



Graduate Student Manual

Department of Automotive Engineering (MS, PhD) Programs

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INTRODUCTION

This manual has been prepared to inform the Automotive Engineering (MS, PhD) graduate students, in the Department of Automotive Engineering of the department regulations and procedures governing the granting of graduate degrees. Graduate students should become familiar with the information presented here, as well as with general Graduate School requirements outlined in the Graduate School Announcements (www.grad.clemson.edu). If the answer to a question cannot be obtained from this manual or the GS Announcements, the answer should be sought by asking: the automotive engineering program, Graduate Student Services Coordinator, your major advisor, or the Graduate School, preferably in that order.

Students must read this manual and return FORM 15 signed (see last page) to the program Graduate Student Services Coordinator.

DEPARTMENTAL POLICY ON ETHICS

The effectiveness of the research infrastructure throughout the world is based on the personal and professional integrity of the people involved. The basic assumption that is central to all research endeavors is that **researchers have done what they say they have done**. The Department of Automotive Engineering is part of that infrastructure and the research conducted here must withstand the highest scrutiny. Consequently, we must all ensure that our scholarly work is conducted and reported with the highest ethical standards. We must be careful in our record keeping and diligent in our efforts to attribute credit when we utilize the work done previously by others. In particular, we must guard against any activity that calls into question our integrity. In this regard, we affirm the following:

- information in a research program will be truthfully presented,
- the work of others will never be misrepresented as our own,
- information will be obtained only if access is authorized.

THE HONOR CODE

This Honor Code was initiated by engineering students in the College of Engineering and Science with the advice and approval from the faculty. The document reflects a mutual trust between the students and faculty at Clemson University. By living under the guidance of the Code, we are contributing to our personal success as well as the success of all engineers associated with the College of Engineering and Science.

As members of the College of Engineering and Science, we recognize that lasting excellence is achieved only through honor, demanding standards for personal integrity that reflect the standards of conduct expected of all engineers. All undergraduate and graduate engineering students, faculty members, and administrators in the College of Engineering and Science are expected to abide by the ethical standards defined herein. These standards are based on the following principles:

Engineers, both students and professionals, must be of honorable and trustworthy character. It is dishonest to claim credit for work, which is not the result of one's own efforts.

Students, faculty members, and administrators are bound by a mutual trust to uphold the principles and enforce the policies of the Honor Code. This makes

it the duty and responsibility of all members of the College of Engineering and Science to report promptly any suspected violations of the Code.

The Honor Code establishes a standard of academic integrity. As such, this code demands a firm adherence to a set of values. This Honor Code requires that all graduate students exercise honesty and ethical behavior in all their academic pursuits, whether these undertakings pertain to study, coursework, research or teaching.

We recognized that our graduate students have very diverse cultural backgrounds. Because of this, the term ethical behavior is defined as conforming to accepted professional standards of conduct, such as codes of ethics used by professional societies in the United States. This regulates the behavior in which their professions are conducted. The knowledge and practice of ethical behavior is the full responsibility of the student. Graduate students may, however, consult with their advisor, department head, the International Student Office, or the Graduate School for further information of what is expected of them.

UNIVERSITY HARASSMENT POLICIES

RACIAL HARASSMENT POLICY

It is the policy of Clemson University to conduct and provide programs, activities and services to students, faculty and staff in an atmosphere free from racial harassment. Racial harassment is any behavior that would verbally or physically threaten, torment, badger, heckle or persecute an individual because of his or her race.

Racial harassment of University faculty, staff, students or visitors is prohibited and shall subject the offender to appropriate disciplinary action.

Students who feel that they have been subjected to racial harassment can seek advice from the Office of Access & Equity, E-103 Martin Hall, phone: 656-3181.

SEXUAL HARASSMENT POLICY

Title VII of the Civil Rights Act of 1964, as amended, provides that it shall be unlawful discriminatory practice for any employer, because of the sex of any person, to discharge without just cause, to refuse to hire, or otherwise discriminate against any person with respect to any matter directly or indirectly related to employment. Harassment of any employee on the basis of sex violates this federal law. The Equal Employment Opportunity Commission has issued guidelines as to what constitutes sexual harassment of an employee under Title VII.

Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when the following occurs:

1. submission to such conduct is made explicitly or implicitly a term or condition of an individual's employment or academic standing; or
2. submission to or rejection of such conduct by an individual is used as a basis for employment or for arriving at academic decisions affecting an individual; or

3. such conduct unreasonably interferes with an individual's work or academic performance, or creates an intimidating, hostile, or offensive working or academic environment.

Sexual harassment of University faculty, staff or students is prohibited and shall subject the offender to dismissal or other sanctions after compliance with procedural due process requirements. In the event a claim of sexual harassment arises, the claimant may use University grievance procedures that have been established for faculty, staff and students as appropriate. This policy also prohibits an employee from sexually harassing a superior and a student from sexually harassing a faculty member. Employees or students who feel they are victims of this form of discrimination are encouraged to consult the Office Equity & Access, E-103 Martin Hall, (864) 656-3181, for advice and assistance in resolving complaints.

In the event a graduate student wishes to appeal the resolution of the Office of Access and Equity, the student must submit a written request for an appeal to the dean of the Graduate School, who in turn will convene an ad hoc committee that will review the process and/or sanction. The committee membership will come from faculty and students already appointed to the Graduate Council.

AMOROUS RELATIONSHIPS

Amorous relationships that might be appropriate in other circumstances can be inappropriate when they occur between a faculty member, officer or supervisor of the University, and any student or subordinate employee for whom he/she has a professional responsibility.

Those in positions of authority inherently carry the element of power in their relationships with students or subordinates. It is imperative that those with authority neither abuse, nor appear to abuse, this power entrusted to them.

Officers, supervisors and members of the teaching staff should be aware that any romantic involvement with a student or subordinate employee could make them liable for formal action if a complaint is initiated. Even when both parties have consented to such a relationship, it is the officer, supervisor or faculty member who may be held accountable for unprofessional behavior. Difficulties can also arise from third parties who may feel that they have been disadvantaged by such relationships. Graduate assistants, resident assistants, tutors and undergraduate teaching assistants who are also professionally responsible for students, would be wise to exercise special care in their relationships with students they instruct or evaluate.

