APPENDIX B
DUPLICATION AND SECOND-GRADE-ONLY (SGO) OPTIONS

The Department of Mathematics offers many introductory level courses. This raises questions of <u>duplication</u> (which is assessed when you take a course or its equivalent more than once but the course is not repeatable for credit.) At the same time, many of our courses build on the introductory courses or others, and there are situations of <u>regression</u> (occurs when you take a course that is earlier in the sequence than one you have already taken and passed.). Finally, because students' interests may change, we need to be clear about when one course can be used as a <u>second-grade-only (SGO)</u> for another course.

GUIDING PRINCIPLES
Some examples appear below, but these are just to illustrate the policies; the complete lists are given in the subsequent sections.

1. **We offer many service courses, and also have parallel tracks for different majors; so course number is <u>not</u> a safe guide for which course is more advanced than another.** This is why the Regression list looks complicated. For example, MATH:1020 is much more advanced than MATH:1340. On the other hand, MATH:1240 is independent of nearly all other undergraduate courses, so there is no Regression in taking MATH:1240 even after taking MATH:3600.

2. **There are groups of similar courses given in next few pages. Within a group, <u>usually</u>, taking any two courses means *duplication*, and any course can be used as *SGO* for any other.** The courses really are different in subject emphasis and sometimes even a little different in level, and the students should be advised carefully in selecting courses. These approximate groupings are a compromise, to give students and advisors reasonable flexibility. For example, one of the "short calculus" courses MATH:1460 or MATH:1380 *duplicates* the other, and can be used to *SGO* the other.
   <u>Note</u>: Other departments may distinguish between these courses; for example, we do NOT encourage a biological science department to accept MATH:1380 in lieu of MATH:1460, nor a business program to accept MATH:1460 in lieu of MATH:1380.

3. **The group-numbers DO represent increasing level.** For example, taking any course in Group 2 after passing a course in Group 3 constitutes *regression*.

4. **Some courses have substantial overlap but are different enough to justify not to count them as complete duplications, with a reduction in total credits**. This usually occurs with the Engineering courses, see the end of Appendix B, and Appendix C.
   <u>For example</u>, MATH:1560 (4 s.h.) and MATH:2850 (4 s.h.) together is 6 s.h. total, rather than 8.

POLICY

To meet the needs of diverse students and other departments, we offer several approaches to Calculus at each of several levels. Each course is designed with a certain emphasis and sequencing of topics. We encourage departments, students, and advisors to be careful in selecting appropriate courses and in maintaining the course distinctions.

The Math Department policy on SGOs is not intended to change any policies of other departments or programs regarding which courses satisfy their requirements. The SGO is intended to be used to improve the GPAs of the students. Two courses in the same group are considered similar, but they are not necessarily equivalent. Consequently, some departments or programs may choose to accept one of the courses in a group to satisfy their requirements for their majors, but not necessarily the other courses in the same group. These departmental decisions are not affected by the SGOs the Mathematics Department allows. A student staying in the same major or program should repeat the same course for SGO, unless the first course was not chosen correctly for the current major or program. Students may change majors or programs, and it is desirable to allow alternatives for SGOs. A student changing majors or programs will be served better to take the second course (i) which is in the same group as first course, and (ii) that the new major department or program requires. The rule is simple: the second course you take must be the one that your intended major and/or program requires. If you have any questions about which course to take, then you need to ask the department of your intended major.

Example: A student moving from Biology to Business would be better served taking MATH:1380 than repeating MATH:1460. On the other hand, if the student intends to remain a Biological Sciences major, then the student should be required to SGO MATH:1460 with MATH:1460.

There are six groups of similar courses. Within each group, taking two different courses – or one course twice – constitutes *duplication***. Within each group, the courses can be used for a Second-Grade Only (SGO) option. Please read the previous pages about the Math Department policy on Duplication and Second Grade Only option.**

<u>Group 1:   Math Courses Primarily for Education Majors</u>

MATH:1120 *(22M:006)* Logic of Arithmetic
MATH:1130 *(22M:012)* Theory of Arithmetic
(MATH:1130 is intended for Math specialist. Check with the El Ed Advisor as to see which one is appropriate.)

<u>Group 2:   Precalculus Courses</u>

MATH:1020 *(22M:009)*   Elementary Functions
MATH:1340 *(22M:013)*   Mathematics for Business
MATH:1440 *(22M:015)*   Mathematics for the Biological Sciences

Group 3:   Short Calculus Courses
MATH:1380 *(22M:017)*   Calculus and Matrix Algebra for Business
MATH:1460 *(22M:015)*   Calculus for the Biological Sciences

Group 4:   First semester Calculus Courses*
MATH:1550 *(22M:031)*   Engineering Math I: Single Variable Calculus
MATH:1850 *(22M:025)*   Calculus I

Group 5:   Second semester Calculus Courses*, **
MATH:1560 *(22M:032)*   Engineering Math II: Multi Variable Calculus
MATH:1860 *(22M:026)*   Calculus II

Group 6:   Multivariable Calculus Courses*, **
MATH:3550 *(22M:037)*   Engineering Math V: Vector Calculus
MATH:2850 *(22M:028)*   Calculus III

*These (Groups 4-6) are the policies of the Math Department applying to all math majors for their math degrees, major or minor. However, the policies of the Engineering College are different for the students seeking an engineering degree. Engineering majors, please consult with the advisors from the Engineering College.

**The following combinations of the courses have substantial overlap but are different enough to justify not to count them as complete duplications. The Math Department counts these combinations with a reduction in the total credits (if there is no SGO involved) for the students seeking a major or minor in math.

MATH:1560 + 1860   is   6 s.h. total

MATH:1560 + 2850   is   6 s.h. total

MATH:1560 + 1860 + 2850   is   8 s.h. total,
      (since all of MATH:1560 is covered in MATH:1860 or MATH:2850)

MATH:2550 + 2700   is   4 s.h. total,
      (since all of MATH:2550 is covered in MATH:2700)

MATH:3550 + 2850   is   5 s.h. total,
      (since most of MATH:3550 is included in MATH:2850)

MATH:1560 + 3550 + 2850   is   7 s.h. total.