

Brad Hill, MS in RME, 2012
Reliability & Maintainability Métier Manager
at Schlumberger

Brad Hill started to pursue his MS in RME after several years of being a field engineer at Schlumberger Technology Corp. The flexibility of the MS program allowed him to continue working during normal business hours and take courses online in the evenings. The RME MS degree helped him build a solid foundation in reliability and maintainability through coursework in reliability, maintainability, statistics, and systems engineering. For his final project, he did a recurrence analysis to get a better understanding of the reliability of a few of Schlumberger's products. Since completing the degree in 2012, He has been working as the Reliability & Maintainability Métier Manager at Schlumberger's Houston Formation Evaluation Center, where he is responsible for ensuring that reliability and maintainability are incorporated into product design. In the above photo, Brad was next to a chamber where a Highly Accelerated Life Test is performed to understand the operating margins and limits of designs.



Eric Strong, MS in RME, 2013
Pursuing a PhD in Nuclear Engineering at UT

Eric Strong has been investigating the usefulness of fault codes, also called error or alarm codes, obtained from built-in self-tests in predicting the remaining useful life of monitored components. Increased numbers of fault codes before or during operation can be indicative of degradation. The information contained in fault codes can also be integrated with existing degradation parameters for higher accuracy in estimation of remaining useful life.



Victor Foster, BS with RME Certificate, 2008
Senior Reliability Engineer at Cargill

Victor Foster got into reliability through an RMC summer internship at DuPont. His wife and he decided to take jobs as Maintenance and Reliability Engineers with the Dow Chemical Company after getting their BS degrees. After working at two different plastic manufacturing facilities within Dow, he took a position at a RockTenn paper mill as a reliability engineer. As the first reliability engineer the site had ever had, he was able to implement several new programs and revitalize existing reliability initiatives. As the reliability engineer, he participated in a reliability audit with the division's leadership. He soon had the opportunity to be promoted to the Mechanical Reliability Leader for the division. Now he is the senior reliability engineer for Cargill, where he is in charge of the site's reliability engineers and contract predictive maintenance services.



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Reliability and Maintainability Engineering



GUIDE FOR PROSPECTIVE STUDENTS

www.engr.utk.edu/rme

RELIABILITY AND MAINTAINABILITY ENGINEERING

About the Program

The Reliability and Maintainability Engineering (RME) program is a multidisciplinary program focusing on the use of management systems, analysis techniques, and advanced condition-based and preventive technologies to identify, manage and eliminate failures leading to losses in system function. Once perceived as a practitioner or manufacturing issue, reliability and maintainability engineering is now considered a business issue of urgent priority. The program was initiated through a close association with the Reliability and Maintainability Center, which was established in 1996. The center is a unique partnership between academia and industry dedicated to improving productivity, efficiency, and safety through the development and application of maintenance and reliability technologies and management principles.



Dr. Mingzhou Jin
RME Director

Master of Science Degree in RME

The Master of Science (MS) degree in RME consists of 30 hours. There are thesis and non-thesis options. The program can be completed on campus or through real-time and interactive distance delivery.

Admissions Information

- Applicants for admission must have a bachelor's degree from an accredited undergraduate program in engineering or science.
- The student may choose a concentration in one of the six traditional engineering areas:
 - Chemical and Biomolecular Engineering
 - Electrical Engineering and Computer Science
 - Industrial and Systems Engineering
 - Materials Science and Engineering
 - Mechanical, Aerospace and Biomedical Engineering
 - Nuclear Engineering
- Students from other disciplines may be admitted, but may be required to take additional engineering courses.
- All applicants to the RME Master of Science program and Graduate Certificate must apply through the University of Tennessee Graduate School:
graduateadmissions.utk.edu

The program is part of the Academic Common Market. If you live in Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, Virginia, or West Virginia, you are qualified for in-state tuition. For details, visit:
home.sreb.org/acm/ProgramDetail.aspx?id=1851.

