General Education Course Proposal

Proposed Course: DS 71, Quantitative Analysis I (Prefix No. Title) **Units:** 3.0

Department: Information Systems & Decision Sciences **School:** Craig School of Business

GE Category:
Foundation: B4
Existing Course: Yes
Course Included in Current GE Program: Yes

Proposed catalog description:

Prerequisite: Students must take the ELM exam; students who do not pass the exam must record a grade of *C* or better in a college-taught intermediate algebra course. Quantitative formulation and solution of problems in various disciplines, including mathematics of finance, linear programming, probability, and differential calculus. General Education Foundation, Quantitative Reasoning (B4).

Enrollment limit per section: 48
Expected number of sections per semester – Year 1 8 ; **Year 3** 8

Attachments:

1. A statement presenting the ways in which this course meets the Specifications provided in the appropriate section of the General Education Policy as well as in the Policies for Inclusion and Evaluation of General Education Courses.
2. An annotated course description detailing a statement of elements common to all sections of this course.
3. A typical syllabus for the course identifying content, objectives, required student activities, grading policy, representative texts, and a tentative schedule for the course. Required student activities such as attendance, homework, class participation, quizzes, exams and final exam are noted, as are materials required for the course.
4. Special cost factor noted on the syllabus: a hand-held calculator (See Attachment 3).
5. A set of supplemental historical materials provided to each instructor to use in lecture and/or duplicate for distribution.
6. Enrollment analysis, faculty assignments, DS 71, 1993-1998.
7. A memorandum of support from the CSB Committee on Undergraduate Programs.
8. A memorandum of support from Dean Fred Evans.

Approval for Inclusion in General Education

2-23-98
Department Chair — Date

2/24/98
Chair, School Curriculum Committee — Date

2/25/98
School Dean — Date

12/15/98
Chair, General Education Subcommittee — Date

12/22/98
Associate Provost — Date

FEB 26 1998

ATTACHMENT 2

Decision Sciences 71: Quantitative Analysis I
Annotated Course Description
California State University, Fresno

Current text: *Mathematics with Applications*, Sixth Edition, by Lial, Hungerford, Miller

TOPICS	CHAPTERS & TEXT SECTIONS	TYPICAL TIME	APPLICATIONS DEVELOPED IN TOPICAL AREA
Functions Linear Quadratic Polynomial (optional) Rational (optional) Exponential Logarithmic	**Chapters 2, 3, 4** 2.1 – 2.4 3.1 – 3.2 3.3 3.4 4.1 – 4.2 4.3 – 4.4	**3 weeks**	Biology Business, particularly supply, demand, cost, revenue, profit functions Chemistry Ecology Economics, domestic and international applications Geography Linguistics Medicine Physics Psychology Social science
Mathematics of Finance Simple interest Discount Compound interest Effective interest rate Future and present value Sinking funds Annuities Amortizations	**Chapter 5** 5.1 5.1 5.2 5.2 5.3 5.4	**3 weeks**	(taught as an extension of exponential and logarithmic functions) Business Consumer applications Economics Finance

TOPICS	CHAPTERS & TEXT SECTIONS	TYPICAL TIME	APPLICATIONS DEVELOPED IN TOPICAL AREA
Systems of Equations & Matrices Systems of equations Gauss-Jordan method (optional) Matrix operations (optional)	**Chapter 6** 6.1 6.2 6.3-6.6	**1 – 2 weeks**	Agriculture Animal science Biology Business Economics Geography Nutrition Psychology Social science Zoology
Linear Programming Geometric method Simplex method (optional)	**Chapter 7** 7.1 – 7.3 7.4 – 7.6	**1 – 2 weeks**	Agriculture Animal science Biology Business Ecology Economics Finance Nutrition Social science Zoology