Any questions concerning these statements or Clemson University's Policy on Sexual Harassment should be directed to the Office Access & Equity, E-103 Martin Hall, 656-3181.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT

A university is a community of scholars dedicated to the free inquiry of knowledge and truth. It follows as a basic tenet that scholars will conduct themselves with integrity in academic pursuits. In instances where the academic standards may have been compromised, Clemson University has a responsibility to protect this process and to respond appropriately and expeditiously to charges of academic misconduct. Academic misconduct includes, but is not

limited to, submission of fraudulent admission credentials, academic dishonesty, falsification of data in research and plagiarism in theses, dissertations or other final projects.

I. General

- A. Academic dishonesty includes giving, receiving or using unauthorized aid on any academic work.
- B. Plagiarism, a form of academic dishonesty, includes the copying of language, structure or ideas of another and attributing the work to one's own efforts.
- C. All academic work submitted for grading contains an implicit pledge and may contain, at the request of the instructor, an explicit pledge by the student that no unauthorized aid has been received.
- D. Academic dishonesty includes attempts to copy, edit or delete computer files that belong to another person or use Computer Center account numbers that belong to another person without the permission of the file owner, account number owner or file number.

II. Penalties

- A. A student guilty of the first offense of academic dishonesty typically will receive a grade of F for the course. In flagrant cases, the student may also be suspended for one or more semesters or may be permanently dismissed.
- B. A student guilty of the second offense of academic dishonesty will receive a grade of F for the course, will be suspended for one or more semesters and may be permanently dismissed. Suspension and dismissal require approval of the President of the University.

III. Procedures

Academic honesty is the individual responsibility of each student. Students should report violations of this policy either to the instructor of the affected course or to any member of the administration. When, in the opinion of an instructor, a student has committed an act of academic dishonesty, the following procedure must be followed:

1. The instructor will inform the student in private of the nature of the alleged charge of academic dishonesty and will simultaneously request in writing that the department chair verify from the registrar if the incident is a first offense.
2. When this information has been received, the instructor will notify the student in writing of the charge of academic dishonesty and the penalty recommended by the instructor and approved by the chair of the department in which the course is taught. The notification will further state that if the student regards the charge as unfair, the student has seven days from the date of receipt of notice to file a grievance with the Graduate Student Grievance Committee.
3. If no grievance is filed by the student, the instructor will forward copies of the written notification to the dean of the college and to the registrar.
4. Should the act of dishonesty not be in the college of the student's major, the registrar will notify the major department chair.

A charge of academic dishonesty in a course must be made within 45 calendar days of the date printed on the grade report for the semester or session in which the course is completed. For grades that replace an original grade of I (incomplete), the 45 days begin the day the I is converted to the final grade.

AUTOMOTIVE ENGINEERING MS PROGRAM

The automotive engineering MS program requires students to complete graduate coursework equivalent to 36 credit hours and a 6 month internship (6 credit hours). This internship can be completed at an automotive original equipment manufacturer, or supplier manufacturing facility, or technical center, or by enrolling in the Deep Orange project at the Carroll A. Campbell Jr. Graduate Engineering Center. In addition, students are expected to demonstrate competency in a foreign language. The course requirements are based on two main focus areas:

1. **System Stem:** MS students develop skills and understandings in/of the tools, procedures, and the processes used by the automotive Original Equipment Manufacturer (OEMs), in conceiving, designing, developing, launching and producing vehicles; with a system level understanding of the automotive process chain.

Students selecting the system-stem should enroll in two courses, from the following table

Table 1: List of Available System Stem Courses

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

2. **Functional Stem:** MS students develop skills and understanding in/of specific vehicle's sub-system, or technology; with understanding of the design and development of vehicles' systems.

Technical Track Courses 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 different tracks.

MS Student Advisor:

Each MS student will be appointed an advisor upon his/her admission into the automotive engineering program. The student should consult with his/her advisor through their study period. The advisor will approve the student selection of courses by signing the GS-2 form.

MS Students' System Integration Project:

The AuE MS students, who choose to do their internship through enrollment in the Deep Orange Project, are expected to follow the following sequence of courses:

AuE 890 (Deep Orange section) during first summer I and summer II semesters,

AuE 883 Second Fall Semester following Summer I and II.

AuE 890: Second Spring Semester.

Students will be evaluated based on guidelines issued by the instructors of each course.

AUTOMOTIVE ENGINEERING PHD PROGRAM

The automotive engineering PhD program aims at developing students with skills and research competence in current and future automotive research disciplines, students should be able to address multidisciplinary problems in the context of automotive industry needs. Graduates must understand the new technological challenges and the global automotive market place and issues.

PhD Qualifying Examination and GPA Requirement

Entering AuE students in the PhD program must maintain a cumulative GPA of at least 3.5 and pass a qualifying exam to continue in the program past the first year. Students who fail to maintain a cumulative GPA of at least 3.5 will not be allowed to take the qualifying exam and will be dismissed from the PhD program.

If a student fails the AuE PhD Qualifying Examination, that student will be permitted to continue as an AuE Masters student but will be ineligible to re-apply to the AuE PhD program.

1. The AuE PhD qualifying examination for new students is held once a year at the end of the Spring Semester (exact date to be decided each year). Re-examination for students with marginal scores is held before the following Fall semester (exact date to be decided each year). The examination consists of the following steps: The student must identify and research a topic of their choosing in their field of interest. The topic of choice must be of a technical nature related to the field of automotive/transportation engineering and may be related to the student's current area of PhD research.
2. The student must present the results of his/her research to the faculty of the Department of Automotive Engineering in the form of an oral presentation not to exceed 30 minutes in length followed by an oral exam on the research topic chosen, including core engineering disciplines applied. No written report will be required.

The purpose of the research presentation is to demonstrate the student's ability and potential to identify and conduct research, and to effectively communicate and defend their work. It is expected that each student will clearly identify the research question(s) to be addressed, present a comprehensive review of the appropriate literature and prior art, propose a plan to address the research questions, and justify the viability of that plan.

