

PROPOSAL NUMBER: 99-522

# CURRICULUM PROPOSAL FORM

**\*DEADLINES:**

REGULAR COURSE PROPOSALS: OCTOBER 23, 1998 FOR FALL, 1999 AND FEBRUARY 19, 1999 FOR SPRING, 2000  
 SHORT-TERM COURSE PROPOSALS: DECEMBER 11, 1998 FOR FALL, 1999 AND MARCH 26, 1998 FOR SPRING 2000

PROPOSAL TITLE: Machine Design  
 SPONSOR/S: Jawahardal Mariappan, Associate Professor. \$  
 DEPARTMENT: Mechanical Engineering  
0910-241

**CHECK ALL THAT APPLY:**

UNDERGRADUATE       GRADUATE

**COLLEGE:**

If LAS:       History/Humanities  
                   Math/Sciences  
                   Social/Behavioral Sciences

\* \* \* \* \*

**TYPE OF PROPOSAL (Check ALL that Apply)**

<input type="checkbox"/> General Education <input type="checkbox"/> New Course in <input type="checkbox"/> Bank <input type="checkbox"/> Existing course, Add To <input type="checkbox"/> Bank <input type="checkbox"/> Multicultural/Global Designation <input type="checkbox"/> Writing Intensive Designation  <input type="checkbox"/> New Minor/Concentration/Specialization <input type="checkbox"/> New Major/Degree Program <input type="checkbox"/> Short Term Course Proposal	<input checked="" type="checkbox"/> New Course (NOT Gen. Ed.) <input type="checkbox"/> Name Change (Dept., School, Major) <input type="checkbox"/> Changes in Degree Requirements <input type="checkbox"/> Changes Involve Gen. Ed. requirements  <input type="checkbox"/> Minor Changes to Existing Courses <input type="checkbox"/> Course is NOT General Education <input type="checkbox"/> Course IS General Education
--	---

**DEPARTMENT**

(SIGNATURE INDICATES APPROVAL)

[Signature]      10/22/98  
 DEPT. CURRICULUM CHAIR / DATE

[Signature]      10/22/98  
 DEPT. CHAIRPERSON / DATE

**COLLEGE CURRICULUM COMMITTEE**

DATE OF OPEN HEARING (if necessary) \_\_\_\_\_

APPROVED  
 NOT APPROVED  
 COMMENTS:

[Signature]      2/14/99  
 SIGNATURE      DATE

**ACADEMIC DEAN (& GRADUATE DEAN, for New Graduate Programs Only)**

APPROVED  
 NOT APPROVED  
 COMMENTS:

[Signature]      18/23/98  
 SIGNATURE (Academic Dean)      DATE

\_\_\_\_\_  
 SIGNATURE (Graduate Dean)      DATE

**UNIVERSITY CURRICULUM COMMITTEE**

DATE OF OPEN HEARING (if necessary) 3/10/99 (College level only)

APPROVED

NOT APPROVED

COMMENTS:

Paula Reeves

4/1/99

SIGNATURE

DATE

**SENATE**

Date announced at Senate 3/23/99

Voted upon at Senate:

Approved

Not Approved

Date:

**EXECUTIVE VICE PRESIDENT/PROVOST**

APPROVED

NOT APPROVED If no, reasons are as follows:

STUDENT CREDIT HOURS \_\_\_\_\_ FACULTY LOAD HOURS \_\_\_\_\_ EQUALIZED CREDIT HOURS \_\_\_\_\_

OFFICIAL COPY & APPROVAL SHEET FILED (DATE): \_\_\_\_\_

DATE/SIGNATURE EXECUTIVE VICE PRESIDENT/PROVOST C. J. Mott

**REGISTRAR**

DATE APPROVED COURSE DESCRIPTION RECEIVED \_\_\_\_\_

HEGIS TAXONOMY & COURSE NUMBER ASSIGNED 0901.241

DATE/SIGNATURE OF REGISTRAR Robert A. Kulat 4/6/99

**NOTIFICATION FORWARD:**

SENATE CURRICULUM COMMITTEE CHAIRPERSON

DEPARTMENT CHAIRPERSONS

ACADEMIC DEAN(S)

REGISTRAR

SPONSOR(S)

TM 4/22/99

## Course Proposal

### 1. Details

- a) Course Title: Machine Design (0910.241) ✓
- b) Sponsor: Dr. Jawaharlal Mariappan and School of Engineering Curriculum Committee
- c) Credit Hours: 2 Credit Hours
- d) Course Level: Senior/Junior for Mechanical Engineering
- e) Curricular Effect: Required course for mechanical engineering majors
- f) Prerequisites: Dynamics (0901.291) and Solid Mechanics (0901.272)
- g) Suggested Time: Fall 1999, and from 2000 onwards in Spring
- Scale of Implementation: One section
- h) Resources: Faculty: Existing faculty can teach this course  
Library: No library acquisitions will be used  
Equipment: Laboratory equipment and apparatus will be required.  
Computers: Computer laboratory access and additional software will be required.

### 2. Rationale:

The proposed course is part of the Engineering Curriculum Proposal approved by the College Senate in December 1994. The proposed course is consistent with the establishment of the School of Engineering approved by the Board of Trustees in February 1995. The proposed course is a core requirement for Mechanical Engineering disciplines. The proposed course meets the Engineering Topics requirement of the Accreditation Board for Engineering and Technology (ABET) for engineering programs.

Machine design is an essential course for all mechanical engineering students. It deals with the design and analysis of basic machine elements and power transmission components.

### 3. Essence of the Course:

#### a) Objectives

Upon completion of the course, students will be able to

1. Understand issues involved in machine design.
2. Design and analysis of machine elements such as springs, bearings, screws, fasteners, shafts, couplings, clutches, brakes, gears, belts and chains.
3. Selection of machine elements.

4. Apply CAE software packages for design analysis.
5. Implement a machine design project.

**b) Topical outline**

The topics to be covered are listed below. The instructor will supply the students with a syllabus during the first week of classes. The instructor will assess any technology advances in the subject matter prior to the course and make topic changes deemed to be appropriate to maintain the level and currency of instruction.

Introduction to Design

- Design case studies
- Stress, strain, and deflection
- Failure theories

Machine Design

- Shafts, keys and couplings

Bearings and Lubrication

Gears

- Gear terminology and forces
- Spur, helical, bevel, and worm gears
- Gear trains and transmission

Springs

Screws and fasteners

Clutches and brakes

**c) Evaluation and Grading Procedure of Students:**

Student grades will be determined on the basis of examinations, homework, laboratory assignments, projects and reports. A course syllabus with stated method of arriving at the final grade, e.g., number of exams, homework, projects, percentage of grade, will be distributed to the students during the first week of classes.

**d) Course Evaluation:**

The proposed course will be evaluated on the basis of student evaluations and curriculum review by appropriate faculty.

**4. Results of Consultations:**

The proposed course is part of the Engineering Curriculum Proposal approved by the Faculty Senate in December 1994. Consultations were submitted with original proposal as specified by the Curriculum Committee.

**Catalog Description:**

**Machine Design (0910.241)**

*Prerequisites: Dynamics (0901.291) and Solid Mechanics (0901.272)*

This course introduces the students to machine design. It deals with the design and selection of machine elements such as shafts, couplings, bearings, gears, springs, clutches, brakes, screws, and fasteners. Laboratory experience will include computer simulation and analysis. Design experience will be synergistically integrated throughout the curriculum and culminate in a design project.