QUEENSBOROUGH COMMUNITY COLLEGE
THE CITY UNIVERSITY OF NEW YORK

COURSE OUTLINE

IS-221 COGNITIVE AND BEHAVIORAL LEARNING IN SECONDARY MATHEMATICS

Pre-requisite: 2.75 GPA; completion of MA-440 with a B or better; letter of recommendation from a mathematics instructor.

Hours: 3 Class Hours, 1 Conference Hour, 20 Hours of Field Work* **4 Credits**

Course Description: This course provides students with an understanding and appreciation of the basic concepts and principles of cognitive and behavioral learning in secondary mathematics. Topics include: definitions of learning, cognitive development, constructivism, motivation, thinking skills, and problem solving as related to mathematics learning and teaching.

Curricula for which the course is required/recommended:
A.S. Degree in Liberal Arts and Sciences (Mathematics and Science)

General Education Objectives: Students will use analytical reasoning skills to identify issues or problems and evaluate evidence in order to make informed decisions; students will write, read, listen and speak clearly and effectively; students will identify concepts and methods of the social sciences to examine human behavior in their program of study; students will use personal and collaborative skills for personal growth and to establish constructive relationships in a diverse society; students will use information technology skills effectively for academic research and lifelong learning.

Course Objectives/ Expected Student Learning Outcomes: Students will understand important concepts and theories of cognitive and behavioral learning; students will recognize the use of these concepts and theories in field work experiences, apply them, and communicate their observations and experiences to others both orally and in writing; students will demonstrate their ability to incorporate technology to promote learning and support instruction.

Text: **Educational Psychology: Windows on Classrooms, 8th Edition**
By Paul Eggen and Don Kauchak, Merrill/Prentice Hall, 2010

Methods by which student learning will be evaluated:

Methods used to evaluate student learning will be multidimensional.

The general guidelines for assessing grades are as follows:

- Assignments, Writings and Reflections 20%
- Presentations, Reports and Projects 40%
- Examinations 40%

The distribution may be changed at the discretion of the instructor team.

Academic Integrity: Academic honesty is taken extremely seriously and is expected of all students. All assignments must be the original work of the student (and partners or group, if applicable). All questions or concerns regarding ethical conduct should be brought to the course instructor. "It is the official policy of the College that all acts or attempted acts that are violations of academic integrity be reported to the Office of Student Affairs (OSA). At the faculty member's discretion and with the concurrence of the student or students involved, some cases, though reported to the OSA, may be resolved within the confines of the course and department. The instructor has the authority to adjust the offender's grades as deemed appropriate, including assigning an F to the assignment or exercise or, in more serious cases, an F to the student for the entire course." (Taken from the QCC Academic Integrity Policy, 2/14/2005.)

NOTE: *Any student who feels that he/she may need an accommodation based upon the impact of a disability should contact the instructor privately to discuss his/her specific needs. Please contact the office of Services for Students with Disabilities in Science Building, room 132 (718 631 6257) to coordinate reasonable accommodations for students with documented disabilities*.

* May be satisfied by completion of an internship in the QCC Mathematics Learning Center.

IS-221 COGNITIVE AND BEHAVIORAL LEARNING IN SECONDARY MATHEMATICS

IS-221 is team taught by an instructor from the Social Science Department (Education Division) and an instructor from the Mathematics Department. The purpose of this course is to promote an understanding and appreciation of the basic concepts and principles of child/adolescent development and learning with a focus on students of mathematics at the secondary level. A key assumption of this course is that knowledge of how children develop and learn is an important dimension of effective delivery of mathematics instruction. As such, prospective mathematics teachers will have the opportunity to experience topics related to children's cognitive, social, and personal development and learning.

Specifically, students will be asked to:

1. Reflect on their own learning experiences involving mathematical concepts.
2. Share such experiences with others in the class.
3. Make connections between their knowledge and new learning experiences in class.
4. Make connections between their knowledge and an appreciation of the needs of diverse learners that they will encounter in their future practice as secondary mathematics teachers.
5. Apply new learning to other mathematics classroom contexts.

Discussion, questioning, and small group activities will be the primary teaching strategies used to engage students in the class.

TOPICS	**CHAPTERS**	**HOURS**
1. Learner Differences, Learning Styles, Multiple Intelligences, Model of Nested Ecology of Child Development, Definitions of Learning, Development of Multi-Modality Instructional Materials.	Chapter 4	8
2. Information Processing and Memory	Chapter 7	6
3. The Human Brain and Cognitive Development: Piaget and Vygotsky	Chapter 2	6
4. Constructivism in the Mathematics Curriculum	Chapter 8	5
5. Motivation and Attribution Theories in the Mathematics Classroom: Promoting Self-efficacy.	Chapter 10 & Chapter 11	5
6. Personal and Social Development as applied to Mathematics Learning: Erikson	Chapter 3	3
7. Thinking Skills and Problem Solving Concept Learning in Mathematics	Chapter 9	3
8. Project Presentations		3
Exams: Mastery Exams for Each Topic		3
	TOTAL:	42

The approximate hours per chapter are guidelines and are at the discretion of the instructors. The instructors are responsible for making assignments and scheduling examinations.