The faculty of Automotive Engineering conducts an oral examination of the student on the basis of presented research and associated technical topics. A grade of "Pass", "Marginal", or "Fail" is assigned at the end of the examination.

Only students achieving the grade of “Pass” are allowed to continue in the AuE PhD program. Students with the “Marginal” score are required to re-present in a second qualifying exam session; in which a grade of “Pass” or “Fail” will be assigned by the faculty based on the second presentation. Failure to attain a “Pass” in this second attempt results in dismissal from the program.

Comprehensive Examination

Each PhD student is required to pass a PhD Comprehensive Examination; the comprehensive exam rules and regulations are available through the Graduate School Announcements (www.grad.clemson.edu). In the Department of Automotive Engineering the comprehensive examination may only be taken after an advisory committee has been selected, a graduate degree curriculum has been approved using Form GS-2, and the Qualifying Examinations have been successfully completed.

Dissertation

The automotive engineering PhD Dissertation must be cross-disciplinary in nature and pertain to automotive research. Student must have approval of the topic and scope of their dissertation by their advisory committee.

Dissertation Defense/Final Oral Examination

Information relating to final oral examination scheduling and requirements is available through the Graduate School Announcements (www.grad.clemson.edu). Additional information can be obtained from the Graduate Student Services Coordinator.

PROCEDURES FOR STUDENTS SEEKING GRADUATE DEGREES (MS, PhD in Automotive Engineering)

GENERAL

TYPICAL MINIMUM DEGREE REQUIREMENTS

The typical requirements for M.S. and Ph.D. in automotive engineering programs are outlined in Table 2.

ACADEMIC REQUIREMENTS

Academic regulations pertaining to the various degree programs are published in the Graduate School Announcements (www.grad.clemson.edu). Specific questions concerning academic requirements should be directed to the Graduate Program Coordinator or the program Graduate Student Services Coordinator.

CORE COURSE REQUIREMENTS

The automotive MS student must take the 5 core courses listed in Table 3, in addition to AuE 883 if enrolled in the Deep Orange project, while the PhD students must take the 3 core courses listed in table 4. Core course requirements must be met. Core courses will be listed on your Plan of Study (GS2).

Any changes to course requirements, such as waivers or substitutions, must be approved by the Department Chair. Requests should be made in a timely manner and should be pre-approved by the Department Chair. Courses taken prior to the request are subject to rejection by the Chair.

DEPARTMENTAL EXPECTATIONS FOR GRADUATE WORK FORM

The purpose of this “release form” is to help avoid misunderstandings between advisor and graduate student concerning expectations for degree completion. Part I of the form should be completed, signed by the advisor and student, and filed with the GS2 form. The advisor must sign Part II before a student can receive a graduate degree in the Department of Automotive Engineering.

The goal should be to complete most of these topics in a continuous manner, while the research is being conducted, rather than waiting until the end. One important point is that computer programs written, data generated, discoveries made, derivations developed, etc., by a Clemson graduate student are the property of Clemson University, not of the student.

Publications and other methods for disseminating research results are expected activities of graduate students. Doctoral students, and in most cases, MS students in the Department are expected to publish one or more archival journal papers. In many ways, the quality of an MS or Ph.D. program is measured by the publications. This release form puts this and related topics into the proper perspective.

This form is located in the back of this manual. (Form 14)

MINIMUM DEGREE COURSE REQUIREMENTS (MS, PhD in Automotive Engineering)

Table 2: Minimum AuE MS, PhD degrees requirements

Program	MS	PhD
Total Hours / Courses	42 hours / 12 courses	Minimum of 27 course-work hours beyond an MS
Core Courses Required	15 hours / 5 courses from table 3	9 hours / 3 courses from table 4
Technical Courses from Five Track Areas (see Table 5)	15 hours / 5 courses <i>For MS students selecting Functional-stem</i> 12 hours / 4 courses <i>3 courses must be AuE from at least two different tracks</i>	6 hours / 2 courses must be AuE in two different tracks
Minor Courses Required	6 hours / 2 courses from Table 6	3 hours / 1 course from Table 6 and 9 hours / 3 courses from one track area from Table 5
Language Competency & 6 months Internship	Language: 0 hours / 0 courses 6 month internship 6 hours/1 course (AuE 890)	Language: 0 hours / 0 courses 6 month internship (per PhD committee recommendation)
Applied Integration Project	<i>Only if enrolled in Deep Orange Conducted through AuE883</i>	
Dissertation		18 hours
Additional Requirements	<ul style="list-style-type: none"> ▪ Language Competency Exam ▪ Attendance of Cultural Seminars/Workshops 	<ul style="list-style-type: none"> ▪ Qualifying Exam ▪ Comprehensive Exam ▪ Dissertation Defense ▪ Language Competency Exam ▪ Attendance of Cultural seminars

1.1. AuE MS Core Course Requirements

The Department of Automotive Engineering requires that all Automotive MS graduate students take following six core courses:

Table 3: Automotive MS Core Courses:

Course	Topic Coverage
<p>AuE 880 Automotive Design and Project Management</p>	<p>Management, leadership, socio-cultural and technical skills training for the successful management of an automotive 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.</p>
<p>AuE 881 Automotive Systems Overview</p>	<p>Understanding of the vehicle as a complex system 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.</p>
<p>AuE 882 Systems Integration Concepts and Methods</p>	<p>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, Taguchi methods for quality.</p>
<p>(Only if enrolled in Deep Orange) AuE 883 Applied Systems Integration</p>	<p>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, risk analysis, value analysis.</p>
<p>AuE 833 Automotive Manufacturing Systems Overview</p>	<p>This course presents an overview of vehicle manufacturing from an OEM perspective. Issues such as supplier integration, flexible manufacturing, and quality engineering methods and their applications to manufacturing are presented. Emphasis is placed on opportunities and challenges presented with automotive manufacturing in a global environment, integrated processes, product development, flexible</p>

	and agile manufacturing, supplier integration.
AuE 835 Automotive Electronics Overview	This course presents an overview of vehicle electronics and IT and their impact on vehicle performance. The impact of the advent of electronics and computing on mechatronic systems integration, and vehicle reliability and warranty is discussed. Also discussed is testing and diagnostics, software standards for design and logistics, and man/machine interface.

