AGENDA

College Senate Meeting

October 28, 2009
Room E-500
2:15 p.m.

I. Approval of Minutes --- September 23, 2009

II. Report from the Chairperson

III. Curriculum Committee Report

Revised Course Proposal, MAT 230, Introduction to Discrete Mathematical Structures – Department of Mathematics, Engineering & Computer Science

Presented by Prof. John Shean, Chairperson of the Curriculum Committee

IV. Election of 2009-2010 Senate Executive Committee

V. Old Business

VI. New Business

VII. Adjournment

Light Refreshments will be served.

COURSE PROPOSAL FORM

TYPE OF PROPOSAL
☒ PERMANENT
☐ EXPERIMENTAL

For office use only:
CCC
SENATE
CHANCELLOR

PROPOSING DEPARTMENT:	Mathematics, Engineering and Computer Science

SECOND DEPARTMENT FOR JOINT PROPOSAL:	

COURSE TITLE: (maximum 50 characters and spaces)	Introduction to Discrete Mathematical Structures

COURSE ABBREVIATION: (maximum 20 characters and spaces)	Intro Discr Math Str

COURSE NUMBER: Contact Registrar's Office for designated course number.	MAT 230
TYPE NAME OF REGISTRAR CONTACT & GET INITIALS	Thomas Murasso

COURSE STATUS:	☐ NEW ☒ REVISED

CREDITS	4
PER WEEK:	
CLASSROOM HOURS	4
LAB HOURS	0
STUDENT HOURS	4
FACULTY HOURS	4

DO THE LAB HOURS REPRESENT FACULTY CONTACT HOURS?
☐ YES
☐ NO

IF THIS IS A REVISED COURSE, CHECK OFF ALL ITEMS BELOW THAT HAVE BEEN CHANGED:
☐ TITLE CHANGE
☒ CATALOG DESCRIPTION
☐ NUMBER OF CREDITS
☐ NUMBER OF HOURS
☒ PREREQUISITES
☒ COREQUISITES
☒ INSTRUCTIONAL OBJECTIVES
☒ PERFORMANCE OBJECTIVES
☒ GRADING STANDARDS
☒ LIBRARY ARTICULATION
☒ COMPUTER SOFTWARE ARTICULATION
☒ TOPICAL OUTLINE
☐ OTHER Please specify:

IF THE CLASSROOM HOURS & THE NUMBER OF CREDITS ARE NOT IDENTICAL, EXPLAIN THE DIFFERENCE BELOW:

URBAN STUDIES	LIBERAL ARTS
☐ YES	☒ YES
☒ NO	☐ NO

REV. 07/18/05

CATALOG DESCRIPTION: **(maximum of 500 characters and spaces)**

The catalog description should provide students with a description of the course content and methodology. The reading level of the description should be designed for our student population. Also, since catalog descriptions will be used by other colleges as a basis for granting transfer credits, the description should provide adequate information to guide other colleges in their deliberations.

This course covers mathematical concepts essential for continued study in computer science and related fields. Topics of study include: set theory, propositional calculus and rules of reasoning, algorithms and complexity, elementary number theory including applications, recursion, counting principles with applications and graph theory.

Course is Required for: **(e.g., students in the Occupational Therapy Program)**	**Course is Elective for:** **(e.g., students meeting the pre / pre-co / corequisites)**
All students in the Computer Science program	Any student not in the Computer Science program

Course is Closed to: **(e.g., all students not meeting the pre / pre-co / corequisites**	**This Course Replaces:** **(If it is not a replacement course, write "none".)**
Students who have not met the prerequisites	None

This course is part of the following curriculum (program), option, career pattern, cluster, and/or sequence.	**Was this course offered experimentally?**	**If offered experimentally, indicate when:**
Computer Science program	☐ **YES** ☒ **NO**	

PRE/PRE-CO/COREQUISITES: **In determining these requirements, please consider the skills (i.e. reading level, writing level, mathematical ability) the student must possess in order to meet the performance objectives. If any minimum competencies are being waived, explain why they are not required.**