TOPICS	CHAPTERS & TEXT SECTIONS	TYPICAL TIME	APPLICATIONS DEVELOPED IN TOPICAL AREA
Sets, Counting, Probability, Expected Value	**Chapters 8, 9**	**3 – 4 weeks**	Biology Business Ecology Economics Education Geology Medicine Political science Psychology Sports
Sets	8.1		
Venn Diagrams, event trees	8.2, 8.5		
Probability: Simple, joint, conditional	8.2 – 8.5		
Independent events	8.5		
Bayes' theorem	8.6		
Counting: Permutations, combinations	9.1 – 9.2		
Bernoulli trials	9.3		
Binomial probability distribution	9.3		
Markov chains (optional)	9.4		
Expected value (optional)	9.5		
Rates of Change	**Chapter 11**	**1 – 2 weeks**	Business, particularly supply, demand, cost, revenue and profit functions Marginal cost, marginal profit, marginal revenue Biology Economics Physics Psychology
Average rates of change	11.2		
Instantaneous rates of change	11.2		
Derivatives: Function notation (optional) Power rule	11.3		
Optimization (optional)	11.4 – 11.5		

ATTACHMENT 3: Typical Syllabus

CALIFORNIA STATE UNIVERSITY, FRESNO
Information Systems and Decision Sciences

DS 71: QUANTITATIVE ANALYSIS I

COURSE GOALS

This course is designed to provide students with the knowledge and skills necessary:

1. To familiarize the student with the mathematical concepts involved in the formulation and solution of various quantitative models. Applications will be developed in a variety of disciplines.
2. To motivate the student to utilize the powerful tools of quantitative analysis to sharpen his or her decision-making skills.
3. To appreciate the value of quantitative models in decision-making.
4. To appreciate some historical perspective on the development of key quantitative methods and associated tools.

MANDATORY PREREQUISITES

No student shall be admitted to DS 71 without taking the Entry Level Mathematics Test (ELM); students who do not pass the exam must record a grade of *C* or better in a college-taught intermediate algebra course. Students who are exempt must provide proof of exemption from the ELM test as detailed in the CSU Fresno General Catalog.

PROFESSOR

<Faculty name>
Office Telephone: 278-xxxx

Office: Peters Building xxx
Office Hours: (as announced each semester)
& by appointment

MATERIALS REQUIRED FOR THE COURSE

Mathematics with Applications, 6th edition, by Lial, Hungerford, Miller. Harper Collins Publishers.

Calculator with which you can perform: $+, -, \cdot, \div, e^x, y^x, \ln x, \sqrt{x}, \bar{x}, s$ or σ_{n-1}

COURSE CONTENT

Chapter	Topics
2	Functions/Graphs
3	Polynomial/Rational Functions
4	Exponential/Logarithmic Functions
5	Mathematics of Finance
6	Systems of Linear Equations and Matrices
7	Linear Programming
8	Sets and Probability
9	Further Topics in Probability
11	Differential Calculus

STUDENT CONDUCT

Honesty is fundamental to the ethical environment and academic integrity of the university. It is essential to the maintenance of mutual trust in the campus community. Cheating and plagiarism erode the integrity of the student/faculty relationship and will not be tolerated in this class. Students are reminded that the University Policy on Cheating and Plagiarism will be strictly enforced for the protection of all.

COURSE REQUIREMENTS

❖ **ATTENDANCE:** Attendance will be taken daily. The professor may use a written exercise done in class as the basis for attendance. **Good attendance will be rewarded with extra credit points to be added to the student's semester average as follows:**

0 absence	**2.0%**	**3 absences**	**0.8%**
1 absence	**1.6%**	**4 absences**	**0.4%**
2 absences	**1.2%**	**5 or more absences, receive no attendance points.**	

Absences will not be excused without written documentation. All absences should be discussed with the instructor, in advance of the absence wherever possible.

❖ **ASSIGNMENTS:** Most students expect to rehearse in preparation for physical performances. Very few students bring the same preparation to mental performances. Learning is a complex process that is strengthened by practice. Each time you work a problem, different aspects of the problem become clearer, even though you move through the solution more quickly. In rehearsing a problem, you refine the mechanical procedures to the point that you begin to focus on the connections between the steps and the underlying logic of the solution.

Practice makes more than perfect; practice makes understanding.

Working problems is where most students learn. Your study of quantitative analysis will be greatly enhanced if you rehearse the problem sets by working problems several times.

The design of this course will regularly involve a considerable amount of student activity during the class meetings in the form of in-class assignments.

Students are required to bring a pencil, the textbook, and a calculator to ALL class meetings.

It is the student's responsibility to be able to operate the calculator efficiently. In-class assignments will be collected frequently and graded on a 10-point scale. Students who have completed the homework assignments conscientiously should find most of these exercises straightforward. Unless a student's absence is excused, in-class assignments may not be made up when missed.