1.2. AuE PhD Core Course Requirements

The Department of Automotive Engineering requires that all Automotive PhD graduate students take following three core courses:

Table 4: Automotive PhD Core Courses:

Course	Topic Coverage
AuE 880 Automotive Design and Project Management	Management, leadership, socio-cultural and technical skills training for the successful management of an automotive 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 Overview	Understanding of the vehicle as a complex system 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.
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, Taguchi methods for quality.

1.3. Requirements of Technical Courses from Five Track Areas

Each AuE MS student is required to take and pass with a grade of B or better five courses from at least two, and no more than three of the five track areas listed in Table 5.

Each PhD student is required to take and pass with a grade of B or better two AuE courses from two different track areas.

Each PhD student is required to take and pass with a grade of B or better three courses from one of the five track areas to count as their technical minor.

Table 5. In-depth Track Areas and Courses

Track Areas	Technical Courses
<p>Vehicle Materials & Mechanics</p>	<p>AuE849 Automotive Chassis and Body Systems Design, (3,0) AuE853 Crash Analysis Methods and Crashworthiness (3,0) AuE855 Structural/Thermal Analysis Methods for Automotive Structure, Systems, and Components, (3,0) AuE866 Advanced Materials for Automotive Applications, (3,0) AuE877 Light-Weight Vehicle Systems Design, (3,0) AuE 893 Selected Topics In Automotive Engineering, (3,0)</p> <p><u>Courses Counted from Other Majors:</u> ME 630 Mechanics of Composite Materials ME 632 Advanced Strength of Materials ME 654 Design of Machine Elements ME 655 Design for Computer Aided Manufacturing ME 671 Computer Aided Engineering Analysis ME 836 Fracture Mechanics ME 861 Material Selection in Engineering Design ME 870 Advanced Design Methodologies ME 871 Engineering Optimization MS&E 811 Materials Science and Engineering I MS&E 812 Materials Science and Engineering II CHE 819 Viscoelastic Properties of Polymers & Polymeric Composites CME 616 Electrical Properties of Materials CME 624 Optical Materials and Their Applications CME 660 Metals and Their Composites CME 809 High Temperature Materials MthSc 819 Multi-criteria Optimization MthSc 660 Introduction to Numerical Analysis MthSc 861 Advanced Numerical Analysis</p>

<p align="center">Vehicle/Components Manufacturing</p>	<p>AuE867 Vehicle Manufacturing Processes I, (3,0) AuE868 Vehicle Manufacturing Processes II, (3,0) AuE 893* Selected Topics In Automotive Engineering, (3,0)</p> <p><u>Courses Counted from Other Majors:</u> ME 656 Fundamentals of Robotics ME 822 Control of Automated Machines ME/ECE 854 Analysis of Robotic Systems IE 656 Supply Chain Design IE 661 Quality Engineering IE 665 Facility Planning and Design IE 689 Industrial Ergonomics and Automation IE 871 Industrial Testing and Quality IE 884 Advanced Engineering Economic Analysis CHE 818 Polymer Processing</p>
<p align="center">Vehicle Design and Development</p>	<p>AuE 875 Vehicle Development Process Tools, (3,0) AuE 876 Mass Customization Design for Vehicles, (3,0) AuE 877 Light-Weight Vehicle Systems Design, (3,0) AuE 884 Body and Interior Design, (3,0) AuE 885 Vehicle Layout Engineering and Ergonomic Design, (2,3) AuE 893* Selected Topics In Automotive Engineering, (3,0)</p> <p><u>Courses Counted from Other Majors:</u> ME 671 Computer Aided Engineering Analysis, (3,0) ME 654 Design of Machine Elements, (3,0) ME 655 Design for Computer Aided Manufacturing, (3,0) ME 870 Advanced Design Methodologies, (3,0) ME 871 Engineering Optimization, (3,0)</p>
<p align="center">Vehicle Power Systems & Transmissions</p>	<p>AuE816 Combustion and Emissions, (2,3) AuE817 Alternative Energy Sources, (3,0) AuE828: Fundamentals of Vehicle Drivelines, Powertrain Integration AuE 893* Selected Topics In Automotive Engineering, (3,0)</p> <p><u>Courses Counted from Other Majors:</u> ME 607 Applied Heat Transfer ME 620 Energy Sources and Their Utilization ME 629 Thermal Environmental Control</p>
<p align="center">Vehicle Performance</p>	<p>AuE805: Ground Vehicle Aerodynamics, (3,0) AuE829: Tire Behavior and its influence on Vehicle Performance, (3,0) AuE847 Vehicle Suspension Systems Design and Analysis, 3cr. (3,0) AuE848: Vehicle Braking Systems, (3,0) AuE850 - Automotive Stability and Safety Systems, (3,0) AuE886 Vehicle Noise, Vibration and Harshness, (3,0) AuE887 Methods for Vehicle Testing, (2,3) AuE 893* Selected Topics In Automotive Engineering, (3,0)</p> <p><u>Courses Counted from Other Majors:</u> ME 616 Control of Mechanical Systems ME 623 Aerodynamics</p>

	EM 650 Mechanical Vibrations ME 653 Vehicle Dynamic Performance ME 820 Modern Control Engineering
Vehicle Electrical and Electronic Systems	AuEC4: Vehicle Electronics and IT: An overview**, (3,0) AuE825: Automotive Sensors and Actuators, (3,0) AuE826 On Board Diagnostics and Reliability, (3,0) AuE 893* Selected Topics In Automotive Engineering, (3,0) <u>Courses Counted from Other Majors:</u> ME 617 Mechatronics System Design ECE 604 Semiconductor Devices ECE 617 Elements of Software Engineering ECE 631 Digital Electronics ECE 636 Microwave Circuits ECE 642 Knowledge Engineering ECE 659 Integrated Circuit Design ECE 856 Pattern Recognition

* *Dependant on the topical coverage, and approval of the advisor*

** *System-stem courses are indicated as AuE-C*

1.4. Minor Course Requirements

Each AuE MS student is required to take and pass with a grade of B or better two courses from the minor areas in Table 6.