Basic skills and/or ESL	Prerequisites	Pre/Corequisites	Corequisites
Reading (e.g., none, CSE095):	CSE 099		
Writing (e.g., none, ENA099):	ENA/ENG/ESA 099		
Mathematics (e.g., none, MAT096):			
ESL (e.g., none, ESL097, ESL098):	ESL099		

College-Level Course Prerequisites: List the highest college-level prerequisites within each discipline. Do not include embedded prerequisites for courses in this list – e.g., if ENG102 is a prerequisite, do not list ENG101.		
Prerequisites	**Pre/Corequisites**	**Corequisites**
	MAT 201	

Additional Pre/Pre-Co/Corequisites: **Specify pre/pre-co/corequisite, e.g., Prerequisite EMT Certification; Prerequisite CPR Certification, etc.**

This course will first be offered in: (e.g., Fall 12 week Session 2003)	Proposed maximum class size:
Fall I, 2010	30

How many times per year will this course be offered?	Estimated # of students per year:
4	120

Subsequent to the first offering, this course will be offered in the following sessions: (check all that apply)	
☒ **FALL 12 Weeks**	☐ **FALL 6 Weeks**
☒ **SPRING 12 Weeks**	☐ **SPRING 6 Weeks**

Provide a rationale for the proposed course or course revisions.

This course has not been revised since 1982. Some topics have been added in order to align the syllabus more closely with similar courses at senior colleges. The prerequisite has been changed to a pre/co-requisite in order to enable students to take this course earlier in their academic careers.

Grading Standards:
Describe how you will assess the work of students in this class. Please be specific when describing types of assessment tools. Please note that the total of all categories (assignments, exams, oral presentations, research papers, etc.) must be 100%. If appropriate, list the number and percentage value of each type of assessment.
For example: 3 written quizzes at 10% each = 30%.

CATEGORY	%
Exam #1	20
Exam #2	20
Exam #3	20
Project	10
Final Exam	30
TOTAL	**100%**

Provide information about any government, legal, industrial, and professional requirements or vocational objectives, for which the course is designed.

Indicate if the course is being developed for a grant. If so, provide relevant details.

INSTRUCTIONAL OBJECTIVES:

These objectives should focus on the goals of the proposed course, that is, what the instructor expects to achieve. The instructional objectives must be part of the course outline distributed to students at the beginning of each session. Some examples of beginning phrases which may be used for an instructional objective follow.

During this course, the instructor expects to:

enable..
familiarize..
introduce..
provide the student with..
reinforce..

List of instructional objectives:
During this course, the instructor expects to:

1. Familiarize students with the basic principles of mathematical logic (propositional calculus).

2. Introduce the concepts of reasoning and formal proof including mathematical induction.

3. Acquaint students with the important concepts of set theory.

4. Introduce the function concept and enable students to identify different functional representations and types.

5. Familiarize students with the basic properties of algorithms used in a variety of mathematical contexts.

6. Present basic concepts of number theory and teach students how to apply them in computer science contexts.

PERFORMANCE OBJECTIVES:

These objectives describe, in behavioral terms, what the students should be able to do at the end of the course. Your performance objectives must be part of your course outline and should parallel, if possible, your instructional objectives. Some examples of beginning phrases which may be used for a performance objective follow:

At the conclusion of this course students will be able to:

analyze..
compare and contrast..
compute..
define..
describe..
draw..
explain..
identify..
illustrate..
interpret..
locate..
prepare..
solve..
write..

List of performance objectives:
At the conclusion of this course, students will be able to:

1. Compute truth tables and analyze the consistency of a system of statements expressed in propositional calculus.

2. Write short formal proofs using different methods of reasoning such as direct and indirect proof, proof by contradiction, mathematical induction.

