KINGSBOROUGH COMMUNITY COLLEGE
The City University of New York

CURRICULUM TRANSMITTAL COVER PAGE

Department: Math and Computer Science Date: 2/21/2018

Title Of Course Or Degree: Calculus II - MAT 1600

Change(s) Initiated: (Please check)

- ☐ Closing of Degree
- ☐ Closing of Certificate
- ☐ New Certificate Proposal
- ☐ New Degree Proposal
- ☐ New Course
- ☐ New 82 Course
- ☐ Deletion of Course
- ☐ Change in Degree or Certificate Requirements
- ☐ Change in Degree Requirements (adding concentration)
- ☐ Change in Pre/Co-Requisite
- ☐ Change in Course Designation
- ☐ Change in Course Description
- ☑ Change in Course Title, Numbers Credit and/or Hour
- ☐ Change in Academic Policy
- ☐ Pathways Submission:
  - ☐ Life and Physical Science
  - ☐ Math and Quantitative Reasoning
  - ☐ A. World Cultures and Global Issues
  - ☐ B. U.S. Experience in its Diversity
  - ☐ C. Creative Expression
  - ☐ D. Individual and Society
  - ☐ E. Scientific World

☐ Other (please describe): _____

PLEASE ATTACH MATERIAL TO ILLUSTRATE AND EXPLAIN ALL CHANGES

DEPARTMENTAL ACTION

Action by Department and/or Departmental Committee, if required:

Date Approved: 2/21/2018 Signature, Committee Chairperson: _____

I have reviewed the attached material/proposal

Signature, Department Chairperson: R Yacob

Revised Dec. 2015 AK

KINGSBOROUGH
COMMUNITY COLLEGE
★ DREAMS BEGIN HERE ★

TO: Spring 2018 Curriculum Committee

FROM: Department of Mathematics & Computer Science

DATE: 2/21/2018

RE: Change in Number of Course Credits to Calculus II (MAT 1600)

The Department of Mathematics & Computer Science is proposing a change in number of course credits for Calculus II (MAT 1600).

FROM:

4 credits, 4 hrs

TO:

3 credits, 4 hrs. (2 lecture hrs., 2 hr. lab)

Rationale for Change: The change in number of credits reflects curricular adjustments.

KINGSBOROUGH COMMUNITY COLLEGE
THE CITY UNIVERSITY OF NEW YORK

COURSE SYLLABUS: Mathematics 1600

1. **DEPARTMENT, COURSE NUMBER, AND TITLE:**
   Department of Mathematics and Computer Science
   Mathematics 1600- Calculus II

2. **DOES THIS COURSE MEET A GENERAL EDUCATION/CUNY CORE CATEGORY? YES**
   - ☐ **Life and Physical Science**
   - ☒ **Math and Quantitative Reasoning**
   - ☐ **A. World Cultures and Global Issues**
   - ☐ **B. U.S. Experience in its Diversity**
   - ☐ **C. Creative Expression**
   - ☐ **D. Individual and Society**
   - ☒ **E. Scientific World**

   IF YES, COMPLETE AND SUBMIT WITH THIS PROPOSAL A CUNY COMMON CORE SUBMISSION FORM.

3. **DESCRIBE HOW THIS COURSE TRANSFERS (REQUIRED FOR A.S. DEGREE COURSE). IF A.A.S. DEGREE COURSE AND DOES NOT TRANSFER, JUSTIFY ROLE OF COURSE, E.G. DESCRIBE OTHER LEARNING OBJECTIVES MET:**
   Brooklyn College: Calculus II, 4 credits
   Queens College: Calculus, 4 credits
   Lehman College: Calculus II, 4 credits
   College of Staten Island: Analytic Geometry and Calculus II, 3 credits
   New York City Technical College: Analytic Geometry and Calculus II, 4credits
   York College: Analytic Geometry and Calculus II, 4 credits
   John Jay College of Criminal Justice: Calculus II, 3 credits

4. **BULLETIN DESCRIPTION OF COURSE:**
   A second course in the calculus of functions of one variable. Integrals, area, volume, and arc length; physical applications; exponential and logarithmic functions and applications; L'Hospital's rule; trigonometric and inverse trigonometric functions; integration techniques.

