Course Syllabus
AUT 330-301 Spring 2016
Vehicle Stability and NVH

Instructor:  Ken Pickerill  
Office Phone Number: 453-9140  
Office Number: 0140D  
Office Hours:  M T R 1:00-3:00 p.m.  
Email: kdpickerill@siu.edu  
Classroom:  (TEC 0134)  
Class meeting time:  M T RF 8am-11:50

COURSE DESCRIPTION
This course is a study of the suspension and braking control systems that provide additional safety to vehicle operation. Topics covered include antilock brakes, traction control, electronic stability assist, electronic power steering, variable power steering, active suspensions, and tire pressure monitoring. Course includes techniques in diagnosing noise, vibration, and harshness (NVH) concerns.

PREREQUISITES:
AUT 215 & 216 consent of department.

COURSE OBJECTIVES:
Upon successful completion of the course, the student will:
1. Identify the basic components and operating principles of antilock brake, traction control, electronic stability assist, electronic power steering, variable power steering, active suspensions, and tire pressure monitoring systems.
2. Diagnose and repair electrical, hydraulic, and mechanical failures.
3. Understand the electrical/hydraulic/mechanical relationship in ABS, TCS, and VSA systems.
4. Understand the concepts and physics involved in NVH diagnostics.
5. Perform various measurements to identify NVH sources.
6. Perform required measurements and adjustments on the chassis controls to ensure proper operation.

TEACHING PHILOSOPHY
It is the Student’s full responsibility to Learn and the Instructors full responsibility to guide the Student through the Learning Process.

TEXT:
- Instructor Provided textbook available on SIUC Online at D2L (files can be downloaded, saved, and printed)
- Additional materials:
  Manufacturer service manuals  
  Class handouts

Policies and Standards
This school is focused on preparing students for their future career in the Automotive Industry. To prepare them for the future, students must be taught about proper work ethics and work efficacy. Proper work ethics and work efficacy is vital to the success of an employee. Thus several policies and standards are expected of the students. These policies and standards are created to help the students learn how to be punctual, prepared, effective, and efficient. Furthermore, these policies and standards are what the instructor uses to determine the students performance in the class. Students are responsible with reading and understanding the class syllabus and SIUC Automotive Technology Student Policies.
1. **Attendance:**
   - Three days of being late is considered one day of absence.
   - 2.5% points will be deducted from your total grade for each day of absence.
   - Excused absences must be discussed with the instructor.

2. **Quiz:**
   Each quiz is worth 20 points. There will be seven (7) quizzes. Quizzes can be made up within a week of the initial quiz if the absence was excused.

3. **Exams:**
   There will be one comprehensive final at the end of the semester. This will be done in the computer lab.

4. **Homework:**
   Homework will be assigned in the classroom and must be turned in on time.

5. **Research Project:**
   Each student will work in a group to produce a research paper (worth 40 points) and presentation (worth 40 points). The paper has to be a minimum of 5 pages double spaced. Proper APA citation and referencing must be used. Students will need to research on a particular system assigned by the instructor. The paper and presentation must cover the following items:
   - System purpose and overview
   - System components and operation
   - Block logic diagram
   - System Schematic
   - Wiring Schematic
   - DTC logic
   
The presentation has to meet the following guidelines:
   - Minimum of 5 minutes each person and 10 slides
   - Less than 6 bullets per slide
   - Less than 7 words per bullet

6. **Lab Activity Sheets:**
   The lab sheets are worth 40 points and will be collected and graded at the end of the semester.

7. **Participation points:**
   - 1 point will be deducted for the following:
     - Sleeping in Class or Texting
     - Not using Safety Glasses: **1 Warning**
     - Not having the proper equipment
     - Improper behavior: not participating in class, not providing input in discussion.

**Grading:**
At the end of the term, all accumulated points are added together and divided by the total class points to come up with a percentage score. The SIUC Automotive Department maintains the following grading scale:

- A = 93-100%
- B = 85-92%
- C = 77-84%
- D = 70-76%
- F = 69% or less
- INC = Incomplete

**Points Chart**

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
<th>Q7</th>
<th>Final</th>
<th>HW</th>
<th>RP</th>
<th>LW</th>
<th>PP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max points</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>100</td>
<td>20</td>
<td>80</td>
<td>40</td>
<td>20</td>
<td>400</td>
</tr>
</tbody>
</table>

**Desire 2 Learn**
[https://online.siu.edu/](https://online.siu.edu/)
WHAT SHOULD I EXPECT?

1. **Introduction:** The instructor will take attendance and inform the students of any announcements for 10 minutes.
2. **Lecture:** The instructor will lecture for about 1 hour.
3. **Lab:** The students will be given sufficient time to finish the lab sheets. Lecture and lab will be intertwined.
4. **Clean Up and Review:** Each student is given a task to fulfill.

