes.

You must submit all assessments in order to satisfy the unit requirements.

1. Practical Assignments
This assignment focuses on utilizing the tools that are available to quantitatively analyse business and economic situations.

Students will be given three practical assignments to complete over the first three weeks on the area of supply and demand, elasticity, and differentiating functions.

All three practical assignments will have equal weight and the students are expected to submit all assignments. The overall mark will be worth 30% of the final marks for this unit.

2. Mid Term Test
A one and a half-hour closed book examination comprising problems from material learned to date. The exam will include practical as well as situational questions.

All questions carry equal weight and students are expected to answer all questions. The overall mark will be worth 30% of the final marks for this unit.

3. Final Exam
A three hour closed book examination requiring students to analyse economic and business situations utilising quantitative material learned in the unit.
All questions carry equal weight and the students are expected to answer all questions. The overall mark will be worth 40% of the final marks for this unit.
Guidelines for Written Assignments
These general guidelines will assist you in preparing and writing your assignments. Your instructor will discuss these in greater detail before you commence your assignment. If you have any questions please ask your instructor to assist you. Do not ask other students, as they may not give you the correct information.

Presentation
- The assignment must be typed on A4 paper with 1.5 or 2-line spacing and a 3cm margin at the top, bottom and right hand side to allow for marker's comments. Headings should be used to identify the main points in your discussion and may be underlined.
- Your assignment should be grammatically correct and well punctuated. A high standard of written English is expected and your assignments should be clear, concise, neatly presented and easy to read. Failure to comply with these requirements may result in a significant loss of marks.

Academic Integrity
- Your assignment must be your own original piece of work and not that of another student or previously submitted work for another subject. Please be aware that there are serious penalties for handing in assignments that have been copied from another source (plagiarism). Your lecturer will discuss this with you during your class. Please note also that Sheridan College deploys plagiarism-detection mechanisms. The Sheridan College Academic Integrity Policy is found at http://sheridan.edu.au/index.php/home/policy-library.
- You are expected to acknowledge the source of your ideas and expressions used in your written work. Students at Sheridan College are required to use the APA Referencing style. A guide to using the APA Referencing Style is posted on Canvas.

Submission
- Your assignment should be submitted to your instructor by the date specified. If you require an extension of time, it is your responsibility to contact your lecturer before the due date, and provide documentation from a medical practitioner, or the student counsellor as to why you cannot adhere to the stated due date.
- Any assignment submitted after the due date without the instructor’s permission will be subject to a deduction of 10% of the original mark for each working day (including weekends) for which it is late. Assignments submitted more than one week late will only be accepted with a current medical certificate, which must be dated on the day of the illness.
- You must keep a copy of the completed assignment when you submit the original document for marking.
- If you are in doubt about any of these requirements, you should discuss them with your instructor who will clarify any misunderstanding.
- All assignments must be submitted to assignments@sheridan.edu.au.

Assessment Moderation
- Your major assessment may also be marked by an external examiner, in addition to your instructor. This is common practice in higher education and is designed to ensure that your marks are equivalent to students being assessed at other higher education institutions.
<table>
<thead>
<tr>
<th>WEEK NO.</th>
<th>TOPICS COVERED</th>
<th>READINGS</th>
<th>ASSESSMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Welcome, Unit Outline and Structure; Administration Procedures; Discussion on Assessments; Assignment dates agreed Topic 1: Fundamental Techniques</td>
<td>Bradley Chapter 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Topic 2: Straight Line and Applications</td>
<td>Bradley Chapter 2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Topic 2 continued: Straight Line and Applications continued</td>
<td>Bradley Chapter 2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Topic 3: Simultaneous Equations</td>
<td>Bradley Chapter 3</td>
<td></td>
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<tr>
<td></td>
<td><strong>In-Trimester Study Week</strong></td>
<td></td>
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<tr>
<td>5</td>
<td>Topic 3 continued: Simultaneous Equations continued</td>
<td>Bradley Chapter 3</td>
<td>All three practical assignments due (30%)</td>
</tr>
<tr>
<td>6</td>
<td>Topic 4: Non-linear Functions and Applications</td>
<td>Bradley Chapter 4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Topic 4 continued: Non-linear Functions and Applications continued</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Mid Trimester Test</td>
<td>Bradley chapters 1 to 4</td>
<td>Mid Trimester Test: Topics 1 – 4 (30%)</td>
</tr>
<tr>
<td>9</td>
<td>Topic 5: Differentiation and Applications</td>
<td>Bradley Chapter 6</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Topic 5 continued: Differentiation and Applications continued</td>
<td>Bradley Chapter 6</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Topic 6: Functions of Several Variables</td>
<td>Bradley Chapter 7</td>
<td></td>
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<tr>
<td>12</td>
<td>Review</td>
<td>Topics 1 to 7</td>
<td></td>
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<tr>
<td></td>
<td><strong>Pre-Exam Study Week</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Examination</td>
<td>Bradley chapters 1, 2, 3, 4, 6, and 7</td>
<td>Final Examination Topics 1 to 7 (40%)</td>
</tr>
</tbody>
</table>

*Bradley* chapter 7 includes all topics on Functions of Several Variables.