Each AuE PhD student is required to take and pass three courses from one of the five track areas from Table 5 and one course from a business or related field from Table 6.

Table 6. Minor Areas

Minor Area	Course Requirements for Minor
Management	Any 800-level MGT courses except MGT 891 and MGT 892
Business, Finance and Law	Any 800-level MBA courses or a combination of three courses between 800-level MBA courses and FIN 602, FIN 807 FIN 867, and/or LAW 620
Executive Leadership and Entrepreneurship	ELE 600 Technology Entrepreneurship ELE 800-1 Special Topics in Technology Entrepreneurship ELE 800-2 Special Topics in Technology Entrepreneurship
Other Minors	As developed

OTHER REQUIREMENTS:

Foreign Language Competency

A required outcome of both the AuE MS and AuE PhD programs is the competency in a foreign language (Other than the student's native tongue) and a cross-cultural industrial experience.

Students coming into the MS or PhD programs without the foreign language skills will be required to take immersion course(s) in a foreign language. The immersion course(s) could be taken at the Clemson University or abroad. The immersion course(s) credit hours are not counted toward the MS and PhD degree credit hour requirements. It is the student responsibility to take the immersion courses and any other workshops to help him/her satisfy this requirement.

The student foreign language competency can be evaluated through: (a) passing an exam through a recognized educational institute specialized in the selected foreign language; also, the student competency can be evaluated through the department of languages at Clemson University. (b) Taking 3 courses in that language e.g. (101, 102, and 201) and passing with a grade of B or better, or (c) For students with international internship, their advisor can testify to their language proficiency through official communication.

International Internship:

The international internship is defined as clearly stated short-term work/learning experience to help students prepare for a chosen career field. With intentional learning goals, supervision, and evaluation, interns apply their classroom learning to "real world" experiences, enhancing their education and adding value to the employer.

- **The internship required "For academic credit":** is where the student and the internship provider will develop the specific structure of the internship before the internship begins. Then the academic department must approve the structure of the internship. The academic departments handle granting credit for an internship.
- **Timing of the internship:** the internship can be scheduled to begin in the first summer I and summer II sessions or to begin in the fourth semester (their second spring semester in the program) of the MS students enrolled in the automotive engineering program. For students enrolled in the automotive engineering PhD program, the internship can begin at any time after the student finishes his/her qualifying exam and is dependent on the student progress in his/her research, which is evaluated through the student PhD committee. Waiver to the internship requirement for PhD students can be granted by the Department Chair upon recommendation by the student's advisory committee.

Students enrolled in the PhD Direct option, wanting to get an MS degree enroute to a PhD, must satisfy all requirements for the MS in Automotive Engineering including the internship.

- The internship is expected to last for a total duration of six months for both the masters and the PhD automotive engineering students. A request for deviation from this policy must be initiated through the Graduate and Research Committee. Final approval is

through the Department Chair with recommendation from the Graduate and Research Committee

- The hosting company (internship provider) should be an automotive OEM, a supplier (tier1, 2, 3, etc), a service provider to the automotive industry (IT support, simulation software, infrastructure, equipment supplier robotics, materials steel, paint), or a technical or research center or institute conducting research related to the automotive industry.
- Each internship provider and internship opportunity will be evaluated by the automotive engineering faculty; students should not attend any internship opportunity without the written approval of the automotive engineering program faculty.
- The internship is classified as domestic (within the US) and international (outside the US), based on the actual location where the student will attend to his/her tasks is physically located for the 6 months period.
- Students with US citizenship should be located internationally (outside the US) for the whole period of the internship, while non-US students can attend a domestic or an international internship.
- Masters students enrolled in the internship should register for a total of 6 credit hours (part time) of AuE 890.
 - The hours are divided as follows:
 - the second Spring Semester(3 hrs)
 - summer session I and session II (1+2 hrs).
- The students are expected to keep their faculty advisor informed of their progress during the internship period and of any issues that might arise.
- The students are expected to provide two documents upon finishing their internship, one is provided by the student to describe his/her specific tasks and job duties performed during their work and the second is an evaluation of the internship provider. Additionally, the internship provider will be submitting a confidential report to describe the student progress and performance during his/her internship. See appendix for sample reports, "Employer Evaluation Form".
- The student internship will be considered successful (Graded as with A or B grade) upon reviewing the two internship reports; "Employer Evaluation of Student", and "Student Report", by the faculty advisor.
- The internships do not carry any commitment from the student, or the sponsor, or the automotive engineering program of future employment. Unless otherwise clearly indicated and a separate agreement was signed between the student and the internship provider.
- The financial compensation and other details are based on the internship provider offer letter. Most employers will not provide for any provisional expenses (such as mortgages in the US) for students. Any specific details or student special requirements or needs are considered to be the student responsibility to negotiate and include in the internship offer letter.

- The internships can be arranged through the automotive engineering program or through the student, as long as the internship provider meets and agrees to the automotive engineering and the Clemson University internship program regulations and procedures.
- The internships for the international students are conducted through the Curriculum Practical Training CPT program, and it is the student responsibility to ensure that he/she meets the CPT requirements and to keep a good standing in regard to their visa requirements and immigration status. Students are to communicate directly with the office of international affairs at Clemson University to review their specific situation.
- During the internship duration, the student is still considered a Clemson University student abiding by the Clemson University rules and regulations. The student will be considered a part-time student at the automotive engineering program.

GENERAL INFORMATION:

GRADUATE PROGRAM COORDINATOR AND GRADUATE STUDENT SERVICES COORDINATOR

Members of the Graduate Research Committee (GRC) are responsible for the graduate coordination in our Department. The Assistant Graduate Coordinator is the initial contact for graduate students arriving on campus. The Graduate Coordinator and Assistant Graduate Coordinator is the authority on regulations and procedures pertinent to the graduate programs and should be contacted whenever questions or problems occur.

ORIENTATION FOR NEW STUDENTS

Prior to registration for the first semester of study, beginning graduate students must attend the Departmental graduate orientation. The Graduate Program Coordinator will help them plan their initial program of study.

