

Clemson University Libraries

Automotive Engineering Information Access Policy

Engineering Librarian:
Jan Comfort

Written by J. Comfort, 9/10

The Clemson University Board of Trustees approved the creation of the Automotive Engineering Department in Summer 2010, using existing staff, equipment and facilities. The unit previously was managed autonomously through Clemson's Mechanical Engineering Department. The Department will continue to offer both masters and doctoral degrees in Automotive Engineering and conduct automotive-focused industry- and government-sponsored research. It currently has 114 graduate students and 12 faculty members.

The MS and PhD degrees in Automotive Engineering prepare a new generation of engineers to deal with the complex technological, environmental and globalization issues facing the automobile industry. The big challenge facing the industry is the integration of diverse technologies in the automobile and its cost effective and environmentally responsible manufacture, all being done in a global network with people of different backgrounds and cultures. The Automotive Engineering programs equip students with the basis, depth and domain knowledge needed for masters and doctoral-level expertise in systems integration and vehicle systems engineering and the ability to work globally. Graduates of the program are able to lead teams of culturally diverse individuals to produce an integrated automobile platform or to work in research laboratories involved with the design of new products in the automotive field. While the program is geared toward the automobile industry, it produces strong linkages with the aerospace and other industries within the state, region and nation as some of the challenges faced by the automotive industry are also faced in other sectors.

Doctor of Philosophy

Students are admitted into the PhD program in the fall, spring and summer terms. Minimum admission requirements include a bachelor's or master's degree in a recognized relevant engineering or science discipline. Students entering the program directly with a BS degree must meet the entrance requirements for the MS degree and have a grade-point ratio of 3.5 or higher in their undergraduate programs. Students with an MS degree in a recognized relevant engineering or science discipline are not subject to the two years of post baccalaureate full-time industrial experience requirement.

See Appendix 1 for an overview of the curriculum and Appendix 2 for a list of courses.

Program requirements are as follows:

Core Courses—AU E 880, 881, 882

Automotive Engineering Track—minimum of six hours (two AU E courses from two track areas. Tracks listed in below)

Discipline-Specific Courses—no minimum requirements, typically five additional courses

Business or Related Field—minimum of 3 hours in a directed, nontechnical field

Technical Courses—minimum of 9 hours in a concentration area outside the discipline or a technical minor

Dissertation—18 credit hours

Foreign Residency Requirement—six-month residency at a foreign research laboratory or university

Master of Science

Coursework

Admission to the MS program occurs in the fall semester only. Students are required to hold a BS degree from a recognized relevant engineering or science discipline and the equivalent of two years of post baccalaureate full-time work experience in industry. Students have the opportunity to tailor the program either in the functional aspects or systems aspects (stems) of automotive engineering through appropriate course choices.

See Appendix 1 for an overview of the curriculum and Appendix 2 for a list of courses.

The program is divided into four content areas, consisting of 36 credit hours of coursework and six hours of project work, as follows:

Core Courses—AU E 880, 881, 882, 883

Automotive Engineering Track—18 credit hours in two or three track areas with nine hours in automotive engineering courses and nine hours based on the student's interests and specialization.

Track Areas of Specialty:

- T1 Vehicle Materials and Structures Mechanics
- T2 Vehicle Electronics, Mechatronics and Computer Systems
- T3 Vehicle Design and Integration, Methods and Tools
- T4 Vehicle Manufacturing and Production
- T5 Vehicle Performance (Vehicle Physics)
- T6 Vehicle Power Systems and Transmission

Business or Related Field—a minimum of six hours in a concentration area or minor approved by the advisory committee

Internship—a six-credit-hour internship of six months duration in an industrial setting

Foreign language proficiency is required as an outcome of the program.

Deep Orange (Research)

Deep Orange is a framework at CU-ICAR to pioneer research on future mobility and to educate tomorrow's engineer today. Each academic year, a new two-year project is begun to develop a unique vehicle that targets a specific market segment.

Campbell Graduate Engineering Center (CGEC) at CU-ICAR

All coursework and research projects are based at CGEC. In addition, there is a small Library (which they call a "Media Center") on the 4th floor. This Library is administered by the Clemson University Libraries. It is open and available by key access to all students. Although there is no formal staffing, a CGEC IT Staff Member has an office in the space. The Engineering Reference Librarian makes occasional visits to meet with students and to manage the small collection of print materials. Holdings (expect for older textbooks donated by faculty members) are listed in the Libraries' Catalog. Members of the public and visitors must make prior arrangements with the CGEC IT staff or Engineering Librarian for access.

College of Engineering and Science Centers, Alliances, and Affiliated Institutes

Research and innovation continue to be driving factors as Clemson University climbs in the *U.S. News & World Report* rankings. With advanced technology and state-of-the-art laboratories, Clemson provides an environment where researchers and industry professionals can come together to create ideas for the future.

For years, Clemson has created and nurtured research and economic development centers to build a knowledge-based economy. Clemson's more than 100 centers and institutes are dedicated to everything from automotive excellence to advanced materials, from international diversity to community outreach, from ethics to the arts. The link between academics and industry grows stronger every day.

See Appendix 3 for a list of Centers, Alliances, and Affiliated Institutes in the College of Engineering and Science.

Clemson University Emphasis Areas

<http://www.clemson.edu/administration/provost/emphasisareas.bbsea.html>

Instead of assigning all of the financial resources to departments and colleges, Clemson instead focuses on programmatic areas that provide interdisciplinary research and service venues, unique platforms for enhanced scholarship, and more opportunities for graduate and undergraduate students. Clemson University has identified eight emphasis areas, which are the foundation for the Academic Plan. The College of Engineering and Sciences has a stake in five of these emphasis areas.

- Advanced Materials *
- Automotive and Transportation Technology *
- Biotechnology and Biomedical Sciences *
- General Education
- Family and Community Living
- Information and Communication Technology
- Leadership and Entrepreneurship
- Sustainable Environment

*Several collections have been purchased to particularly support these Emphasis areas: Historical files in Engineering Village, and the Referex collection of e-books (Elsevier) for Advanced Materials; POLYMERSnetBASE (CRC Press) for Advanced Materials; additional technical reports in the SAE Digital Library for Automotive Engineering; Rosetta Stone language learning for Automotive Engineering. ***See Appendix 4 for a list of faculty research interests***

1. Purpose of Collection:

To support the teaching, research, and information needs at the graduate level in Automotive Engineering.

Primary Users:

- Graduate students pursuing either the MS or PhD degree in Automotive Engineering, located at the Campbell Graduate Engineering Center (CGEC) at CU-ICAR
- Automotive Engineering faculty
- Clemson University Centers and Institutes - these in particular:
 - Automotive Safety Research Institute (CU-ASRI)
 - Center for Motorsports Excellence
- Employees at companies who are affiliated or are in partnerships with CU-ICAR, including Timken, Michelin, and BMW.

Secondary Users:

- Students and faculty of departments whose subjects overlap with the interests of Automotive Engineering, especially Mechanical Engineering, Civil Engineering (Transportation), Materials Science, and Psychology
- Researchers, faculty and students at other South Carolina institutions
- Researchers and Engineers at South Carolina companies

2. General Collection Guidelines:

In addition to the main collection in R.M. Cooper Library, materials are also selected for the Library at CGEC. All items (except for the collection of old textbooks that were donated by AE faculty) are cataloged and barcoded and are listed in the Libraries catalog with the location of CGEC. All items are non-circulating. Students are expected to record the title and bar code of any book that they remove from the Library for use in the building.

