MA-211 CALCULUS II (4)

Fall 2018 08/20 – 11/30/2018

MA 211-02: MWF 9:30 – 10:20AM, & T 8:30 - 9:20AM,

MA 211-01: TTH 10:00 – 11:20AM, & M 1:30 - 2:20PM, **HHOA 102**

INSTRUCTOR: DR. CHOCK Y. WONG

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Office Hours: MW: 11:30am – 12:30pm; TTH: 11:30am – 1:00pm; or by appointments.

Course Description: This course is the continuation of MA-210. It will mainly cover the differentiation and integration of transcendental functions (exponential, logarithmic, and inverse trigonometric functions), and more advanced techniques of integration. It will also discuss topics in sequences and series, limits of sequences, the L'Hospital's rule, convergence and divergence of series, Taylor series and power series.

Prerequisites: Calculus I (MA210) or equivalent.

Text Book: Larson/Edwards: **CALCULUS Of A Single Variable** (10th edition). ISBN 0-547-20998-3.

Learning Outcomes: By taking this course, the student will

(1) gain understanding of more transcendental functions (logarithmic functions, exponential functions, inverse trigonometric functions): their differentiation and integration;

(2) acquire basic knowledge of differential equations that apply to growth and decay, and logistic models;

(3) develop advanced skills in integration (integration by parts, trigonometric substitution, and partial fractions) and limit evaluation (L'Hospital's rule);

(4) develop skills to solve applied problems (in physics and geometry) using integration;

(5) gain understanding of the concepts of sequences and series;

(6) develop skills to test the convergence of series and represent functions by power series.

These learning outcomes are directly linked to the Program Learning Outcomes, especially in terms of

• to demonstrate the understanding and skills in reading, interpreting and communicating mathematical contents which are integrated into other disciplines or appear in everyday life

• to articulate the understanding of more advanced mathematical concepts and computational skills to support the study of other disciplines, including skills with numeric, analytic and graphic methods

• to develop mathematical maturity to undertake higher-level studies in mathematics and related fields.

Topics & Tentative Schedule:

Chapter 5, 6, 7, 8, and 9 will be covered. Main topics include:

(1) The transcendental functions: Their derivatives and integrals. (Ch.5)
   (i) The natural logarithmic function. Week 1 — Week 2
   (ii) Exponential functions. Week 3 — Week 4
   (iii) Inverse trigonometric functions. Week 4 — Week 6

(2) Differential equations. (Ch.6: selected sections)
   Week 6 — Week 7

(3) More techniques of integration; L'Hospital's rule. (Ch.8)
   (i) Integration by parts. Week 8
   (ii) Trigonometric integrals. Week 9
   (iii) Trigonometric substitution. Week 10
   (iv) Partial fractions. Week 11
   (v) L'Hospital's rule. Week 12

(4) Applications of the integral: Area, volume, and work problems. (Ch.7)
   Week 13 — Week 14

(5) Infinite series: Convergence, Taylor series, Power series. (Ch.9: selected sections)
   Week 14 — Week 15

Attendance & Class Participation Each student should do his/her best to attend **every single class including the 4th hour** (be aware that the 4th hour is not something "extra" but an regular part of the class as the other 3 hours), avoid missing any class except in "special" cases (illness or other approved academic/athletic activities). Due to the fast pace and academic level of the class, one single class missing may cause you many hours to make it up on your own and drag your progress for one to two weeks (or even longer). I may withdraw you from class if you would miss classes for three weeks accumulatively.

The basic format of this class is "**less talk (by instructor), more practice (by students)**". You need to actively participate in all class activities, but not only listening and notes-taking. Be aware that the most important part of your learning process occurs **in class**, especially for content-and-skill-rich courses such as Calculus. Thus, be ready, learn every new topic ($70^+\%$ of it) **in class** — and believe you can do that!

Strongly suggest to have a binder exclusively for this class, to well organize your class notes and handout materials from class.

Homework: Selected odd numbered problems from the textbook will be assigned either as **on-your-own** exercises or as homework to turn in — it will be indicated by handout homework worksheets. It is important for you to work through the assignments (both from textbook and worksheets) on time so that you can grasp the Calculus II concepts and skills in a timely manner and keep up with the progress of the course. **Grading penalty will apply to late papers.** You are encouraged to seek help from mathematics tutoring web sites (one good suggestion: www.WolframAlpha.com) and form study groups to help each other.

Calculators/Cellular Phones/Electronic Devices: A scientific calculator is required in class and is allowed in all quizzes and exams; graphic calculators are helpful, but not required. **Please note that cellular phones, computers (laptops, notebooks, penal PC's) and any kind of wireless devices are not allowed to be used in all quizzes and exams.** Also, according to the CUH Student Handbook, the use of cellular, wireless and other mobile telephones while in class is prohibited; emergency calls shall be engaged in outside of the classroom; and according to the NS&M Division's policy, use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes.

Quizzes and Exams:

There will be **9 quizzes** as described below (dates and more details wil be announced in advance):

QUIZ	Sections to Cover	DATE
QUIZ 0	MA210 Review	Week 1
QUIZ 1	§5.1	Week 2
QUIZ 2	§5.2	Week 4
QUIZ 3	§§5.4, 5.5	Week 5
QUIZ 4	§§5.6, 5.7	Week 7
QUIZ 5	TBA	Week 9
QUIZ 6	§8.2	Week 10
QUIZ 7	§8.4	Week 12
QUIZ 8	§§8.5, 8.7	Week 14

Please note that **No** make-up quiz will be allowed except for school events (sport/conference) or medical reasons with supporting documentation and timely notice (e.g., by emails).

A **Mid-term exam** will be on Week 9 (10/15 – 10/19), to cover Chapter 5 and 6.

The **Final Exam** will be accumulative, and in closed/open book format.

Grading: (subject to changes)

ATTENDANCE:	5% of the total	**A:**	90 – 100%
HOMEWORK:	30% of the total	**B:**	80 – 89%
QUIZZES:	20% of the total	**C:**	70 – 79%
Mid-term EXAM:	15% of the total	**D:**	60 – 69%
FINAL EXAM:	30% of the total	**F:**	below 60%