1. Course Title: INSY 5860/6860/6866 Automotive Manufacturing Systems  
   Department: Industrial and Systems Engineering  
   Credit Hours: 3 hours  
   Designation: Undergraduate Elective (Required for Automotive Design & Manufacturing Minor); Graduate Elective  
   Prerequisites: Junior Standing (5860); Graduate standing (6860/6866)  
   Date Prepared: 10/17/06

2. Instructor: John L. Evans, Ph.D.  
   209 Dunstan Hall  
   jevans@eng.auburn.edu  
   844-1418  
   Office Hours: M- 1:00 – 3:00 PM or APT

3. Course Texts:  
   Additional Books May Be Added Throughout the Semester

4. Course Description:  
   An introduction to Automotive Manufacturing Systems is the focus of this course. This course reviews the history of automotive manufacturing and discusses the automotive manufacturing processes for a typical automotive assembly plant. Issues associated with automotive suppliers are presented related to processes, supply chain, product and process improvement, quality control, and costs. In addition, the issue of globalization in automotive manufacturing is investigated. Finally, a discussion of future automotive technology and its impact on manufacturing will be discussed.

5. Course Objectives:  
   Through class instruction, outside research and guest lectures students should be able to develop a general understanding of the basic concepts and issues related to automotive manufacturing systems

6. Course Requirements and Evaluation:  
   INSY 5860: Students will be evaluated based on the quality and effort for 5 outside research projects. Each project will be worth 20%. Students will be given 3 weeks to complete each assignment.

   INSY 6860/6866: Graduate students will be evaluated based on the quality and effort for 5 outside research projects. Each project will be worth 15%. The graduate projects are expected to be heavily researched and referenced to a master’s project standard. Students will be given 3 weeks to complete each assignment. In addition, 25% of the grade will be based on a research project similar to a graduate (master’s) research project. With this project, graduate students are required to contact research centers related to the student’s research topic (i.e. advanced glass manufacturing, powertrain, etc.) and select an interesting research area. The work should be pertinent to today’s manufacturing research. In addition, the student should contact the related manufacturing companies of the project area and investigate how this research can be used to further the manufacturing environment of the product.
8. **Class Policy Statements:**
   Each of the four (for 5860; five for 6860/6866) outside research projects are expected to be individual work. The fifth project (for 5860; sixth for 6860/6866) will be a team effort of one graduate student and one undergraduate student. Students can converse with other students pertaining to the projects but the work turned in must be individual effort written in his/her own words. In addition, plagiarized material is not to be turned in for grading. For all assignments, please reference all material sources including; data, photos, videos, etc. Students acknowledge this in the attached “Academy Honesty” form.

9. **Students with Disabilities:**
   Any student with a disability needing special accommodation should notify the instructor and contact Dr. Kelly Haynes, Director of the Program for Students with Disabilities, located in 1244 Haley Center, Auburn University.

10. **Course Topic Outline:**
   - **Weeks 1-2:** History of Automotive Manufacturing and the Current Automotive Environment
   - **Weeks 3-4:** Automotive Manufacturing Processes
   - **Week 5-6:** Impact of Automotive Design on Manufacturing
   - **Weeks 7-8:** Automotive Supply Chain Management
   - **Weeks 9-10:** Automotive Tier 1 Manufacturing
   - **Weeks 11-12:** Automotive Manufacturing Globalization
   - **Weeks 13-14:** Quality Standards and Issues in Automotive Manufacturing
   - **Week 15:** Future Automotive Technology and its Impact on Manufacturing

11. **Outside Research Topics**
   - **A. History of Automotive Manufacturing and the Current State of Manufacturing**
   - **C. Globalization & Automotive Manufacturing (Supply Chain, Cost, Location)**
   - **D. Tier 1 Manufacturing Processes (Team Project)**
     - i. Body/SHEET Metal/Chassis
     - ii. Interior (Seats, IP, Carpet, Panels)
     - iii. Glass
     - iv. Electronics
     - v. Powertrain (Engine Trans)
     - vi. Axle Assembly (Tire/Wheel/Brake)
     - vii. Vehicle Air/Fluids Flow (HVAC, Radiator, Fuel Pump)
   - **E. Vehicle Technology and Future Automotive Manufacturing**