In general, items that are highly technical and/or specific to the AE program will be added to the collection at CGEC. Items that are more general or more interdisciplinary will be purchased for the Cooper collection.

Scope of the Collection - Materials will be selected in electronic formats when available

- Reference Books, including handbooks, dictionaries, and encyclopedias
- Monographs – print and electronic – will be selected to support the research and coursework of graduate students as well as the research and teaching needs of the faculty. E-book packages from Knovel and Springer are especially valued. During budget crisis times (such as now) books will be chosen very selectively, primarily in response to requests from faculty and students. A formal analysis of the monographs collection will begin in Spring 2011.

- Language learning materials – because the automotive engineering program is off-campus, it has been difficult for them to address their language proficiency requirement. We agreed to offer access to Rosetta Stone for their students for one year (now renewed for a second year.)
- Industry standards play an important role in the research process. Therefore, we will maintain a subscription to ASTM standards, and bibliographic access to additional standards through ANSI. Standards will be purchased on an as-needed basis, with a budget of \$5,000. per year.
- Journals /serials / periodicals will be selected to support undergraduate research and coursework, and to support graduate and faculty research. General interest titles and trade publications generally are included in Aggregators (databases such as Academic Search Premier, Lexis / Nexis, and General Business file, so will not be purchased individually.

See Appendix 5 for a list of Important Journals in Automotive Engineering.

- The primary databases supporting Automotive Engineering are: SAE Digital Library, Engineering Village (Compendex, Engineering Index historical, and Inspec), SciFinder Scholar, Medline, IEEE Xplore, ASME Digital Library, and Web of Knowledge (Science Citation Index and Inspec)
- Textbooks used in Clemson classes will not be purchased, unless they are deemed to be useful for other reasons. Nor can Clemson textbooks be borrowed on Interlibrary Loan. However, because a number of textbooks were donated by Automotive Engineering faculty, they have been added to the collection at CGEC. The records are suppressed, so they do not display in the catalog.

Languages

Unless specifically requested by a faculty member, all material will be written in English.

Date of Publication

Most materials purchased will have been published within the preceding two years. Older works will be purchased at the request of a faculty member, to replace heavily-used volumes that have been lost, or for which demand has been shown through Interlibrary Loan borrowing.

Geographical Guidelines

I recognize the global nature of research, and the importance of representing a wide variety of points of view and international perspectives. However, due to serious budget constraints, materials originating/published in the United States will be the primary focus.

Format

Wherever possible, reference works, indexes, and journals will be purchased in electronic format and made available from the Libraries' Web site for access by students and faculty, on and off campus. Print materials will also be selected. Micro formats will be purchased if it is the only format available. Appropriate materials will be purchased on CD-ROM or DVD, when requested by a faculty member.

LibGuides

A LibGuide for Automotive Engineering is linked on the LibGuides home page as well as the "Research by Subject" page.

3. Access to Information Not Available at Clemson

Interlibrary Loan

The primary means of access to materials not owned or accessible by the library is Interlibrary Loan, a service available free to Clemson University students, faculty, and staff.

PASCAL Delivers

Books available from other research institutions in South Carolina can be supplied by Pascal Delivers, also free to Clemson University students, faculty and staff.

4. Selection, Evaluation, and Assessment Tools:

- Faculty requests and recommendations
- Review sources, e.g. *Choice*
- Approval slips from YBP ensure notification of titles that fit the needs of the library's circulating collection. The approval plan is reviewed yearly to ensure the plan is efficient.
- Publishers' catalogs
- Vendor's databases (GOBI)
- Indexes, bibliographies, and series lists
- Teaching and research interests of the Automotive Engineering faculty
- *Books for College Libraries*
- Interlibrary loan activity
- Circulation activity

5. Deselection (Weeding) Guidelines

Books will be weeded from the collection if they are in poor condition and cannot be repaired. A replacement copy will be purchased, if available, for important titles. Duplicate copies of books that have not circulated will also be considered for weeding. Material that is clearly outdated and not of historical interest will also be considered for weeding.

6. Summary of Primary Subject Classifications, LC Call Numbers, and Collecting Levels

(A detailed listing of keywords, subject headings, faculty research interests and courses is in progress)

Subject	LC Class	Collecting Level	Location
Mechanical Engineering	TJ1 – TJ1519	undergraduate/graduate	Cooper
Motor Vehicles	TL1 – TL484	undergraduate/graduate	Cooper
Automobiles	TL1-296.5	undergraduate/graduate	Cooper & CGEC
Automobiles—Design and Construction	TL240-278.5	undergraduate/graduate	Cooper & CGEC
Automobile Industry and Trade	HD9710-9710.37	undergraduate/graduate	Cooper & CGEC

Appendix 1

THE AUTOMOTIVE ENGINEERING MASTERS PROGRAM OVERVIEW:

1- Automotive Engineering Master Degree Requirements

Credit Hrs:
Program Duration:
Course Requirements:
Internship:

42 credit hours
24 Months (4 semesters = 3 on campus semesters + 1 internship semester)
12 Courses (36 credit hours)

A six-month (6 cr hrs of AuE 890) approved internship/project is required; the 6 cr hrs don't have to be continuous & can be taken with other courses. However a student can't receive more than an equivalent of 1 cr (AuE 890) per month of study
A foreign language proficiency (other than English) is considered a graduation requirement, evaluated by one of following:
(I) Passing three language classes (101, 102, and 201) with B or better. OR
(II) Passing an approved placement test with intermediate score (consult your advisor for list of approved tests), OR
(III) For students with international internship, their advisor can testify to their proficiency through official communication

Additional Requirements:

2- Automotive Engineering Master Degree Stems:

Two automotive master degree options are available: System and Function Stems

1. Function Stem Objective:

To meet primarily the needs of the automotive tier 1 and tier 2 suppliers for individuals with knowledge and skills to integrate two or more technical areas

2. System Stem Objective:

To meet primarily needs of automotive OEMs for individuals having knowledge & skills to manage & integrate people, technologies, and suppliers at different stages of the vehicle development/production process chain.

Please Note:

System stem courses are also considered technical AuE courses from the different tracks

3- Common Course Requirements

Required For the Two MS AuE Program Stems = 6 core courses (18 hrs) + 2 minors (6 hrs)

6 Core Courses (18 credit hours)

- AuE 880 - Design/Manufacture Project Management
- AuE 881 - Automotive Systems- an integrated overview
- AuE 882 - Systems Integration Concepts and Methods
- AuE 883 - Applied Systems Integration
- AuE 833 - Automotive Manufacturing Process Development
- AuE 835 - Vehicle Electronics Integration

2 Dedicated Minor Courses (6 credit hours)

Minor 1 - Graduate level class outside the college of engineering to cover: Organizational, Human, or Accounting management, Minor 2 - Graduate level class outside the college of engineering to cover: Policy, Globalization, or Business Administration

Objectives of Core Courses

To provide the students with the foundations in automotive systems.

Objectives of Minor Courses

To provide the students with the foundations of business, economics, politics etc. as pertinent to the automotive industry.