3. Solve problems in set theory involving operations on sets and subsets.

4. Describe different representations of a function and identify surjective, injective, and bijective functions.

5. Design algorithms for the solution of different problems and analyze their complexity.

6. Obtain a linear decomposition of the greatest common divisor (gcd) of two positive integers using the Euclidean Algorithm and perform such a computation for a pair of large integers.

INSTRUCTIONAL OBJECTIVES (CONTINUED):	PERFORMANCE OBJECTIVES (CONTINUED):
7. Introduce the method of recursion as a new way to define mathematical objects and familiarize students with the principle of structural induction.	7. Define different mathematical objects using recursion and prove results concerning them via the method of structural induction.
8. Reinforce basic and advanced counting principles, enabling students to employ them in solving a variety of applied problems.	8. Solve combinatorical problems using basic and advanced counting techniques.
9. Introduce fundamental concepts of graph theory and present different graph models.	9. Construct and analyze graph models for problems in different areas.

COURSE OUTLINE:
Provide a weekly, topical outline that will be used to guide instructors in teaching this course. The weekly topical outline should delineate 12 weeks of instruction and the thirteenth week should be labeled "Final Exam." If a course is designed for 6-week sessions only, the outline should delineate 6 weeks of instruction and the seventh week should be labeled "Final Exam."

Week 1. Propositional Logic. Propositional equivalences. Predicates and quantifiers.

Week 2. Rules of inference. Introduction to proofs. Proof methods and strategies.

Week 3. Sets and set operations. Functions. Sequences and summations. Exam #1.

Week 4. Algorithms. Growth of functions. Complexity of algorithms.

Week 5. The integers and division. Algorithms in number theory. Applications of number theory.

Week 6. Mathematical induction. Strong induction. Recursive definitions and structural induction. Recursive algorithms (optional). Exam #2.

Week 7. Basic counting principles: multiplication principle, pigeonhole principle, permutations and combinations.

Week 8. Binomial coefficients. Generalized permutations and combinations.

Week 9. Recurrence relations. Solving linear recurrence relations. Exam #3.

Week 10. Graphs and graph models. Special types of graphs. Graph isomorphism (optional).

Week 11. Connectivity. Euler and Hamilton paths.

Week 12. Shortest-path problems. Planar graphs.

COURSE OUTLINE: (CONTINUED)

COURSE OUTLINE (CONTINUED):

COURSE OUTLINE (CONTINUED):

LIBRARY/FACILITIES ARTICULATION

Please give author, title, edition, publisher and date for each book; title and publisher for each periodical title. Provide ISBN or ISSN if easily accessible. For media items, include distributor. After each item, indicate the status as follows: in collection (IC), on order (O/O), or recommended for purchase (R).

#1 TEXTBOOK(S): (Text on tape will be ordered if available.) (Specify STATUS at end of each entry.)	
AUTHOR(S):	Kenneth H. Rosen
TITLE:	Discrete Mathematics and Its Applications
EDITION:	Sixth Edition
PUBLISHER:	McGraw-Hill
DATE:	2007
ISBN:	978-0-07-288008-3
STATUS: (Check one)	☒ IC ☐ 0/0 ☐ R
AUTHOR(S):	Seymour Lipschutz, Marc Lipson
TITLE:	Schaum's Outline of theory and problem of discrete mathematics
EDITION:	2-nd
PUBLISHER:	McGraw-Hill
DATE:	2003
ISBN:	0-07-038045-7
STATUS: (Check one)	☐ IC ☒ 0/0 ☐ R
AUTHOR(S):	Seymour Lipschutz, Marc Lipson
TITLE:	2000 solved problems in Discrete Mathematics
EDITION:	1st
PUBLISHER:	McGraw-Hill
DATE:	1992
ISBN:	0-07-038031-7
STATUS: (Check one)	☒ IC ☐ 0/0 ☐ R

#2 ADDITIONAL BOOKS TO SUPPORT THIS COURSE: (Specify STATUS at end of each entry.)	
AUTHOR(S):	
TITLE:	
EDITION:	
PUBLISHER:	
DATE:	
ISBN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
AUTHOR(S):	
TITLE:	
EDITION:	
PUBLISHER:	
DATE:	
ISBN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
AUTHOR(S):	
TITLE:	
EDITION:	
PUBLISHER:	
DATE:	
ISBN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R

#2 ADDITIONAL BOOKS TO SUPPORT THIS COURSE (Continued)
(Specify STATUS at the end of each entry.)