12. **Contribution to Meeting the Professional Component**
    Manufacturing systems engineering offers the student a comprehensive understanding of the tools and techniques needed to meet the challenging automotive manufacturing environment. Specific focus is placed on the ability of the student to understand to actual automotive manufacturing environment and the opportunities and issues in this environment.
13. Relationship to Program Outcomes

While this course relates to several of the department’s stated ABET outcomes, the two outcomes for which assessments are taken are: c) an ability to design a system, component, or process to meet desired needs and g) an ability to communicate effectively. The first outcome (c) is defined in three areas: vehicle design, manufacturing process design, facility design for manufacturing, and supply chain design. The second outcome (g) is intended to evaluate the student’s capability to understand a complex manufacturing engineering issue and to discuss these issues in written form to illustrate the student’s understand of the material.

14. Justification for Graduate Credit

The expectations for graduate students (6860/6866) are significantly greater than undergraduate students (5860) in the 5 outside research projects. In addition, graduate students must complete an additional project as explained above in the “Course Requirements and Evaluation” section of the syllabus. Graduate students must demonstrate the ability to conduct literature reviews during their team projects which meet the university’s published standards for thesis literature review.

15. Special Considerations for COE Distance Education Courses

Methods of Delivery: The AU College of Engineering (COE), through its Graduate Outreach Program (GOP), offers selected graduate-level course work to off-campus students by various means, primarily streaming video delivered via the Internet or DVDs. Standard VHS video tape can also be produced. On-campus classes are held in specialized classrooms and are recorded each class day. Streaming video is available within a few minutes. DVDs (or tapes) are shipped the same day. Handout material made available to on-campus students is posted on the Internet or sent to off-campus students along with the tapes or DVDs.

Instructor/Student Communication: Typically, students and professors communicate via telephone and e-mail, and by exchanging documents via various means. Internet sites and discussion groups may be used to facilitate communication among the students as well as with the instructor.

Exam/Test Security: All off-campus students are required to have test proctors. These proctors serve on behalf of the instructors to maintain the integrity of the program. Proctors must be approved at the departmental level and by the Director of the GOP. Ideally, the proctor is someone in the human resources, personnel, or training and development section of the company, or agency, where the student is employed. On occasion, other personnel ranking at least one administrative level above the student serve as the proctor. In special cases, local librarians, or college testing services personnel may serve as the proctor. Responsibilities of proctors are clearly defined and, prior to approval, all proctors must agree to abide by rigorous rules related to the receipt, handling, administration, and return of tests and examinations.

Academic Honesty: All portions of the Auburn University student academic honesty code (Title X11) found in the Tiger Cub will apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Violations include, but are not limited to:

Cheating on an examination. This includes such things as copying from another’s paper, using unauthorized notes, calculators, etc., or giving or receiving unauthorized aid, such as trading examinations, whispering answers, passing notes, or using electronic devices to
transmit or receive information. This includes cell phones, blue-tooth and/or wireless. Notes stores on a PDA, laptop/pen tablet, calculator or cell phone are also prohibited.

**Plagiarism.** This is using someone else's work without giving credit. It is, for example, using ideas, phrases, papers, laboratory reports, computer programs, data - copied directly or paraphrased - that you did not arrive at on your own. Sources include published works such as book, movies, web sites, and unpublished works such as other students' papers or material from a research service. In brief, representing someone else's work as your own is academically dishonest. *The risk of plagiarism can be avoided in written work by clearly indicating, either in footnotes or in the paper itself, the source of any major or unique idea or wording that you did not arrive at on your own. Sources must be given regardless of whether the material is quoted directly or paraphrased.*

*Copying another student's assignment and putting your name on it is plagiarism.*

*Copying an answer key from an instructors guide is plagiarism.*

*Copying work from a previous semester of the class is plagiarism.*

*Electronic submission of another person’s electronic original is plagiarism.*

**Unauthorized collaboration.** This is working with or receiving help from others on graded assignments without the specific approval of the instructor. *If in doubt, seek permission from the instructor before working with others.* Students are encouraged to learn from one another: Form study groups and discuss assignments, but each assignment must be individual work unless specifically stated and turned in as a group assignment.

*You are encouraged to talk to one another about your assignments, however, all assignments must be done by the student(s) whose name is (are) on it!*

**Multiple submission.** This means using the same work to fulfill the academic requirements in more than one course. *Prior permission of the instructor is essential.*

I have read and understand the departmental and university academic honesty policy.

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Name, date