Thesis Option

Minimum of 30 semester hours including:

- 12 hours of RME core courses
- 6 hours of required statistics sequence
- 3 hours of RME elective courses or statistics electives

- 3 hours in engineering, statistics, business management
- Thesis – 6 hours through the department of the major professor.
- A final oral examination covering the thesis and related course work, which must be done on the UT campus

Non-Thesis Option

Minimum of 30 semester hours including:

- 12 semester hours of RME core courses
- 6 hours of required statistics sequence
- 6 semester hours of RME elective courses or statistics electives
- 3 hours in engineering, statistics, business management
- Project in lieu of thesis (3 hours). A written final report is required.
- A final oral examination covering the project and related coursework. The final oral examination must be on the UT campus.

Note: At least two-thirds of the minimum required hours must be taken in courses numbered at or above the 500 level.

RME Core Courses

Introduction to Reliability Engineering (CBE/IE/ME/MSE/NE 483)

Introduction to Maintainability Engineering (CBE/IE/ME/MSE/NE 484)

Process Systems Reliability & Safety (CBE/NE 585)

Reliability of Lean Systems* (IE 517)

Statistics Sequence

Introduction to Mathematical Statistics* or Statistical Methods in Industrial Engineering (IE 516)

Survival Analysis* (STAT 567)

RME Electives

Linear Algebra in Engineering Systems (CBE/IE/ME/MSE/NE 529)

Random Process Theory for Engineers (ECE 504)

Optimization Methods in Industrial Engineering* (IE 522)

Mechanical Vibrations* (ME 534)

Equipment and Systems Prognostics* (NE 575)

Empirical Models for Diagnostics* (NE 579)

Statistics Electives:

Data Mining & Business Analytics (STAT 474)

Statistics for Research I* (STAT 573)

Statistics for Research II* (STAT 574)

Applied Time Series (STAT 575)

Applied Multivariate Methods* (STAT 579)

*Currently offered through distance education.

All courses are 3 hour courses.

Graduate Certificate in RME

The RME Graduate Certificate program is an interdepartmental initiative designed for students who wish to pursue careers in Reliability and Maintainability Engineering. It is also suitable for professionals and managers currently working in the field looking to improve their knowledge and skills.

The program consists of four graduate engineering courses, two required courses and two elective courses. The two required courses introduce the student to the fundamentals of maintenance engineering and reliability engineering. The two elective courses are selected from a list of RME-related courses that currently includes courses in five traditional engineering disciplines.

RME Undergraduate Minor

Fifteen hours of coursework are required as listed below. The grade in each of the required classes must be at least a C.

Core Courses (6 hours)

Introduction to Reliability Engineering

Introduction to Maintainability Engineering*

Statistics or Math Requirement (3 hours, choose 1)

Che 301, ECE 313, IE 200, MATH 323, STAT 251

Engineering Electives (6 hours, choose 2)

CBE 360, ECE 315, ECE 471, IE 300, STAT 340, ME 345, ME 363, MSE 302, MSE 405, NE 351, NE 401, IE 340

Reliability and Maintainability Center

The Reliability and Maintainability Center (RMC) exists to advance reliability and maintenance education and practices within the academic and industrial communities. The RMC creates opportunities for member companies and organizations, students, faculty, and industry to achieve exceptional value through a comprehensive program of education, research, and information sharing.

The RMC currently has about fifty member companies and organizations, such as ABS Consulting, AEDC, Amazon, Bayer, DuPont, Dow, Eastman Chemical Company, Emerson, Georgia Pacific, GM, Nissan, ORNL, Swagelok, US Army-AMRDEC, etc. Each summer, the RMC places many RME graduate and undergraduate students in internships with member companies.

The RMC also offers the Reliability & Maintainability Engineering Implementation Certificate that is designed for working professionals and provides the most hands-on and practical maintenance and reliability education offered.

www.rmc.utk.edu