4- Other MS AuE Systems Stem Courses:

- AuE 831 - New Vehicle Conception, Market and Technology Identification, Concept Validation (C6)
- AuE 832 - Vehicle Development and Integration Processes, Methods and Tools (C1)
- AuE 833 - Automotive Manufacturing Process Development, Methods and Tools (C2)
- AuE 834 - Automotive Production Preparation, Management and Launch (C3)
- AuE 835 - Vehicle Electronics Integration - A Process Chain Prospective (C4)

Objectives of Systems-stem Courses

To provide the students with a more detailed knowledge and experiences as related to various stages in the vehicle development/production process chain.

5- Remaining Course Requirements for the Two MS AuE Program Stems

Function Stem

4 courses (12 credit ours) from 6 tracks listed below

System Stem Objective

4 courses (12 credit ours) from 6 tracks listed below
To provide the students with depth in two-to-three technical areas

Constraints

- At least 3 courses must have the AuE designation
- The courses must be taken from no less than 2 and no more than 3 tracks to ensure a depth/breadth balance.
- At least two courses must come from one track and at least two courses must come from another track

Tracks - Technical Areas

- T1 Vehicle Materials and Structures Mechanics
- T2 Vehicle Electronics, Mechatronics and Computer Systems
- T3 Vehicle Design and Integration, Methods and Tools
- T4 Vehicle Manufacturing and Production
- T5 Vehicle Performance (Vehicle Physics)
- T6 Vehicle Power Systems and Transmission

TRACK COURSES:

THE AUTOMOTIVE ENGINEERING MASTERS PROGRAM OVERVIEW:

1- T1 Vehicle Materials and Structures Mechanics

- * AuE 853 - Crash Analysis Methods and Crashworthiness
- * AuE 855 - Structural/Thermal Analysis Methods for Automotive Structure, Systems, and Components
- AuE 866 - Advanced Materials for Automotive Applications

2- T2 Vehicle Electronics, Mechatronics and Computer Systems

- AuE 835 - Vehicle Electronics Integration – A Process Chain Prospective (C4)
- AuE 826 - On Board Diagnostics and Reliability
- AuE 827 - Automotive Control Systems Design

3- T3 Vehicle Design and Integration, Methods and Tools

- AuE 846 - Tire Behavior and its influence on Vehicle Performance
- AuE 847 - Vehicle Suspension Systems Design and Analysis
- * AuE 849 - Automotive Chassis Design
- * AuE 875 - Vehicle Development and Realization
- AuE 877 - Light-weight Vehicle Systems Design
- * AuE 884 - Body and Interior Design
- * AuE 885 - Vehicle Layout Engineering and Ergonomic Design

4- T4 Vehicle Manufacturing and Production

- AuE 833 - Automotive Manufacturing Process Development, Methods and Tools (C2)
- AuE 867 - Vehicle Manufacturing Processes I
- AuE 868 - Vehicle Manufacturing Processes II

5- T5 Vehicle Performance (Vehicle Physics)

- AuE 832 - Vehicle Development and Integration Processes, Methods and Tools (C1)
- AuE 850 - Automotive Stability and Safety Systems
- * AuE 805 - Ground Vehicle Aerodynamics
- * AuE 886 - Vehicle Noise, Vibration and Harshness
- ** AuE 887 - Methods for Vehicle Testing

6- T6 Vehicle Power Systems and Transmission

- AuE 816 - Engine Combustion and Emissions
- AuE 817 - Alternative Energy Sources
- AuE 828 - Fundamentals of Drivelines and power-train Integration

7- Cross Listings will be identified

- ME 893/AuE 893 Advanced Vehicle Dynamics
- TBD

8- Special Topics in Automotive Engineering

- AuE 893
- Examples** Grounding and Shielding
- Lean Manufacturing & Design of Experiment
- Industrial Automation
- Advanced Engine Combustion and Emission
- Signal Processing

9- Internship / Project:

- AuE 890

10- Notes and Remarks:

- * Not to be Offered in 2009-2010
- ** Can be counted in all track courses

Semester			
Num.	Name	Course	Instructor
General Automotive Engineering Stream			
<i>Please, Refer to the Graduate Student Manual</i>			
Manufacturing Systems Engineering			
1st	Fall 2009	AuE 880 Design/Manufacture Project Management, 3cr. (3,0) AuE 881 Automotive Systems- an integrated overview, 3cr. (2,1) AuE 833 Automotive manufacturing Overview, 3 cr. (3,0) AuE 835 Vehicle Electronics Integration - A Process Chain Perspective C4	I. Haque/S. Hung P. Venhovens M. Omar T. Hubing
2nd	Spring 2010	AuE 882 - Systems Integration Concepts and Methods Minor 1, 3 cr. (3,0) AuE 868 Vehicle Manufacturing Processes II, 3 cr. (3,0) AuE 867 Vehicle Manufacturing processes I, 3 cr. (3,0)	S. Hung M. Omar L. Mears
3rd	Fall 2010	AuE 883 Applied Systems Integration, 3 cr. (3,0) AuE 866 Advanced Materials for Auto. AuE 893 Automation Minor 2, 3 cr. (3,0)	Hung/Venhovens Mears/Kurfess/Omar L. Mears
4th	Spring 2011	Internship / Deep Orange	
Performance Vehicles Specialization			
1st	Fall 2009	AuE 880 Design/Manufacture Project Management, 3cr. (3,0) AuE 881 Automotive Systems- an integrated overview, 3cr. (2,1) AuE 833 Automotive manufacturing Overview, 3 cr. (3,0) AuE 835 Vehicle Electronics Integration - A Process Chain Perspective C4	I. Haque/S. Hung P. Venhovens M. Omar T. Hubing
2nd	Spring 2010	AuE 882 Systems Integration Concepts and Methods AuE 846 Tire Behavior and its influence on Vehicle Performance, 3cr. (3,0) Minor 1, 3 (3,0) AuE 850 Automotive stability and safety systems, AuE 887 Methods for Vehicles	S. Hung T. Ryne B. Ayalew
3rd	Fall 2010	AuE 883 Applied Systems Integration, 3 cr. (3,0) AuE 827 Control systems AuE 828 Driveline & Powertrain, AuE 847 Vehicle Suspension Minor 2, 3 cr. (3,0)	Hung/Venhovens B. Ayalew/J. Ziegert I. Haque/J. Ziegert
4th	Spring 2011	Internship / Deep Orange	
Vehicular Electronics			
1st	Fall 2009	AuE 880 Design/Manufacture Project Management, 3cr. (3,0) AuE 881 Automotive Systems- an integrated overview, 3cr. (2,1) AuE 833 Automotive manufacturing Overview, 3 cr. (3,0) AuE 835 Vehicle Electronics Integration 3 cr (3,0)	I. Haque/S. Hung P. Venhovens M. Omar T. Hubing
2nd	Spring 2010	AuE 882 Systems Integration Concepts and Methods AuE 893 Automotive Signal Processing AuE 827 Control Systems Minor 1, 3cr. (3,0)	S. Hung T. Hubing/T. Kurfess B. Ayalew
3rd	Fall 2010	AuE 883 Applied Systems Integration, 3 cr. (3,0) AuE 893/ECE 693 Grounding and Shielding ECE 646 Antennas and Propagation, 3 cr. (3,0) or ECE 668 Embedded Computing 3cr. (3,0) Minor 2, 3 cr. (3,0)	Hung/Venhovens T. Hubing Martin Anthony Q H. Adam
4th	Spring 2011	Internship / Deep Orange	
Powertrain			
1st	Fall 2009	AuE 880 Design/Manufacture Project Management, 3cr. (3,0) AuE 881 Automotive Systems- an integrated overview, 3cr. (2,1) AuE 833 Automotive manufacturing Overview, 3 cr. (3,0) AuE 835 Vehicle Electronics Integration 3 cr (3,0)	I. Haque/S. Hung P. Venhovens M. Omar T. Hubing
2nd	Spring 2010	AuE 882 - Systems Integration Concepts and Methods Minor 1 3cr. (3,0) AuE 816 Combustion & Emission 3 cr (3,0) AuE 817 Alternative Energy Sources 3 cr (3,0)	S. Hung R. Prucka P. Pisu
3rd	Fall 2010	AuE 883 Applied Systems Integration, 3 cr. (3,0) AuE 893 Advanced Engine Combustion and Emission 3 cr (3,0) AuE 828 Fundamentals of Vehicle Drivelines and Powertrain Integration, 3cr. (3,0) Minor 2, 3 cr. (3,0)	Hung/Venhovens Prucka I. Haque
4th	Spring 2011	Internship / Deep Orange	