AUTHOR(S):	
TITLE:	
EDITION:	
PUBLISHER:	
DATE:	
ISBN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
AUTHOR(S):	
TITLE:	
EDITION:	
PUBLISHER:	
DATE:	
ISBN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
AUTHOR(S):	
TITLE:	
EDITION:	
PUBLISHER:	
DATE:	
ISBN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R

Append additional page if necessary.

#3 SERIALS: (newspapers, magazines, journals, yearbooks)
(Specify STATUS at the end of each entry.)

Note that the Library will not be able to subscribe to many new serials. However, the articles from more and more periodicals appear in the Library's electronic full-text databases.

SERIAL TITLE:	
PUBLISHER:	
ISSN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
SERIAL TITLE:	
PUBLISHER:	
ISSN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
SERIAL TITLE:	
PUBLISHER:	
ISSN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
SERIAL TITLE:	
PUBLISHER:	
ISSN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
SERIAL TITLE:	
PUBLISHER:	
ISSN:	
STATUS: (Check one)	☐ IC ☐ 0/0 ☐ R
TYPE LIBRARY LIASON'S NAME AND OBTAIN INITIALS (#1-3)	Francine Egger-Sider

#4 MEDIA ITEMS: (films, videos, cassettes, CDs, DVDs, slide sets, filmstrips, etc.) (Specify STATUS at the end of each entry.)			
TITLE:	Discovering Mathematics with Maple		
DISTRIBUTOR	Birkhauser Verlag		
STATUS: (CHECK ONE)	☒ IC	☐ 0/0	☐ R
TITLE:			
DISTRIBUTOR			
STATUS: (CHECK ONE)	☐ IC	☐ 0/0	☐ R
TITLE:			
DISTRIBUTOR			
STATUS: (CHECK ONE)	☐ IC	☐ 0/0	☐ R
TITLE:			
DISTRIBUTOR			
STATUS: (CHECK ONE)	☐ IC	☐ 0/0	☐ R

Append additional page if necessary.

TYPE MEDIA LIAISON'S NAME & OBTAIN INITIALS	Albert Neal

Provide the mean or median enrollment in courses offered by the department or program during the last term for which data is available.
15

INFORMATION LITERACY:
The proposer and the library faculty have collaborated on plans for the above listed (and other) resources to be used in activities designed to increase student information literacy.

TYPE NAME OF LIBRARY FACULTY & OBTAIN INITIALS	Francine Egger-Sider

SOFTWARE/HARDWARE REQUIREMENTS: (e.g., commercial application package, microcomputer or other special facilities required)

Maple

TYPE NAME OF DIRECTOR OF INSTRUCTIONAL SERVICES & OBTAIN INITIALS (only if applicable)	Theresia Litvay-Sardou

TYPE PROPOSER'S NAME & OBTAIN INITIALS	Marina Dedlovskaya

APPROVAL PAGE:
For all items below, type in the faculty and department names and obtain the initials for each person listed.

PROPOSER (S)	DEPARTMENT(S)	DATE
Marina Dedlovskaya	MEC	

CHAIRPERSON(S) OF DEPT. CURRICULUM COMMMITEE(S)	DEPARTMENT(S)	DATE
Rudy Meangru	MEC	

DEPT'L. REPRESENTATIVE(S) TO COLLEGE-WIDE CURRICULUM COMMITTEE	DEPARTMENT(S)	DATE
Gordon Crandall	MEC	

DEPARTMENT CHAIRPERSON(S)	DEPARTMENT(S)	DATE
Kamal Hajallie	MEC	