5. **CREDITS AND HOURS* (PLEASE CHECK ONE APPROPRIATE BOX BELOW BASED ON CREDITS):**

1-credit:	☐ 1 hour lecture ☐ 2 hours lab/field/gym
2-credits:	☐ 2 hours lecture ☐ 1 hour lecture, 2 hours lab/field ☐ 4 hours lab/field
3-credits:	☐ 3 hours lecture ☐ 3 hours lecture, 1 hour recitation ☒ 2 hours lecture, 2 hours lab/field ☐ 1 hour lecture, 4 hours lab/field ☐ 6 hours lab/field
4-credits:	☐ 4 hours lecture ☐ 3 hours lecture, 2 hours lab/field ☐ 2 hours lecture, 4 hours lab/field ☐ 1 hour lecture, 6 hours lab/field ☐ 8 hours lab/field
More than 4-credits:	☐ Number of credits: ____ (explain mix lecture/lab below) ___ Lecture ____Lab Explanation:_____

***Hours are hours per week in a typical 12-week semester**

6. **NUMBER OF EQUATED CREDITS IN ITEM #5:** N/A

7. **COURSE PREREQUISITES AND COREQUISITES (IF NONE PLEASE INDICATE FOR EACH)**
   - **A. PREREQUISITE(S):** MAT 1500
   - **B. COREQUISITE(S):** NONE
   - **C. PRE/COREQUISITE(S):** NONE

8. **BRIEF RATIONALE TO JUSTIFY PROPOSED COURSE TO INCLUDE:**
   - **A. ENROLLMENT SUMMARY IF PREVIOUSLY OFFERED AS AN 82 (INCLUDE COMPLETE 4-DIGIT 82 COURSE NUMBER)**
   - **B. PROJECTED ENROLLMENT:** MAT 1600 will have an enrollment of approximately 100
   - **C. SUGGESTED CLASS LIMITS:** 35
   - **D. FREQUENCY COURSE IS LIKELY TO BE OFFERED:** Fall and Spring
   - **E. ROLE OF COURSE IN DEPARTMENT'S CURRICULUM AND COLLEGE'S MISSION**

   MAT 1600 is an essential tool for the study of Computer Science, Economics, Engineering, Mathematics, Physics, Chemistry, and Biology

9. **LIST COURSE(S), IF ANY, TO BE WITHDRAWN WHEN COURSE IS ADOPTED (NOTE THIS IS NOT THE SAME AS DELETING A COURSE):** N/A

10. **IF COURSE IS AN INTERNSHIP, INDEPENDENT STUDY, OR THE LIKE, PROVIDE AN EXPLANATION**

AS TO HOW THE STUDENT WILL EARN THE CREDITS AWARDED. THE CREDITS AWARDED SHOULD BE CONSISTENT WITH STUDENT EFFORTS REQUIRED IN A TRADITIONAL CLASSROOM SETTING: N/A

11. PROPOSED TEXT BOOK(S) AND/OR OTHER REQUIRED INSTRUCTIONAL MATERIAL(S):

Calculus (Alternate 6th edition) by Larson, Hostetler, & Edwards
(Houghton-Mifflin, 1998), plus Study Guide ISBN # 0395889022

12. REQUIRED COURSE FOR MAJOR OR AREA OF CONCENTRATION?
Computer Science, Engineering, and Mathematics

13. IF OPEN ONLY TO SELECTED STUDENTS SPECIFY POPULATION:
MAT 1600 is open to all students who meet the prerequisites

14. EXPLAIN WHAT STUDENTS WILL KNOW AND BE ABLE TO DO UPON COMPLETION OF COURSE:

a. understand and differentiate exponential, logarithmic and trigonometric functions.
b. understand and calculate definite and indefinite integrals of rational, exponential, logarithmic and trigonometric functions.
c. understand and calculate the area between two curves.
d. understand and calculate volume by the disk and shell methods.
e. understand and calculate arc length.
f. understand and calculate work.
g. understand and solve problems in exponential growth and decay.
h. understand and calculate limits using L=Hospital=s rule.
i. use integral tables.
j. understand and calculate improper integrals.
k. understand and calculate various properties of the conic sections (i.e. parabolas, ellipses and hyperbolas).