Class offerings subject to change

Last Updated:

August 12th, 2009

By: M. Omar

THE AUTOMOTIVE ENGINEERING PHD PROGRAM OVERVIEW:

TOPIC:

1- Automotive Engineering PhD Degree Requirements

- Credit Hrs:** 45 credit hours required, 60 credit hours typical
- Program Duration:** 48 Months
- Course Requirements:** 18 Courses (54 credit hours);
For students coming into the PhD program with MS in engineering, a portion of the course requirements may be waived.
- Research Thesis:** Dissertation, 18 credit hours.
- Additional Requirements:** For students lacking foreign language proficiency and a foreign cultural experience: a three-month (zero-credit-hour) cultural immersion with foreign language training course is required. In addition, a six-month (zero-credit-hour) overseas residency is required.
- Program Designation:** AuE

2- Automotive Engineering PhD Degree:

- Objective:** To produce highly-trained individuals working at the cutting edge of various disciplines which are critical for the automotive engineering industry.

Single PhD AuE Program Stem

3- Common Course Requirements

- 3 Core Courses (9 credit hours)**
(27 credit hours required),(42 credit hours Typical)
 - AuE 880 - Design/Manufacture Project Management
 - AuE 881 - Automotive Systems- an integrated overview
 - AuE 882 - Systems Integration Concepts and Methods
- 2 Track Courses (6 credit hours)**
 - AuE 833 - Automotive Manufactur Courses must come from different tracks.
 - AuE 835 - Vehicle Electronics Integration – A Process Chain Prospective (C4)
- 1 Minor Course (3 credit hours)**
- 3 Technical Minor Courses (9 credit hours)**
The technical minor must be integrated in student's PhD dissertation work.
- Courses in the Discipline**
(0 Courses, 0 credit hours required),(5 Courses, 15 credit hours typical)
- Objectives of Core Courses**
To provide the students with the foundations in automotive systems, project management, and systems integration methods, tools. And applications.
- Objectives of Track Courses**
To ensure that the student understands, at a minimum, applications of engineering and science to automotive engineering.
- Objectives of Minor Courses**
To provide the students with the foundations of business, economics, policies etc. as pertinent to the automotive industry.
- Objectives of Technical Minor Courses**
To provide the students with the knowledge of a technical concentration area outside the main technical discipline
- Objectives of Courses in the Discipline**
To provide the students with the fundamentals of the discipline(s) most pertinent to their PhD work.

Appendix 2

Automotive Engineering Courses

Core Courses

AuE 880 – Vehicle Design/Manufacture Project Management

Management, leadership, socio-cultural and technical skills training for the successful management of a development or research team. Problem identification, team dynamics, decision making, ethics, strategy setting, project planning, scope management and implementation, target costing, marketing, design methods, design for X concepts.

AuE 881 - Automotive Systems- an integrated overview

Understanding of the vehicle as a complex system and the role and interactions of the subsystems in terms of its performance. Topics discussed include propulsion systems, suspensions and steering systems, tire road interface, structural behavior and crash worthiness, materials and manufacturing, driver/occupants-vehicle interactions, and onboard electronics. Modeling and simulation is used as needed.

AuE 882 - Systems Integration Concepts and Methods

Methods and tools to handle functional, geometric, production and IT integration. Managing performance trade-offs from the combination of systems designed for individual functions. Optimization methods, complexity, validation, signal and IT design and testing methods, robustness, architecture, quality.

AuE 883 - Applied Systems Integration

Application of integration methods to practical and complex vehicle design and manufacturing systems. Prototyping, measurements, tolerancing and validation, Diagnosis and sensitivities, methods to diagnose sporadic software errors w/ hardware in the loop, design reviews, FMEA on function, signal, geometry, production. Fault tree analysis, innovation and change management, and risk analysis, value analysis.

Track Courses

AuE 805 - Ground Vehicle Aerodynamics

Basic and applied aspects of aerodynamics relevant for internal and external design for performance, including drag, handling, noise and ventilation. Wind tunnel and track testing methods and computational modeling approaches are utilized.

AuE 816 - Combustion, Emissions & Drivelines

Spark and compression ignition engines are investigated in terms of design, performance and emissions. Includes exergy models. Integrates theory of fuel air cycles with laboratory breakdown and dynamometer testing to correlate prevalent mathematic models with test results.

AuE 817 - Alternative Energy

Demand for petroleum alternative propulsion sources as focused attention on hybrid vehicles with fuel cells, electric motors and battery packs and internal combustion engines burning hydrogen and reformulated fuels. Comparison of performance, emissions, fuel efficiency, operational requirements and vehicle configurations is studied.

AU E 825 Automotive Sensors and Actuators

Study of automotive sensor and actuator requirements, design and selections as well as future needs. Sensor and actuator networks, noise and interference issues, wired and wireless systems are examined as well as integrated smart sensors and actuators with applications to traditional and intelligent vehicle systems.

AuE 826 - Diagnostics and Reliability

Discussion of legislated state, federal and international requirements. On-board automotive sensors to monitor vehicle operation and typical diagnostic algorithms are studied. Includes analytical methods for designing fault-tolerant systems and assessing vehicle reliability including safety-critical systems and "limp-home" modes, as well as use of hand-held scanners and specialized diagnostic equipment to classify faults.

AuE 827 - Automotive Control

Investigation into derivation of models and design of control strategies for powertrain and chassis control modules and integration into automotive platforms. Also presents software design, sensor selection, system architecture, diagnostics and reliability issues. Application is made to engine management, transmission and chassis systems with a consideration of vehicle performance, safety and information provision.

AuE 828 - Vehicle Drivelines

Study of vehicle powertrain arrangement, manual and automatic transmissions, automotive axles, four-wheel and two-wheel drives and design and manufacturing of gearing systems. Other topics, such as powertrain control to address dynamics in shifting, engine balancing and fuel economy, are addressed. Modeling and computer simulation are used extensively to analyze dynamic performance of various transmissions.

AuE 829 - Tire Behavior & Performance

In-depth analysis of the tire and its influence on vehicle performance including design, construction, structural response, rolling resistance, force and moment generation and behavior under dry/wet conditions. Tire models, their limitations and governing equations, tire characteristics on vehicle handling and safety and advanced control concepts in vehicle stability/braking are investigated.