REGISTRATION

Particular attention should be paid to the requirements for registration. Any student pursuing any phase of his or her graduate program must be registered. Students are expected to make continuous progress toward their degrees and, therefore, to be enrolled for graduate credits each semester during the academic year until requirements are completed.

Full-time student status is at least 9 hours, all AuE MS students should normally enroll in 12 hours for each fall and spring semesters during the academic year. Graduate research assistants and graduate teaching assistants are required to register for a minimum of 9 and a maximum of 12 credit hours during the academic year. The minimum registration for unsupported students is 1 credit hour.

Near the middle of each semester, students will be notified of the time and procedure for on-line registration by the University. By that time, students should have prepared a program of study with the counsel of their major advisor. This is accomplished by completing form GS-2 Graduate Degree Curriculum. The **GS-2 form must be submitted and approved prior to registration for the second semester of enrollment.** Students will be required to register for next semester's courses on the computer at this time. Any deviation from courses listed on form GS-2 must be approved by the student's advisor and a new GS-2 must be resubmitted and

approved. The GS2 form can be found at http://www.grad.clemson.edu/f_general.html . The Department requires an earlier deadline for the GS2 form than the Graduate School.

Note: Registration may be blocked if the GS2 form is not completed. Also, funding may be delayed if the GS2 form is not completed.

If you are not enrolled for more than one semester the Graduate School requires a re-entry form (GS36). You must complete this form and return it to the Graduate School prior to registration. You may download this form at www.grad.clemson.edu

MAXIMUM CREDIT LOADS

The University sets upper limits on the number of credits graduate students may earn in a given semester. They are specified in the Graduate School Announcements (www.grad.clemson.edu). All requests for permission to exceed these limits must be requested by memo and approved by the Chair of the Department of Automotive Engineering and the Dean of the Graduate School.

AUTOMOTIVE ENGINEERING LECTURE & STUDENT SEMINAR SERIES

The Department of Automotive Engineering sponsors a series of typically 6-8 lectures per year by scholars in various areas of automotive engineering. The Department also sponsors a Student Seminar Series, in which AuE students will present their work-in-progress. Students are expected to attend and participate in the student series. Additionally, the automotive engineering students are required to attend the cultural immersion seminars and workshops announced through the program student services coordinator.

Since the primary purpose of graduate education is to foster scholarly development, **all graduate students are required to attend the lectures and seminars** in these series. Attendance will be taken.

FINANCIAL SUPPORT

Financial support is awarded based on availability of funds and academic merit. If a student changes his/her subject area after support has been extended, support eligibility is reviewed and funding may or may not be provided. Automotive engineering Ph.D. students pursuing research (thesis) are given priority for financial support.

Graduate students are eligible for financial support if they are (1) enrolled in full-time graduate studies, (2) in good academic standing, i.e., not on probation, and (3) making satisfactory progress toward their degree. Graduate Assistants receiving funding pay a flat fee for tuition and fees. To receive the reduced tuition and fees for a particular semester, a qualified student must be on the department payroll by end of the second week of that semester.

MS Graduate students must maintain a cumulative B average in all graduate-level courses (600-level and above). Students who fail to meet these requirements become ineligible for graduation and are placed on academic probation. The probationary status remains in effect until nine additional semester hours of graduate credit have been attempted. Students whose cumulative GPA is below a 3.0 will not receive any state funds. Also, a student who receives an "F" during any semester is not eligible for state funds for the next semester.

Supported students are required to fill out tax forms (federal and state) and the I-9 form which verifies citizenship. Two forms of identification are needed to fill out the I-9 form properly, a valid driver's license, a social security card, a passport and/or a birth certificate. The tax forms and I-9

forms are usually distributed during orientation but frequently, funding may begin at other times during the semester. If this is the case, you may pick up your tax forms and I-9 form in room 106 Fluor Daniel Building. It suggested that you fill out all required forms in a timely manner. Paychecks cannot be distributed until all parties (Graduate School, International Office, Human Resources) have approved the paperwork.

Graduate Research Assistantships (GRA)

- GRA's are employed for up to a half-time basis (up to 20 hours per week) on a research project during a specified appointment period, as indicated on your offer letter.
- GRA's are employed to assist a professor in their research activities.
- Students must be enrolled full-time (12 hrs) to receive funding.
- International students who have applied for or received their OPT should contact the Assistant Graduate Coordinator or the Departmental Payroll Staff.

Graduate Teaching Assistantships (GTA) &/or Laboratory Assistantships (GLA)

- GTA's (GLA) are employed for up to a half-time basis (20 hours per week) to assist with the teaching of courses or labs. in Automotive engineering.
- GTA's (GLA) are responsible for grading lab reports and attending GTA (GLA) meetings as needed.
- Students must be enrolled full-time (12 hrs) to receive funding.
- International students who have applied for or received their OPT should contact the Assistant Graduate Coordinator or the Departmental Payroll Staff.

Graduate Fellowships Holders

- Students must be enrolled full-time (12 hrs).

Offer Letter

Your responsibilities and details of your financial support are included in your official offer letter from our Department Chair. This letter requires your signature indicating an acceptance of the terms. GTA's (GLA's) will be notified at a later date of their teaching duties (specific course, etc). To maintain your assistantship, students must complete the duties in a satisfactory manner and make satisfactory progress towards their degree.

