DONGGUAN UNIVERSITY OF TECHNOLOGY

School of Economics and Management

Course Syllabus

Fall 2017

Instructor Information

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| Instructor | Chih-Yuan Hung |
| E-mail | chihyuanhung@qq.com |
| Phone | 18826831242; 77527 |
| WeChat/QQ | josephCYHung/1307455914 |
| Office | 2303 Guancheng Campus |
| Office Hours | Tuesday 10:30-12:10; By Appt. |

Student Information

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| Entry Year | 2017 |
| Level | Undergraduate |
| Major | Economics and Finance (Financial Management Industry-University International Program) |

Course Information

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| Course Code | 044619 |
| Course Title | Advanced Mathematics B (I) |
| Course Category | Compulsory ☐Elective |
| Credit(s) | 3 |
| Total Hours | 48 |
| Hours per week | 3 |
| Practical Hours | None |
| Lab Practice Hours | None |
| Classroom | 2410 Guancheng Campus |
| Time | Tuesday, 08:30-10:10; Thursday, 08:30-10:10 |
| Required Textbook | Stewart, James. *Calculus* *(7th Edition)*. Cengage Learning, 2012; Higher Education Press, 2014. |
| Supplementary Materials | Courant, Richard & John, Fritz. *Introduction to Calculus and Analysis I*, Pearson, 2008. |
| Prerequisites | High school algebra |

Assessment and Grading

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| Assignments | Percent of Final Grade |
| Attendance | 12% |
| Test/ Problem set | 18% |
| Midterm | 30% |
| Final | 40% |
| Total | 100% |

Course Description

The Advanced Mathematics B (I) is an introductory course for Calculus, which covers differentiation and integration of functions of one variable, with applications. Topics include:

* + Concepts of Function, Limits, and Continuity
  + Differentiation Rules, Application to Graphing, Rates, Approximations, Extreme Problems, and L'Hôspital's Rule
  + Definite and Indefinite Integration
  + Fundamental Theorem of Calculus
  + Applications of Integration

Course Objectives

* Use both the limit definition and rules of differentiation to differentiate functions.
* Sketch the graph of a function using asymptotes, critical points, the derivative test for increasing/decreasing functions, and concavity.
* Apply differentiation to solve applied max/min problems.
* Apply differentiation to solve related rates problems.
* Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
* Apply integration to compute arc lengths, volumes of revolution and surface areas of revolution.
* Use L'Hospital's rule to evaluate certain indefinite forms.

Course Expectations

Students should expect to spend several hours per week on this course. To succeed, you must read textbook carefully, doing exercises in the end of every sections as many as you can, engage in class discussion and lecture, and outline and summarize the course materials in your own note taking system. This will require a time commitment from you, one that may exceed 10 hours of work per week in addition to studying for exams. At a minimum, students should read the textbook, attend class lectures, complete the assigned homework, complete all exams, and ask questions.

Course Schedule

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| Week/Date | Topic | Required Reading and Assignments |
| 1/Sep. 26, 28, 30 | Diagnostic Tests  A Preview of Calculus  Functions and Models | Preface/ To the Student  A Preview of Calculus  Exercise 1.1~1.4 |
| 2/Oct. 10，12 | Exponential Functions and Inverse Functions.  The Tangent and Velocity Problems | Exercise 1.5, 1.6 and 2.1  Principles of problem Solving |
| 3/Oct. 17, 19 | Limit of a Function  Continuity | Exercise 2.2~2.6 |
| 4/Oct. 24, 26 | Derivatives and Rates of Change  Test 1(Oct. 26) | Exercise 2.7, 2.8 and Problems plus |
| 5/Oct. 31, Nov. 2 | Differentiation Rules | Exercise 3.1~3.4 |
| 6/Nov. 7, 9 | Implicit Differentiation  Related Rates and Linear Approximation | Exercise 3.5~3.11 and Problem Plus |
| 7/Nov. 14, 16 | Midterm exam(Nov. 14)  Extreme Value Problem | Exercise 4.1 |
| 8/Nov. 21, 23 | The Mean Value Theorem  L’Haspital’s Rule  Graphing with Calculus | Exercise 4.2~4.6 |
| 9/Nov. 28, 30 | Optimization Problems  Newton’s Method | Exercise 4.7~4.0 and Problem Plus |
| 10/ Dec. 5, 7 | Test 2(Dec. 5)  The Definite Integral | Exercise 5.1~5.3 |
| 11/Dec. 12, 14 | The fundamental Theorem of Calculus  Indefinite Integrals | Exercise 5.4, 5.5 and Problem Plus |
| 12/Dec. 19, 21 | Test 3(Dec. 19)  Applications of Integration | Selected problems in Exercise 6.1~6.5 |
| Date:  Reviewed by  Signature  Director of  Department of International Business and Management | | |