AU E 832 Vehicle Development and Integration Processes, Methods and Tools

Overview of the vehicle development process and the tools used in it, including voice of the customer, concept creation, packaging, product specification and target setting, including cost structures, lifecycle product management, prototype development and the role of the supplier.

AuE 833 (1) - Manufacturing Overview

Overview of automotive manufacturing systems. Issues such as supplier integration, flexible manufacturing, aggregate planning, quality engineering and their applications to manufacturing systems are presented. Emphasizes opportunities and challenges presented with automotive manufacturing in a global environment, integrated processes, product development and automotive supply chain management.

AU E 834 Automotive Production Preparation, Management and Launch

Effective leadership and management of the product development and launch process. Includes responsibility and role definition, process management tools and software systems, detailed management of the supply chain, performance metrics and cost models and factors affecting launch success. Case studies of historic launch data and improvements are utilized.

AuE 835 (1) - Vehicle Electronics, Signal Processing

Addresses the integration of electronic components and systems in automotive designs. Provides an overview of the major electronic systems in automobiles and describes how automotive manufacturers specify, integrate and evaluate these systems.

AuE 847 - Suspensions, Steering, Braking

Study of concepts, theory, design and application of automotive suspension systems. Discusses suspension structure, configuration, geometry, kinematics, motion, static and dynamic load conditions as well as active, semi-active and passive systems. Suspension design factors and their effects are presented. Computer-aided engineering tools and other analytical techniques are demonstrated.

AU E 848 Vehicle Braking Systems

Study of vehicle braking performance; development of system specifications; regulatory, customer and manufacturing requirements; brake balance and effects on stability and stopping distance; ABS systems; and computer simulation for system performance.

AU E 849 Automotive Chassis Design

Integrative systems approach to the design and manufacture of automotive chassis and body components. Considers influence of design and manufacture on overall structural performance of the automobile, ride comfort, safety, durability, weight and cost.

AuE 850 - Stability and Safety Controls

Discussion of passive/active systems and design philosophies. Investigates stability issues associated with vehicle performance and use of sensors and control system strategies for stability enhancement. Implementation and application to intelligent cruise control, lane departure warning systems, ABS, traction control, active steering systems and vehicle dynamic control systems are also discussed.

AuE 853 – Crashworthiness

Consideration of crash legislation and testing; design constraints for crash; computational methods to analyze the mechanical response of automotive structure, systems and components to dynamic impact loading such as in crash situations; crush characteristics, structural collapse and their influence on safety; large-scale finite element analysis for large-scale deformation.

AU E 855 Structural/Thermal Analysis Methods for Automotive Structure, Systems and Components
Methods to analyze the response of automotive structure, systems and components to static, dynamic and thermal loading. Includes coverage of critical loading conditions and system response objectives. Analysis methods focus on finite element approaches supplemented by simple computational methods when appropriate.

AuE 866 - Advanced Materials

In-depth study of the broad range of engineering materials used in the construction of motor vehicles. Considers interrelations between materials microstructure, components manufacturing process and components service behavior.

AuE 867 - Manufacturing Processes (Supplier)

In-depth analysis of main component and subsystem prototyping, fabrication assembly and integration processes used during production of automotive vehicles. Also discusses design for manufacturing, computer-aided manufacturing and rapid tooling technologies.

AuE 868 - Manufacturing Processes (OEM)

Continuation of AU E 867 with more emphasis placed on opportunities and challenges presented by automotive manufacturing in a global environment, integrated processes and product development and flexible and agile manufacturing.

AU E 875 Vehicle Development and Realization

In-depth analysis of component and subsystems design, representation, data management and analysis for vehicles. Voice of the customer, customer-driven design, product design specifications, life cycle product management, CAD/CAE representations, domestic and international standards, prototyping, design review and supplier relationships are considered using case studies.

AU E 876 Mass Customization Design for Vehicles

Consideration of concepts of platforms and product families, identification of common functionalities and the translation of functions into forms taking commonality into consideration. Also investigates designing product families and their role in vehicle design, the tie between market needs and appropriate manufacturing paradigm and specific applications to vehicle systems designs: chassis, wiring harnesses, engines.

AuE 877 - Light-weight Design

Methodological approaches to weight tradeoff during design of vehicle systems, accounting for other functions, cost, safety, materials characteristics and manufacturing constraints. Includes topology optimization, multimaterial approaches and identification of the function optimal materials and material combinations using multi-objective formulations.

AU E 884 Styling Design

Considers fundamentals of styling design for the outer body and the interior cockpit. Utilizes concept sketching, drawing and prototyping, including virtual and physical, layered and clay based. Includes 2-D and 3-D representations, brand identifications, textures, materials, lighting, colors, and their use in automotive industrial design.

AU E 885 Vehicle Layout Engineering and Ergonomic Design

Study of vehicle layout specifications and considerations related to exterior and interior design. Ergonomics methods and tools as related to occupant accommodation and driver function are presented. Issues of assembly and manufacturing ergonomics are also covered. Case studies are utilized.

AuE 886 – Vehicle Noise, Vibration and Harshness

Application of engineering tools and specifications for noise, vibrations and harshness. Sources, mitigation methods, complexity and influences on other vehicle functions are considered. Utilizes design, simulation and validation methods.

AuE 887 - Vehicle Testing

Investigates test planning for various performance regimes, data acquisition and analysis, uncertainty analysis, sensor selection, noise filtering, data reduction methods and track testing methods. Project includes actual vehicle tests.

AuE 890 – Engineering Project

Industrial project work culminating in writing engineering reports. Projects cover comprehensive analytical and/or experimental treatment of phenomena of current interest in automotive engineering emphasizing modern technological problems. May be repeated for a maximum of nine credits.

AuE 891 – Doctoral Dissertation Research**AuE 893 – Selected Topics in Automotive Engineering**

Advanced concepts in multibody systems dynamics including kinematics and kinetics of multibody systems, various methods for equation formulation and their limitations, numerical solutions methods, and applications to automotive systems and subsystems.

Related Mechanical Engineering Courses

ME 416/616 Control of Mechanical Systems

ME 440 Materials for Aggressive Environments

ME 450/650 Mechanical Vibrations

ME 453/653 Dynamic Performance of Vehicles

ME 454/654 Design of Machine Elements

ME 471/671 CAE Analysis and Design

ME 821 Advanced Control Engineering

ME 843 Nonlinear Dynamics of Mechanical Systems

ME 846 Intermediate Dynamics

ME 872 Design Automation

ME 893 "MicroFabrication

Appendix 3

College of Engineering and Science, Centers, Alliances and Affiliated Institutes

Bioengineering Alliance of South Carolina

Dr. Richard Swaja, Director
BSB 612, Medical Univ. of South Carolina, 171 Ashley Ave., Charleston, SC 29425
(Voice) 843-792-0430; swajar@musc.edu

National Brick Research Center

Dr. Denis Brosnan, Director
The Bishop Center, Clemson Research Park
(Voice) 656-0603; bdenis@clemson.edu

Center for Advanced Engineering Fibers and Films (CAEFF)

Dr. Amod A. Ogale, Director
203 Earle Hall
(Voice) 656-5483; ogale@clemson.edu

Construction Industry Cooperative Alliance (CICA)