APPENDIX:

Automotive Engineering Course Listings

- **AuE805: Ground Vehicle Aerodynamics, 3cr. (3,0)**
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. Computational modeling approaches.
- **AuE816 Combustion and Emissions, 3cr. (2,3)**
Spark and compression ignition engines are investigated in terms of design, performance, and emissions. Exergy models. The theory of fuel air cycles are integrated with laboratory breakdown and dynamometer testing to correlate prevalent mathematical models with test results.
- **AuE817 Alternative Energy Sources, 3cr. (3,0)**
The demand for petroleum alternative propulsion sources has focused attention on hybrid vehicles with fuel cells, electric motors and battery packs, and internal combustion engines burning hydrogen and reformulated fuels. A comparison of performance, emissions, fuel efficiency, operational requirements, and vehicle configurations will be studied.
- **AuE835: Vehicle Electronics and IT: An overview, 3cr (3,0)**
This course presents an overview of vehicle electronics and IT and their impact on vehicle performance. The impact of the advent of electronics and computing on mechatronic systems integration, and vehicle reliability and warranty is discussed. Also discussed is testing and diagnostics, software standards for design and logistics, and man/machine interface.
- **AuE825: Automotive Sensors and Actuators, 3cr. (3,0)**
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. Examinations of integrated smart sensors and actuators with applications to traditional and intelligent vehicle systems.
- **AuE826 On Board Diagnostics and Reliability, 3cr. (3,0)**
Discussion of legislated state, federal and international requirements. On-board automotive sensors to monitor vehicle operation, typical diagnostic algorithms. Analytical methods for designing fault tolerant systems and assessing vehicle reliability, including safety critical systems and 'limp-home' modes. Use of hand held scanners and specialized diagnostic equipment to classify faults.
- **AuE827: Automotive Control Systems Design, 3cr. (3,0)**
Derivation of models and design of control strategies for powertrain and chassis control modules, and integration into automotive platforms. Software design, sensor selection, system architecture, diagnostics, and reliability issues are also presented. Application to engine management, transmission and chassis systems with consideration of vehicle performance, safety and information provision.
- **AuE828: Fundamentals of Vehicle Drivelines and Powertrain Integration, 3cr. (3,0)**
Vehicle powertrain arrangement, manual and automatic transmissions, automotive axles, 4-wheel and 2-wheel drives, design and manufacturing of gearing systems. Other topics such as power train control to address dynamics in gear shifting, engine balancing, fuel economy are addressed. Modeling and computer simulation is used extensively to analyze dynamic performance of various transmissions.
- **AuE829: Tire Behavior and its influence on Vehicle Performance, 3cr. (3,0)**
In-depth analysis of the tire and its influence on vehicle performance. Including: design, construction, structural response, rolling resistance, force and moment generation and their behavior under dry/wet conditions are investigated. Tire models, their limitations, and their governing equations. Tire characteristics on vehicle handling and safety. Advanced control concepts in vehicle stability/braking.

- **AuE847 Vehicle Suspension Systems Design and Analysis, 3cr. (3,0)**
 Concepts, theory, design and application of automotive suspension systems. Suspension structures, configuration, geometry, kinematics, motion, static and dynamic load conditions as well as active, semi-active and passive systems are discussed. Suspension Design Factors (SDF) and their effects are presented. Computer-aided engineering tools and other analytical techniques are demonstrated.
- **AuE848: Vehicle Braking Systems, 3cr. (3,0)**
 Vehicle braking performance; development of system specifications; regulatory, customer and manufacturer requirements; brake balance, and effects on stability and stopping distance; ABS systems; computer simulation for system performance.
- **AuE849 - Automotive Chassis and Body Systems Design, 3cr. (3,0)**
 Integrative systems approach to the design and manufacture of automotive chassis and body components. Influence of design and manufacture on the overall structural performance of the automobile, ride comfort, safety, durability, weight and cost.
- **AuE850 - Automotive Stability and Safety Systems, 3cr. (3,0)**
 Discussion of passive/active systems and design philosophies. Investigation of stability issues associated with vehicle performance and the 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, vehicle dynamic control systems are also discussed.
- **AuE853 Crash Analysis Methods and Crashworthiness, 3cr. (3,0)**
 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.
- **AuE855 Structural/Thermal Analysis Methods for Automotive Structure, Systems, and Components, 3cr. (3,0)**
 Methods to analyze the response of automotive structure, systems, and components to static, dynamic and thermal loading. Coverage of critical loading conditions and system response objectives. Analysis methods will focus on finite element approaches supplemented by simple computational methods when appropriate.
- **AuE866 Advanced Materials for Automotive Applications, 3cr. (3,0)**
 An in-depth Study of the broad range of engineering materials used in the construction of motor vehicles. Inter-relations between materials microstructure, components manufacturing process and components service behavior.
- **AuE833: Automotive Manufacturing: an Overview, 3cr. (3,0)**
 This course presents an overview of vehicle manufacturing from an OEM perspective. Issues such as supplier integration, flexible manufacturing, and quality engineering methods and their applications to manufacturing are presented. Emphasis is placed on opportunities and challenges presented with automotive manufacturing in a global environment, integrated processes, product development, flexible and agile manufacturing, supplier integration.
- **AuE867 Vehicle Manufacturing Processes I, 3cr. (3,0)**
 In-depth analysis of main component and subsystem prototyping, fabrication assembly and integration processes used during production of automotive vehicles. Design for manufacturing, computer aided manufacturing, rapid tooling technologies, technology integration, and virtual assembly are also discussed.
- **AUE832: Vehicle Development Process and Integration Tools and Methods, 3Cr. (3,0)**
 An 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 . The concept of project team and its organization is also discussed.
- **AuE875 Vehicle Development Process Tools, 3cr. (3,0)**

In-depth analysis of vehicle development process tools including representation, data management and analysis for vehicles and components. This includes in-depth study of CAD/CAE representations, optimization and packaging software, structural analysis and its use, domestic and international standards, testing and prototyping, design review, and supplier relationships is included. Case studies are also presented.