Homework assignments will be assigned. Students should complete all homework assignments and be ready to ask pertinent questions on the assignment the class meeting immediately following the completion of the lecture on the material. This is the instructor's definition of "timely manner" as used in the following:

It is the student's responsibility to complete each homework set, correct answers, and ask all pertinent questions on the assignment in a timely manner.

❖ **QUIZZES:** There will be quizzes given during the semester. The quizzes may or may not be announced. Material will not be included on quizzes until the lecture on the material is complete and students have had a minimum of one class meeting in which to ask questions about the material and related homework and/or in-class assignments.

During quizzes, calculators may not be shared and caps, if worn indoors, must be turned with the brim to the back. Hats may not be worn indoors during a quiz.

Prior consent of the instructor is required to make-up quizzes.

Unless a student's absence is excused, quizzes may not be made up when missed. Prior consent means that the student has discussed known absences with the professor in advance of the date in question and alternate plans have been approved. Placing a voice or electronic mail message to the professor in and of itself does not constitute prior consent.

❖ **EXAMINATIONS:** There are tentatively scheduled three (3) examinations during the semester. The instructor reserves the right to expand, cancel, or combine examinations if the pace of the course changes from that outlined on the attached Tentative Schedule. Dates are shown on the attached Tentative Schedule.

During examinations, calculators may not be shared and caps, if worn indoors, must be turned with the brim to the back. Hats may not be worn indoors during an examination. Unless a student's absence is excused, examinations may not be made up when missed.

Prior consent of the instructor is required to make-up exams.

Unless a student's absence is excused, examinations may not be made up when missed. Prior consent means that the student has discussed known absences with the professor in advance of the date in question and alternate plans have been approved. Placing a voice or electronic mail message to the professor in and of itself does not constitute prior consent.

❖ **FINAL EXAMINATION:** The final examination will be comprehensive and will be given when scheduled in the University's Schedule of Classes.

Prior consent of the instructor will be required for any deviations from the posted final examination time for your class section.

THE ATTACHED SCHEDULE AND PROCEDURES INDICATED ABOVE ARE SUBJECT TO CHANGE IN THE EVENT OF EXTENUATING CIRCUMSTANCES.

GRADING POLICY

Assignments	15%
Quizzes	20%
Examinations	45%
Final Examination	20%
	100%

Good attendance will earn up to 2% added to the semester average. See section on Attendance above.

RECORD OF SCORES TO DATE

Attendance:

Note your own absences.

_____ _____ _____ _____

In-Class Assignments:

Date	Score	Date	Score

Quizzes:

Date	Score	Date	Score

Exams:

Exam 1:_____ Exam 2:_____ Exam 3:_____

To compute your grade to date:

Sum the points you have earned to date in each of the areas above. Divide each of those sums by the total points available on those activities to get an average score for each area. Multiply the average score for each area by each of the respective weights shown in the Course Evaluation at the top of this page. Sum those products and divide by 80%. You can use this procedure to see how well you should do on future activities to maintain the semester grade you want.

TENTATIVE SCHEDULE for DS 71, Spring		
	Tuesday	Thursday
Week 1	Introduction, Syllabus, Course Organization, Schedule, 2.1	2.2, 2.3
Week 2	2.4, 2.5	Review, 3.1
Week 3	**Exam 1** Chapter 2 only	3.2, 3.3
Week 4	4.1, 4.2	4.2, 4.3
Week 5	4.3, 4.4	Review
Week 6	5.1, 5.2	5.3, 5.4
Week 7	**Exam 2** Chapters 3 & 4	5.4, 5.5
Week 8	8.1, 8.2	8.3, 8.4
Week 9	**Spring Break**	**Spring Break**
Week 10	8.5, 8.6	Review
Week 11	**Exam 3** Chapters 5 & 8	9.1, 9.2
Week 12	9.3, 9.4, 9.5	6.1, 6.2, 6.3
Week 13	6.4, 6.5, 6.6	7.1, 7.2, 7.3
Week 14	7.2, 7.3, 7.5	7.5, 7.6
Week 15	11.2, 11.3	Review
Partial Week 16	Review Last Instructional Day	