**TOOL & SUPPLIES (Mandatory)**

- Basic tool set (as specified by the Automotive Technology Department)
- Selection of jumper leads (kits available at the Parts Store) *Must be purchased within the first week of school*
- 4 small jumper leads with alligator ends
- *Small T-Plugs (with round head)*
- 12 volt test light
- Digital multimeter

**REFERENCES:**


**Note:** Both of the above references represent the University’s and the College’s standards for written academic works. The Little, Brown Compact Handbook is a writing and grammar reference. If a student has other appropriate references to accomplish the same task, purchase of this text is not required. If the appropriateness is in question, please ask your instructor.

The American Psychological Association (APA) manual is an editorial style manual that consists of rules or guidelines to help the writer develop a clear and consistent document through common use of punctuation, abbreviations, tables, headings, citations, and many other elements.

The APA editorial style is widely accepted for academia writing. However, the focus of this class is to prepare individuals for the automotive business environment. For that reason, all writings in this class will follow normally accepted business style guidelines that the instructor will share with the students in class.

The use of the APA system of citations in written text and any accompanying reference list will however be followed. There are numerous online resources available to assist the student in the proper application of APA citation such as:

- [http://owl.english.purdue.edu/owl/resource/560/01/](http://owl.english.purdue.edu/owl/resource/560/01/)
- [http://www.apastyle.org/](http://www.apastyle.org/)
- [http://www.indiana.edu/~wts/pamphlets/apa_style.shtml](http://www.indiana.edu/~wts/pamphlets/apa_style.shtml)

If a student has other appropriate references to accomplish the task, purchase of this text is not required. If the appropriateness is in question, please ask your instructor.

**Emergency Procedures:**

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on the BERT’s website at [www.bert.siu.edu](http://www.bert.siu.edu), Department of Public Safety’s website [www.dps.siu.edu](http://www.dps.siu.edu) (disaster drop down) and in the Emergency Response Guidelines pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. **It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency.** The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.
<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Main Topic</th>
<th>HW</th>
<th>Quiz</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/30</td>
<td>1</td>
<td>Intro, Syllabus, Schedule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Noise, Vibration and Harshness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/31</td>
<td>2</td>
<td>Noise, Vibration and Harshness</td>
<td></td>
<td>Q1</td>
<td></td>
</tr>
<tr>
<td>11/3</td>
<td>3</td>
<td>Noise, Vibration and Harshness</td>
<td></td>
<td>Q2</td>
<td></td>
</tr>
<tr>
<td>11/4</td>
<td>4</td>
<td>Noise, Vibration and Harshness</td>
<td></td>
<td>Q3</td>
<td></td>
</tr>
<tr>
<td>11/6</td>
<td>5</td>
<td>Noise, Vibration and Harshness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/7</td>
<td>6</td>
<td>Noise, Vibration and Harshness</td>
<td></td>
<td>Q4</td>
<td></td>
</tr>
<tr>
<td>11/10</td>
<td>7</td>
<td>Tire Pressure Monitor Systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/11</td>
<td></td>
<td>Antilock Brake Systems</td>
<td></td>
<td>Q5</td>
<td></td>
</tr>
<tr>
<td>11/13</td>
<td>8</td>
<td>Antilock Brake Systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/14</td>
<td>9</td>
<td>Veteran’s Day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/17</td>
<td>10</td>
<td>Stability &amp; Traction Control Systems</td>
<td></td>
<td>Q6</td>
<td></td>
</tr>
<tr>
<td>11/18</td>
<td>11</td>
<td>Stability &amp; Traction Control Systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/20</td>
<td>12</td>
<td>Stability &amp; Traction Control Systems</td>
<td></td>
<td>Q7</td>
<td></td>
</tr>
<tr>
<td>11/21</td>
<td>13</td>
<td>Electronic Power Steering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/24</td>
<td>14</td>
<td>Electronic Power Steering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/25</td>
<td>15</td>
<td>Active Suspensions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/26</td>
<td></td>
<td>Thanksgiving vacation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/1</td>
<td>16</td>
<td>Active Suspension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/2</td>
<td>17</td>
<td>Class presentations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/4</td>
<td>18</td>
<td>New Trends in Vehicle Dynamics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/4</td>
<td>19</td>
<td>Final Exam</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***This is just a tentative schedule and could be subjected to changes***
>> Safety Glasses Must Be Worn at All Times in Lab <<
Use of laptops, PDA’s or cell phones is strictly prohibited during any exams or tests.

Note: All Student Policies for the Automotive Technology department apply in this class and can be found on the website.
http://siucautomotive.com/documents.html
Students are responsible to know and follow these policies at all times.