- **AuE876 Mass Customization Design for Vehicles, 3cr. (3,0)**
Concepts of platforms and product families, identification of common functionalities and the translation of functions into forms taking commonality into consideration. Designing product families and their role in vehicle design. Tie between market needs and appropriate manufacturing paradigm. Specific applications to vehicle systems designs: chassis, wiring harnesses, engines.
- **AuE877 Light-Weight Vehicle Systems Design, 3cr. (3,0)**
Methodological approaches to weight trade-off during design of vehicle systems accounting for other functions, cost, safety, materials characteristics and manufacturing constraints. Topology optimization, multi-material approaches, and identification of function optimal materials and material combinations using multi-objective formulations.
- **AuE880 Design/Manufacture Project Management, 3cr. (3,0)**
Management, leadership, socio-cultural and technical skills training for the successful management of an automotive 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.
- **AuE881 Automotive Systems- an integrated overview, 3cr. (3,0)**
Understanding of the vehicle as a complex system 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.
- **AuE882 Systems Integration Concepts and Methods, 3cr. (3,0)**
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.
- **AuE883 Applied Systems Integration, 3cr. (2,3)**
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, risk analysis, value analysis.
- **AuE884 Body and Interior Design, 3cr. (3,0)**
Fundamentals of styling design for the outer body and the interior cockpit. Concept sketching, drawing, prototyping, including virtual and physical, layered and clay based. 2D and 3D representations, brand identification, textures, materials, lighting, colors and their use in automotive industrial design.
- **AuE885 Vehicle Layout Engineering and Ergonomic Design, 3cr. (2,3)**
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 will also be covered. Case studies.
- **AuE886 Vehicle Noise, Vibration and Harshness, 3cr. (3,0)**
The application of engineering tools and specifications for noise, vibrations, and harshness. Sources, mitigation methods, complexity and influences on other vehicle functions. Design, simulation and validation methods.
- **AuE887 Methods for Vehicle Testing, 3cr. (2,3)**
Test planning for various performance regimes, data acquisition and analysis, uncertainty analysis,

sensor selection, noise filtering, data reduction methods, track testing methods. Project will include actual vehicle tests.

■ **AuE890 Engineering Project, 3-9cr. (0,3-9)**

Industrial project work culminating in writing engineering reports. Projects will cover comprehensive analytical and/or experimental treatment of phenomena of current interest in automotive engineering emphasizing modern technological problems.

Evaluation of Employer Form:



Evaluation of Employer

Michelin® Career Center

Student & Employer Information

Student's Name:

Student ID Number:

Course Code/Number:

Major:

Employer/ Location:

Name of Immediate Supervisor:

Spring, Summer or Fall Semester / Year of Internship:

General Evaluation Questions

Please evaluate your current internship site by answering the following questions as honestly as possible. The information will assist in placing future internship students.

1. How challenging was the internship position?
 - a. Very challenging most of the time
 - b. Challenging a good part of the time
 - c. Average amount of challenge
 - d. Little challenge for the most part
 - e. Very little challenge at any time

2. What was your degree of responsibility?
 - a. Immense
 - b. Challenging
 - c. Comfortable
 - d. Barely
 - e. None

3. Did you find this internship position interesting?

- a. Very interesting most of the time
- b. Interesting a good part of the time
- c. Average amount of interesting work
- d. Few interesting assignments
- e. Not very interesting at any time

4. Rate the practical value you gained through this internship

- a. Outstanding
- b. Very Good
- c. Average
- d. Below Average
- e. Unsatisfactory

5. Describe the relationship and communication patterns between you and your internship supervisor.

- a. Outstanding
- b. Very Good
- c. Average
- d. Below Average
- e. Unsatisfactory

6. Rate your internship supervisor's ability to communicate effectively with you.

- a. Outstanding
- b. Very Good
- c. Average
- d. Below Average
- e. Unsatisfactory

7. Describe the relationship and communication patterns between you and other employees.

- a. Outstanding
- b. Very Good
- c. Average
- d. Below Average
- e. Unsatisfactory

8. Describe the amount of time supervisors and other employees spent in observations and conferences with you.

- a. Spent too much time in observations and conferences
- b. Spent adequate time in observations and conferences

c. Did not spend adequate time in observations and conferences

9. The disposition of the supervisor, and other employees, in general.

- a. Facilitated learning
- b. Had no bearing on learning
- c. Impeded learning

10. If the internship site were to graded, I would rate it

_____A _____B _____C _____D _____F

Specific Evaluation Questions

Please answer the following questions as specifically and honestly as possible.

11. Describe major projects you tackled throughout the semester.

12. What were the most unattractive aspects of your internship experience?

13. How could your internship experience been improved? Explain improvements you would like to see implemented to make it more effective.

14. Explain the significance of this internship experience in relation to your future career goals. (Please list specific companies or professions you might now be interested in pursuing after graduation).

15. Describe the skills and attributes you have gained from this internship experience.

16. Please use the space below for additional comments.

Evaluation of Student Form:



Employer Evaluation of Intern Student
Michelin® Career Center

Employer Information

Employer (Company/ Organization Name):

Employer Location:

Supervisor's Name:

Student Information

Student's Name:

Position:

Spring, Summer, or Fall Semester/ Year:

Will this evaluation be discussed with the student?

General Evaluation Questions

Please indicate on a scale of 1 to 5 how this person performed during the current work period.

5-----4-----3-----2-----1-----UA
Outstanding Very Good Average Below Average Marginal Unable to Assess

- S1. ___ Adequate technical background to complete assigned projects.
- S2. ___ Ability to think critically, analytically, and creatively.
- S3. ___ Ability to take initiative and perform independently.
- S4. ___ Degree of responsibility the intern was able to handle.
- S5. ___ Ability to effectively communicate verbally and in written form.
- K6. ___ Ability to grasp new knowledge/ concepts/situations.

- K7. ___ Ability to use academic knowledge and apply it to internship assignments.
- K8. ___ Demonstrates sound judgment when making decisions.
- K9. ___ Recognition of the need for and ability to engage in life-long learning.
- A10. ___ Degree of enthusiasm/ interest in internship placement.
- A11. ___ Dependability, attendance, punctuality, and cooperation.
- A12. ___ The capacity to initiate, accept, and profit from constructive criticism.
- A13. ___ Relations with others and ability to function in a multi-disciplinary team.
- A14. ___ A sense of adequacy, self-worth, and self confidence.
- A15. ___ Understanding of professional and ethical responsibility.
- 16. ___ Likelihood that you would hire a candidate similar to this intern.
- 17. ___ Overall performance.

Specific Evaluation Questions

- 18. Describe the student's strengths as demonstrated throughout his/her internship, along with areas to work on.

- 19. Briefly describe the major project(s) "tackled" by student intern.

- 20. If you employ students from other universities in the same discipline, how does this student compare?

- 21. Please use the space below for additional comments.