Dr. Steve Sanders, Director
114 Lowry Hall
(Voice) 656-3661; steves@clemson.edu

Center for Research in Wireless Communication

Dr. Wilson Pearson
301 Fluor Daniel Building
(Voice) 656-3946; PL@clemson.edu

Center for Optical Materials Science and Engineering Technologies (COMSET)

Dr. John Ballato, Director
AMRL, 91 Technology Dr., Clemson Res. Park
(Voice) 656-1035; jballat@clemson.edu

CU Electrical Power Research Association (CUEPRA)

Dr. Adly A. Girgis, Director
303 Riggs Hall
(Voice) 656-5936; adly.girgis@ces.clemson.edu

Center of Excellence in Mathematics & Science Education (CEMSE)

Dr. Calvin Williams
Mathematical Sciences, O323 Martin Hall
(Voice) 656-5241; CALVINW@CLEMSON.EDU

Center for Advanced Materials for Thermoelectric Energy Conversion (CAMTEC)

Dr. Terry Tritt, Director
103 Kinard Lab
(Voice) 656-5319; ttritt@clemson.edu

Conservation Center

Dr. Michael J. Drews, Director
268 Surrine Hall
(Voice) 656-5955; DMICHAE@CLEMSON.EDU

Laboratory for Emerging Materials

Dr. Ya-Ping Sun, Director
469 Hunter
(Voice) 656-5026; syaping@clemsom.edu

Nuclear Environmental Sciences and Radiation Waste Management (NESRWM)

Robert Fjeld, Director
166 Rich Lab/Research Park
(Voice) 656-5569; FJELD@CLEMSON.EDU

SC COBRE Center of Biomaterials for Tissue Regeneration (SCBioMat)

Dr. Naren Vyavahare, Director
501 Rhodes Research Center
(Voice) 864-656-5558; narenv@clemsom.edu

Affiliated Institutes

Campbell Graduate Engineering Center (CGEC)

Dr. Imtiaz Haque, Executive Director
Campbell Graduate Engineering Center @ CU-ICAR
4 Research Dr., Greenville, SC 29607
(Voice) 864-283-7212; sih@clemsom.edu

Automotive Safety Research Institute (CU-ASRI)

Kim E. Alexander
D141 Poole AG Center
(Voice) 656-0664; KALXNDR@CLEMSON.EDU

Institute of Biological Interfaces of Engineering

Dr. Karen J. L. Burg, Director
401 Rhodes
(Voice) 656-6462; KBURG@CLEMSON.EDU

South Carolina's Coalition for Mathematics and Science

Dr. Tom Peters, Director
Sears House #3, Highway 93
(Voice) 656-1863; tpeters@ssi.edc.org

Clemson Engineering Technology Lab (CETL)

Donald L. Erich
100 Technology Dr., Research Park, Pendleton, SC
(Voice) 646-2413; derich@clemsom.edu

Clemson University International Center for Automotive Research

Robert T. Geolas
CU-ICAR, 10 Falcon Crest Dr., Greenville, SC 29603
(Voice) (864) 298-2292; GEOLAS@CLEMSON.EDU

Clemson Apparel Research (CAR)

Dr. Christine W. Cole, Director
500 Lebanon Road, Pendleton, SC 29670
(Voice) 646-8454; cwjrv@clemson.edu

SC Institute for Energy Studies (SCIES)

Dr. Robert Leitner, Director
200 Dillard Building, 400 Klugh Ave., Clemson, SC 29634
(Voice) 656-2267; RLEITNE@CLEMSON.EDU

Supply Chain Optimization and Logistics (CISCOL)

Dr. William G. Ferrell, Jr.
200 Freeman Hall
(Voice) 656-2724; FWILLIA@CLEMSON.EDU

Institute for Modeling and Simulation Applications

Dr. Steve (Dennis E.) Stevenson, Director
442 Edwards Hall
(Voice) 656-5880; STEVE@clemson.edu

Clemson Environmental Institute (CIES)

Dr. Alan Elzerman
Rich Lab, Clemson Research Park
(Voice) 656-5568; AWLZRMN@CLEMSON.EDU

Clemson Institute for Biomedical Science and Engineering

Dr. Martine LaBerge
301 Rhodes
(Voice) 656-5557; LABERGE @CLEMSON.EDU

Center for Motorsports Excellence

Dr. Thomas Kurfess, Director
4 Research Dr., Greenville, SC 29617
(Voice) (864)283-7219; kurfess@clemson.edu

Clemson University Computational Center for Mobility Systems

Dr. James Leylek, Executive Director
74 Research Dr., CU-ICAR Campus, Greenville, SC 29607
(Voice) (864) 283-7300; jleylek@clemson.edu

Automotive Engineering Research Interests

Dept. Research Interests		Courses Taught	
Beshah Ayalew	AuE	Modeling and Control of Dynamic Systems, Robust and Nonlinear Control, Vehicle Powertrain and Stability Control, Fluid Power Systems, Hydraulic & Electric Hybrid Powertrains, Robotics, Testing Systems	
Johnell Brooks (Affiliated)	Psych	transportation issues associated with both drivers and pedestrians to increase the understanding of human behavior and awareness concerning the risks and realities associated with these diverse aspects of transportation so that roadway environments can become safer.	
Georges Fadel (affiliated)	ME	form-function design, affordance relationships, complex design problems, multi-material (heterogenous) design and manufacturing, multi-objective optimization and evaluation of Pareto space, multi-disciplinary optimization, robust design, decision analysis, simulation-based distributed collaborative systems design; CAD issues related to rapid and agile manufacturing; virtual reality systems; developing algorithms to improve speed and accuracy;	
Mica Grujicic (affiliated)	ME	materials processing, development, and characterization; computational analysis and simulations	manufacturing processes; materials selection in design; FEA thermodynamics of materials; kinetics of material processing
Imtiaz Haque (Dept. Chair, and exec. director of CU-ICAR)	AuE	dynamics and vibrations; modeling/simulation of vehicle dynamics multi-body systems; mechanisms and machines; manufacturing processes	dynamics; vibrations; vehicle dynamics
Todd Hubing	AuE	electromagnetic compatibility and computation electromagnetic modeling, particularly as it is applied to automotive and aerospace designs.	
Steve Hung	AuE	energy efficiency-enhancing technologies; mechatronics	system integration methods; control systems
Tom Kurfess (BMW Endowed Chair of Manufacturing Integration and Director of CGEC)	AuE	Manufacturing Systems, Automotive Systems, System Dynamics and Controls; Mechatronics; Robotics; Precision production systems; design and development of advanced manufacturing systems targeting automotive section (OEM and supplier) production systems	manufacturing; mechatronics; automotive systems; real-time control and signal processing
Lin Ma (affiliated)	ME	Laser diagnostics; Application of advanced optical sensors in practical devices; Laser sensors for multiphase flows	Thermodynamics, heat transfer, fluid dynamics
Laine Mears	AuE	Data Analysis and Distributed Control; Friction Modeling and Control; Manufacturing Reconfigurability and Agility	manufacturing processes; manufacturing modeling; data acquisition and control
Gregory Mocko (affiliated)	ME	CAD/CAM/CAE; Simulation-Based Engineering Design Information and Knowledge Management; Multi-disciplinary Design Decision-Making; Precision machine design and the design of instruments and systems for high precision dimensional metrology and manufacturing.	Design Theory and Methodology; Computer Aided Design and Analysis; Engineering Information Mgmt
Mohammed Omar	AuE	automotive production lines; optimization; non-destructive testing systems for automotive plant products and processes; automotive painting booths operation; automotive quality assurance.	engineering optics; machine vision; image processing; automotive engineering and production