15. METHODS OF TEACHING –E.G. LECTURES, LABORATORIES, AND OTHER ASSIGNMENTS FOR STUDENTS, INCLUDING ANY OF THE FOLLOWING: DEMONSTRATIONS, GROUP WORK, WEBSITE OR E-MAIL INTERACTIONS AND/OR ASSIGNMENTS, PRACTICE IN APPLICATION OF SKILLS, ETC.:
CLASSROOM LECTURE AND RECITATION

16. ASSIGNMENTS TO STUDENTS: TEXTBOOK EXERCISES AND PROJECTS.

17. DESCRIBE METHOD OF EVALUATING LEARNING SPECIFIED IN #15 - INCLUDE PERCENTAGE BREAKDOWN FOR GRADING. IF A DEVELOPMENTAL COURSE INCLUDE HOW THE NEXT LEVEL COURSE IS DETERMINED AS WELL AS NEXT LEVEL PLACEMENT.
CLASS EXAMINATIONS, CLASS PROJECTS AND EXERCISES TO FURTHER UNDERSTANDING DURING RECITATION AND FINAL EXAMINATION.

18. TOPICAL COURSE OUTLINE FOR THE 12 WEEK SEMESTER (WHICH SHOULD BE SPECIFIC REGARDING TOPICS COVERED, LEARNING ACTIVITIES, AND ASSIGNMENTS):

A lesson number preceded by an L indicates a lab

Lesson	Topic	Section
L1	Review: the definite integral	5.3
L2	Review: evaluating integrals	5.4-5.5
3	Area between two curves	6.1
4-5	Volume: the disc method	6.2
6	Volume: the shell method	6.3
7-8	Arc length (optional: surfaces of revolution)	6.4
L9	Work	6.5
10	(optional)Fluid pressure	6.6
11	Examination	
L12	Exponential functions	7.1
L13-14	Derivatives and integrals of exponential functions	7.2
15	Inverse functions and their derivatives	7.3
L16	Logarithmic functions	7.4
17	Derivatives of logarithmic functions	7.5
L18	Integrals involving logarithmic functions	7.6
L19	Exponential growth and decay	7.7
20	L'Hospital's rule	7.8
21	Examination	
22	Review: derivatives of trigonometric functions	8.3
L23-24	Integrals of trigonometric functions	8.4
25-26	Inverse trigonometric functions and their derivatives	8.5
27	Integrals involving inverse trigonometric functions	8.6
L28	(optional) Hyperbolic functions	8.7
L29	Integration: basic formulas	9.1
L30	Integration by parts	9.2
31-32	Trigonometric integrals	9.3
33	Examination	
L34-35	Integration by trigonometric substitution	9.4
L36-37	Integration by partial fractions	9.5
L38	Using integral tables	9.6
39	Improper integrals	9.7
40	Parabolas	11.1
41	Ellipses	11.2
42	Hyperbolas	11.3
L43	(optional) Rotation of axes	11.4
44	Examination	
L45-48	Semester review	

19. SELECTED BIBLIOGRAPHY AND SOURCE MATERIALS:

Mendelson, *3,000 Solved Problems in Calculus*, McGraw-Hill, 1988
Mendelson and Ayers, *Schaum=s Outline of Calculus*, McGraw-Hill, 1999
Passow, *Schaum=s Outline of Understanding Calculus Concepts*, McGraw-Hill, 1996

Revised 01/2018
Syllabus developed by Dr. Stanley Rabinowitz