SUNY Orange General Education Assessment Plan –Cycle 2

Competency: **Mathematics***
Year: **Part 1 2005/2006, Part 2: 2006/2007**

SUNY Student Learning Outcome(s):

Interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics.
Represent mathematical information symbolically, visually, numerically and verbally.
Employ quantitative methods such as, arithmetic, algebra, geometry, or statistics to solve problems.
Estimate and check mathematical results for reasonableness.
Recognize the limits of mathematical and statistical methods.

Course(s)
Each General Education Mathematics courses will assess the five student learning outcomes following the Standards and Scoring Rubric developed by the SUNY Mathematics discipline panel. In order to assess every course, the assessment must be conducted in two parts, over two academic years with the majority of the courses being assessed during the Spring 2006 semester. See chart below for a timeline on when courses are scheduled for assessment.

Part 1	**Part 2**	
Spring 2006	**Fall 2006**	**Spring 2007**
38104 Intermediate Algebra	38105 Mathematics for the Liberal Arts	38106 Contemporary Mathematics
38107 College Algebra	38109 Pre-calculus	38114 Introduction to Discrete Mathematics
3810: College Trigonometry	38209 Linear Algebra	
38111 Fundamentals of Elementary School Mathematics		
38112 Introduction to Statistics		
38205 Calculus 1		
38206 Calculus 2		
38207 Calculus 3		
38208 Differential Equation		

Sampling Information
All Mathematics General Education courses will be assessed using a random sampling method based on the total number of students enrolled in each course. For courses with 20 or more students, no less than 20% of the total course population will be selected randomly to be assessed. For courses with no more than 20 students, all students will participate in the assessment. The following table shows the estimated total course population, sample percentage and sample size for the 9 courses to be assessed in Spring 2006. The 5 courses listed in Part 2 of the assessment cycle will follow similar sampling methods.

Course	Total Course Population	Sample Percentage	Sample Size
38104	over 400	20%	over 80
38107	over 120	20%	over 24
38108	over 40	50%	over 20
38111	over 40	50%	over 20
38112	over 30	70%	over 20
38205	over 70	30%	over 20
38206	under 20	100%	all students

38207	under 20	100%	all students
38208	under 20	100%	all students
Total	**over 800**	**over 25%**	**over 200**

Assessment Instrument & Methods

Each course being assessed will develop and administer its own assessment instrument. Every assessment instrument, however, will consist of five questions to assess each of the five SUNY Student Learning Outcomes. Each question will be properly designed so that it can be scored using the following criteria levels:

CC: completely correct; exceeding
GC: generally correct; meeting
PC: partially correct; approaching
IC: incorrect; not meeting

These criteria levels are based on the Standards and Scoring Rubric for Assessing General Education in Mathematics, developed by the Discipline Panel in Mathematics, GEAR, SUNY, 09/08/05.

Validity - Assessment task forces were formed for each General Education course in order to develop the assessment instrument. Task forces are comprised of 3-4 faculty members from the Mathematics Department and are headed by either a full-time professor or an experienced faculty member. Each assessment instrument was circulated among all faculty members in the Mathematics Department for review and recommendations with task forces making the appropriate revisions. This peer review process ensures content validity of the assessment instruments. Final versions of the assessment instruments will be ready for administration at the beginning of the Spring 2006 semester.

Administration - Faculty members will determine which of two administration methods they will follow. The methods include, administering the instrument within the course's final exam or administering the instrument within course exams and/or quizzes throughout the semester. Students in each course will receive a copy of the scoring guide before taking either the (final) exam or quizzes. Regardless of the method selected, all questions will be tested. All assessment instruments will be collected, coded, and kept in the Department for sampling purposes.

Externally Referenced Measures: SUNY's Mathematics Standards and Scoring Rubric - When all of the assessments have been administered at the end of the Spring 2006 semester, assessments will be randomly selected for scoring by full-time faculty members. Assessments will be scored using the Standards and Scoring Rubric developed by SUNY. All assessment work will be supervised by the Chair of the Mathematics Department. The Department will maintain all assessment instruments, scores, and results.

Inter-Rater Reliability - Two faculty readers/raters will score no less than 20% of the assessments in order to obtain a reliable score. The faculty members of each task force will participate in norming sessions prior to the administration and scoring of the assessment. The norming sessions will result in faculty agreement of the scoring definitions at least 90% of the time. Ongoing norming sessions will be held to ensure consistency in the scoring of student performance. If discrepancies occur in the scoring, a third faculty reader/rater will score the student work.

The Mathematics Department requests compensation information from SUNY for both the norming process as well as for the second reader/rater of the 20% sample.

Standards & Expected Results - The Mathematics Department will follow the standards for "exceeding, meeting, approaching, and not meeting" as defined in the Scoring Rubric developed and described by SUNY.

The Department expects that at least 67% of the sample population will either meet or exceed the standard for each student learning outcome.

Results & Dissemination

In June 2006, the results of the assessment of the first 9 courses of General Education in Mathematics will be forwarded to the Office of Vice President of Academic Affairs (VPAA), the Associate Vice President for the Mathematics, Business, Science, and Technology Division (AVP), the Assessment Coordinator, the Assessment Advisory Committee as well as any additional offices and committees as appropriate. The assessment findings will be available for Departmental review, institutional research, and external mandate requirements. The report for the remaining 5 courses will be available in June 2007; assessment scores from Part 1 and 2 of the assessment will be aggregated.

The following table will be used to summarize the assessment results.

SUNY Student Learning Outcomes	"Exceeding" (CC)	"Meeting" (GC)	"Approaching" (PC)	"Not Meeting" (IC)
Interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics				
Represent mathematical information symbolically, visually, numerically and verbally				
Employ quantitative methods such as, arithmetic, algebra, geometry, or statistics to solve problems				
Estimate and check mathematical results for reasonableness				
Recognize the limits of mathematical and statistical methods				

Utilization of Results - Assessment results will be reviewed immediately after scoring to identify both strengths and weaknesses of the General Education courses in Mathematics. Recommendations for improvement will be made and actions steps will be developed and incorporated into the Department's planning documents.

This plan was developed through the hard work of faculty led task forces from SUNY Orange's Mathematics Department. Assistance was provided by the General Education Committee and the Assessment Coordinator. The plan was approved by the Mathematics Department, Department Chair, and the General Education Committee.

**Indicates Strengthened Campus Based Assessment*