Automotive Engineering Research Interests

Pierluigi Pisu	AuE	Control and diagnostics of hybrid-electric and fuel cell vehicles; fault diagnosis with application to vehicle systems; fault tolerant control; s-by-wire systems; vehicle system optimization; energy management control of hybrid electric vehicles, sliding mode control, and robust control.	Diagnostics; hybrid-electric vehicles; control theory; vehicle dynamics
Robert Prucka	AuE	development of novel experimental and modeling techniques to improve internal combustion engine control, performance, emissions and efficiency.	
Joshua Summers (affiliated)	ME	Knowledge Management for Engineering; Design Space Exploration; CAD/CAM; Collaborative Design review; virtual reality	Design Theory and Methodology; computer-aided design and manufacturing; collaborative design
Joachim Taiber	ECE	coordinating all research activities in Clean Transportation and Advanced Vehicle Communication across the different engineering departments	
Lonny Thompson (affiliated)	ME	Noise control and acoustics; structural acoustics; hybrid composite systems; crash simulation	finite element analysis; computational mechanics; numerical methods
Ardalan Vahidi (affiliated)	ME	Fuel cell power systems; Hybrid electric Vehicles; supercapacitors; vehicle active safety systems; real-time parameter estimation; hierarchical control structures; computational control	Dynamic systems and controls
Paul Venhovens	AuE	Functional Integration; vehicle platforms; vehicle dynamics; noise vibration and harshness; crashworthiness; vehicle performance; driver assistance systems; multi-body simulations	
John Wagner (affiliated)	ME	Mechatronic system design; nonlinear and intelligent controls; diagnostic and prognostic strategies; dynamic system modeling with applications to automotive, manufacturing, and turbine systems.	Mechatronic systems; control theory; analysis of dynamic systems
John Ziegert	AuE	precision machine design; precision dimensional manufacturing and metrology; robotics	design; solid mechanics; manufacturing

Title	Holdings	Faculty Publish
Accident Analysis and Prevention	1995-date, Science Direct	3
ADVANCED MATERIALS & PROCESSES	1994-date, several	1
AI Edam-Artificial Intelligence for Engineering Design Analysis and Manufacturing	No Holdings	1
Applied Computational Electromagnetics Society Journal	No Holdings	2
APPLIED OPTICS	1962-date, OpticsInfoBase	4
APPLIED PHYSICS LETTERS	1962-date, several	2
Applied Spectroscopy	1946-date, OpticsInfoBase2005	4
APPLIED SURFACE SCIENCE	1985-date	21
Automotive Engineer	1997-date, EBSCO (older print volumes in storage)	
Automotive Engineering International	v.106 (1998)-date (print)	
CHEMICAL ENGINEERING SCIENCE	1995-date, Science Direct	1
CIRP ANNALS-MANUFACTURING TECHNOLOGY	v.24(1975)-date print/CD-ROM	1
Clinical Otolaryngology	2005-date, Academic Search Premier	1
COMPOSITES PART B-ENGINEERING	1996-date, Science Direct	1
Computer Physics Communications	1995-date, Science Direct	3
Computer-Aided Design and Applications	1991-date, print	1
Computers in Education Journal	1991-date, print	2
Concurrent Engineering Research and Applications	2005-2008, Gale	1
CONTROL ENGINEERING	1999-date, several	6
CONTROL ENGINEERING PRACTICE	1995-date, Science Direct	2
DESIGN STUDIES	1995-date, Science Direct	2
FATIGUE & FRACTURE OF ENGINEERING MATERIALS & STRUCTURES	1997-date, Blackwell	1
Fire Technology	1997-date, Springer	1
Gerontologist	1992-2009, Proquest; 2009-1 yr ago, PubMed	7
Heavy Vehicle Systems International Journal of Vehicle Design	No Holdings	1
Human Factors	1999-date, Sage	2
IEEE CONTROL SYSTEMS MAGAZINE	1990-date, IEEE/IET	1
IEEE TRANSACTIONS ON AUTOMATIC CONTROL	1963-date, IEEE/IET	1
IEEE TRANSACTIONS ON CONTROL SYSTEMS TECHNOLOGY	1993-date, IEEE/IET	5
IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS	1982-date, IEEE/IET	4

Appendix 5

Automotive Engineering Journals *

IEEE Transactions on Intelligent Transport Systems	2000-date, IEEE/IET	
IEEE Transactions on Magnetics	1965-date, IEEE/IET	1
IEEE Transactions on Microwave Theory and Applications	1963-date, IEEE/IET	1
IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY	1967-date, IEEE/IET	8
IEEE Vehicular Technology Magazine	2006-date, IEEE/IET	1
IEEE-ASME TRANSACTIONS ON MECHATRONICS	1996-date, IEEE/IET	5
IET Control Theory and Applications	2007-date, IEEE/IET	1
IET Intelligent Transport Systems	2007-date, IEEE/IET	
INDUSTRIAL ROBOT-AN INTERNATIONAL JOURNAL	1994-date, Emerald	1
Infrared Physics and Technology	1995-date, Science Direct	3
INTERNATIONAL JOURNAL OF ADAPTIVE CONTROL AND SIGNAL PROCESSING	1996-date, Wiley	2
INTERNATIONAL JOURNAL OF AUTOMOTIVE TECHNOLOGY	No Holdings	
International Journal of Computer Applications in Technology	No Holdings	1
International Journal of Engine Research	2000-2009 Academic Search Premier	
International Journal of Engineering Education	1997-date, e-journal subscription	1
International Journal of Heavy Vehicle Systems	No Holdings	2
INTERNATIONAL JOURNAL OF IMPACT ENGINEERING	1995-date, Science Direct	1
International Journal of Industrial Ergonomics	1995-date, Science Direct	1
INTERNATIONAL JOURNAL OF MACHINE TOOLS & MANUFACTURE	1995-date, Science Direct	2
International Journal of Manufacturing Research	No Holdings	1
International Journal of Mechanical Engineering Education	1999-date, Academic Search Premier	1
International Journal of Optomechatronics	2007-date, Informaworld	1
International Journal of Product Development	No Holdings	1
INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH	1961-date, Bus. Source Premier; 1997-date Informaworld	1
INTERNATIONAL JOURNAL OF VEHICLE DESIGN	1982-date, print	10
International Journal on Interactive Design and Manufacturing	No Holdings	1
ITE Journal	1978-date, print	
JOURNAL OF ADVANCED TRANSPORTATION	2007-date, Gale	
Journal of Aerosol Science	1970-date, Science Direct	4
JOURNAL OF AEROSPACE ENGINEERING	1988-date, ASCE	
Journal of Computational and Nonlinear Dynamics	2006-date, ASME	3
JOURNAL OF COMPUTING AND INFORMATION SCIENCE IN ENGINEERING	2001-date, ASME	3

* IN PROGRESS - From JCR Reports for Transportation, plus journals from Mechanical Engineering in which faculty have published

