

# DEPARTMENT OF MECHANICAL ENGINEERING GRADUATE PROGRAMS



## MASTER OF SCIENCE IN ENGINEERING AND MASTER OF ENGINEERING PROGRAMS

Graduate programs leading to the degrees of Master of Science in Engineering and Master of Engineering are offered to students with baccalaureate degrees. The objective of these programs is to enhance the student's professional skills through a deeper understanding of the fundamental principles of mechanical engineering and their applications. The Master of Science in Engineering degree requires a thesis and offers the opportunity for independent investigation and creative research. The Master of Engineering degree does not require a thesis, but requires nine more hours of course work than the thesis program.

### Admission

An applicant must have a baccalaureate degree in engineering from an accredited institution and a minimum score of 600 on the Quantitative Section of the GRE General (aptitude) Test. Applicants also must satisfy the general admission requirements of the Graduate School. All applicants from non-English speaking countries who have not received B.S. degrees from U.S. universities must demonstrate English proficiency by making a Test of English as a Foreign Language (TOEFL) score of at least 550.

An undergraduate grade-point average of at least 3.0 is normally required. However, a student who does not satisfy this requirement but has at least a 3.0 grade-point average in his or her major field may be admitted on probation at the discretion of the Graduate School. Probationary status is removed by completing nine hours of approved graduate study with a 3.0 grade-point average within a specified time period.

### Requirements

Upon completion of the thesis, the student must pass a comprehensive oral examination. The other

requirements for the thesis program and two sample thesis programs are shown below.

## MASTER OF SCIENCE THESIS PROGRAM

Minimum semester hours in Mechanical Engineering, excluding thesis.....	12 hours
Minimum semester hours outside Mechanical Engineering.....	6 hours
Semester hours of thesis.....	6 hours
Minimum semester hours of at least 7000 level, (excluding thesis) including one graduate level thermal/fluids course and one solids course.....	15 hours
Minimum semester hours of 6000- or 7000-level Mathematics.....	3 hours
Maximum semester hours of approved 6000-level (senior elective) courses.....	9 hours
Maximum semester hours of independent study.....	3 hours
Minimum total hours.....	30 hours

## SAMPLE M.S. COURSES/PROGRAMS

### General Popular Courses:

Math 6543	Intro.To Partial Differential Equations
Math 7273	Numerical Differential Equations
ME 7986	Research and Thesis
ME 7863	Special Topics in ME
ME 7993	Independent Study

### Thermo-Fluids Emphasis

ME 7023	Conduction Heat Transfer
ME 7033	Boundary Layer Theory
ME 7043	Gas Dynamics
ME 7133	Turbulent Flow
ME 7543	Computational Fluid Mechanics
ME 7573	Convection Heat Transfer
PE 7053	Two Phase Flow Modeling
ChE 7003	Fluid Mechanics
ChE 7023	Thermodynamics
ChE 7043	Heat and Mass Transfer

### Solids Emphasis

ME 7093	Intro. To Finite Elements Methods
ME 7103	Theoretical Vibration
ME 7143	Theory of Elasticity
ME 7163	Structural Fatigue
ME 7173	Experimental Stress Analysis
ME 7223	Fracture Mechanics
ME 7283	Mechanics of Composite Materials
ME 7353	Placticity
ME 6453	Mechanical Control Design
ME 7123	Acoustics

## DOCTOR OF PHILOSOPHY



The principal objectives of the Ph.D. program are to provide a thorough understanding of the scientific and engineering principles underlying the students' fields of interest, to develop the ability to apply these principles creatively to engineering problems, and to develop research skills.

### Admission

Applicants are selected for admission to the Ph.D. program on a competitive basis. The number of qualified applicants selected each year depends on the number of students already in the program. Qualified applicants must meet the minimum requirements as stated below:

An applicant must have a baccalaureate or master's degree in engineering from an accredited institution. A student without a Master's degree must meet the requirements for admission to the master's program. To qualify for the Ph.D. program, an applicant must have at least a 3.5 grade-point average in the first thirty hours of graduate work and approval of the department graduate faculty and the Graduate Dean.

All Applicants must take the General Tests of the Graduate Record Examination prior to admission. Applicants must make a minimum combined (quantitative and verbal) score of 1100, with a minimum quantitative score of 700. All applicants from non-English speaking countries who have not received B.S. degrees from U.S. universities must demonstrate English proficiency by making a Test of English as a Foreign Language (TOEFL) score of at least 550.

### Requirements

A written qualifying examination must be taken in the second semester of study. Each candidate must write a dissertation and pass an oral examination on the results of his or her research. The dissertation must demonstrate the candidate's abilities in independent investigation and advance the art and/or science in a field of mechanical engineering.

A minimum total of 72 hours graduate credit above the baccalaureate level, including 24 hours of thesis and research and dissertation, is a degree requirement.

The University of Tulsa has an Equal Opportunity/Affirmative Action Program for students and employees.

## MECHANICAL ENGINEERING FACULTY



**Edmund F. Rybicki**, Chairman, Ph.D., P.E., ASME Fellow, Case-Western Reserve University, erosion/corrosion, composite materials, residual stresses in welds and thermal spray coatings.

**John M. Henshaw**, P.E., Ph.D., University of Delaware, engineering design, composite materials, materials engineering, alternative-fuel transportation.

**Michael R. Kessler**, Ph.D., University of Illinois, polymer matrix composites, biologically inspired materials, experimental solid mechanics and fracture.

**Brenton S. McLaury**, Ph.D., The University of Tulsa, erosion (experimental and analytical), gas-solid flows, liquid-solid flows, computational fluid dynamics and heat transfer.

**Ram S. Mohan**, Ph.D., University of Kentucky, manufacturing processes and systems, controls systems, robotics and instrumentation, high pressure fluid applications, multiphase separation technology.

**John R. Shadley**, Ph.D., P.E., University of Houston, dynamics, acoustics, vibration, erosion/corrosion, residual stress measurement.

**Siamack A. Shirazi**, Ph.D., P.E., University of New Mexico, CFD, turbulent flow, solid/liquid/gas flow, erosion/corrosion, LDV/PDA.

**James R. Sorem, Jr.**, Ph.D., P.E., Senior Associate Dean, University of Kansas, computer-aided engineering, solid mechanics, experimental and residual stress analysis.

**Steven M. Tipton**, Ph.D., P.E., Stanford University, fatigue of engineering materials, engineering design, materials and materials processing, coiled tubing mechanics.

For further information contact:

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