Appendix 5

Automotive Engineering Journals *

JOURNAL OF DYNAMIC SYSTEMS MEASUREMENT AND CONTROL-TRANSACTIONS OF THE ASME	1980-date, ASME	3
Journal of Engineering Design	1997-date, Informaworld; 1994-18 mo. Ago, Ebsco	2
Journal of Energy Resources Technology	1980-date, ASME	1
Journal of Experimental Psychology	1975-date, PsychARTICLES	2
JOURNAL OF INTELLIGENT MANUFACTURING	1997-date, Springer; L/N selected	1
Journal of Intelligent Transportation Systems	1994-date, ASCE; 2004-date Informaworld	
JOURNAL OF MANUFACTURING SCIENCE AND ENGINEERING-TRANSACTIONS OF THE ASME	1980-date, ASME	6
Journal of Manufacturing Systems	1995-2008, Science Direct	2
JOURNAL OF MATERIALS ENGINEERING AND PERFORMANCE	1997-date, Springer	10
JOURNAL OF MATERIALS PROCESSING TECHNOLOGY	1990-date, Science Direct	9
JOURNAL OF MATERIALS SCIENCE	1997-date, Kluwer	31
JOURNAL OF MECHANICAL DESIGN	1990-date, ASME	6
JOURNAL OF MICROMECHANICS AND MICROENGINEERING	1991-date, IOP	3
Journal of Power Sources	1995-date, Science Direct	1
JOURNAL OF PROCESS CONTROL	1995-date, Science Direct	1
Journal of Quantitative Spectroscopy and Radiative Transfer	1995-date, Science Direct	2
JOURNAL OF SOUND AND VIBRATION	1964-date, Science Direct and IDEAL	1
JOURNAL OF THERMOPHYSICS AND HEAT TRANSFER	2003-date, AIAA	2
JOURNAL OF TRANSPORTATION ENGINEERING-ASCE	1983-date, ASCE	
Manufacturing Engineering	1980-date, Science Direct	5
MATERIALS & DESIGN	1980-date, Science Direct	10
MATERIALS CHEMISTRY AND PHYSICS	1983-date, Science Direct	1
MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES, MICROSTRUCTURE AND PROCESSING	1989-date, Science Direct	6
MATERIALS SCIENCE AND ENGINEERING B-SOLID STATE MATERIALS FOR ADVANCED TECHNOLOGY	1989-date, Science Direct	5
MECHANISM AND MACHINE THEORY	1995-date, Science Direct	2
MECHATRONICS	1996-date, IEEE/IET	3
MULTIBODY SYSTEM DYNAMICS	1997-date, Kluwer	1
NDT&E International	1995-date, Science Direct	2
NETWORKS & SPATIAL ECONOMICS	2001-date, Springer	
Omega International Journal of Management Science	No Holdings	1

* IN PROGRESS - From JCR Reports for Transportation, plus journals from Mechanical Engineering in which faculty have published

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Automotive Engineering Journals *

Optics Express	1997-date OpticsInfoBase	1
Optics Letters	1997-date OpticsInfoBase	1
Optometry and Vision Science	No Holdings	1
Perception	1998-date, Ebscohost	1
PRECISION ENGINEERING-JOURNAL OF THE INTERNATIONAL SOCIETIES FOR PRECISION	1996-date, Wiley	2
PROCEEDINGS OF THE INSTITUTION OF CIVIL ENGINEERS-TRANSPORT	1992-date, ICE	
Proceedings of the Institution of Mechanical Engineers Part A - Journal of Power and Energy	1990-date, IMechE	1
Proceedings of the Institution of Mechanical Engineers Part B - Journal of Engineering Manufactures	1984-date, IMechE	2
Proceedings of the Institution of Mechanical Engineers Part C - Mechanical engineering science	1983-date, IMechE	
PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART D-JOURNAL OF AUTOMOBILE ENGINEERING	1989-date, IMechE	5
PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART E-JOURNAL OF PROCESS MECHANICAL ENGINEERING	1989-date, IMechE	
PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART F-JOURNAL OF RAIL AND RAPID TRANSIT	1989-date, IMechE	
PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART G-JOURNAL OF AEROSPACE ENGINEERING	1989-date, IMechE	
PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART I-JOURNAL OF SYSTEMS AND CONTROL ENGINEERING	1991-date, IMechE	1
PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART J-JOURNAL OF ENGINEERING TRIBOLOGY	1994-date, IMechE	
PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART K-JOURNAL OF MULTI-BODY DYNAMICS	1999-date, IMechE	1
Proceedings of the Institution of Mechanical Engineers Part L-Journal of Materials: Design and Applications	1999-date, IMechE	7
Proceedings of the SPIE	monograph holdings	1
Progress in Organic Coatings	1972-date, Science Direct	1
Radiotherapy and Oncology	1995-date, Science Direct	1
RAPID PROTOTYPING JOURNAL	1994-date, Emerald	2
RESEARCH IN ENGINEERING DESIGN	1997-date, Springer	4

* IN PROGRESS - From JCR Reports for Transportation, plus journals from Mechanical Engineering in which faculty have published

Appendix 5

Automotive Engineering Journals *

Research Letters in Materials Science	No Holdings	1
Sensor Review	1981-date, Emerald Engineering	2
SHOCK AND VIBRATION	1993-date, Acad. Search Premier	2
SOIL DYNAMICS AND EARTHQUAKE ENGINEERING	1995-date, Science Direct	4
Stapp Car Crash Journal	2002, 2004, 2007, 2009	
STRUCTURAL AND MULTIDISCIPLINARY OPTIMIZATION	1997-date, Springer	1
Textures of Materials	No Holdings	1
Transport Reviews	1997-date informaworld, 1999-1 year ago Ebsco	
TRANSPORTATION	1997-date, Springer	
TRANSPORTATION PLANNING AND TECHNOLOGY	2007-date, Informaworld; 2002-1 year ago Ebsco	
Transportation Research Part A	2007-date, IEEE/IET	
Transportation Research Part B	1995-date, Science Direct	
Transportation Research Part C	1995-date, Science Direct	
Transportation Research Part D	1995-date, Science Direct	
Transportation Research Part E	1995-date, Science Direct	
Transportation Research Part F	1995-date, Science Direct	
Transportation Research Record	no.480 (1974)-date	2
Transportation Research Record	no.480 (1974)-date	
TRANSPORTATION SCIENCE	1967-date, many aggregators	
TRANSPORTMETRICA	No Holdings	
VEHICLE SYSTEM DYNAMICS	1997-date, Informaworld	3
Virtual and Physical Prototyping	2006-date, Informaworld	1
Ward's Auto World	1983-date, many aggregators	
Ward's Dealer Business	1995-date, many aggregators	
WEAR	1957-date, Science Direct	3
Weekly of Business Aviation	1989-date, LexisNexis	

* IN PROGRESS - From JCR Reports for Transportation, plus journals from Mechanical Engineering in which faculty have published

Appendix 6

“Core” Journal Packages -Engineering

General

Elsevier (Science Direct)

Springer

Wiley-Blackwell

Professional Societies

ACM Digital Library

ASCE Digital Library

ASME Digital Library

IEEE / IET – IEEE Xplore

SAE Digital Library

SPIE Digital Library

Professional Societies (Great Britain)

ICE – Institution of Civil Engineers

IMechE – Institution of Mechanical Engineers

“Core” Databases

General

Engineering Village (Compendex, Historical Engineering Index, and Inspec)

Web of Knowledge (Science Citation Index, Inspec)

Scifinder Scholar (Chemical Abstracts)

Medline (from EBSCO) plus PubMed (free, from the National Library of Medicine)

Refworks (Bibliographic Citation Management package)