ABEN 473 - Agricultural Power

Fall 2021

Instructor: Nadia Delavarpour
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Phone: 7017308339
Office: ABEN 106
Office Hrs. 9:30 to 10:30 a.m. M, Tu, W, Th, and F.
Also, you can call for an appointment or drop by and see if I am in my office, I am usually available if I am in my office unless it is just before a class or meeting.

Class info:
Lecture: 12:00 to 12:50 p.m. M & W. ABEN room 208
Lab: 2:00 – 4:50 p.m. Wednesday (guest speakers, tours, NDSU labs and shops, etc.)

Textbook:

Course prerequisite: ME 350

Course Objectives:
1. Understand vehicle principles, equipment interface to the machine, traction, power train, and engine principles. (abet 1)
2. Conduct experiments, analyze collected information, and appropriately present the results. (abet 3 and 6)
3. Understand potential trends in off-road vehicle development. (abet 4)

Final Exam:
Final Exam is scheduled for Thursday, December 16, 2021 starting at 3:30 p.m.

Note: Anyone in the class who has a diagnosed disability or other special need should inform the instructor as soon as possible. The counseling center should also be notified so the counseling center can work with the instructor and student to best accommodate the situation. Students with disabilities needing special consideration are requested to alert me at the first class.

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1 Information concerning ABET is provided in a separate file.
General topics that will be covered in ABEN 473 lectures (subject to possible change):

1. Brief history of off-road vehicles
2. Internal combustion engines: theory, analysis, and testing
3. Superchargers and turbocharger
4. Engine and vehicle testing
5. Implement interface
6. Traction
7. Mechanical power transmission
8. Vehicle stability
9. Ergonomics in tractor design
10. Electrical power units including motors and alternative energy systems
11. CAN Bus

Lab topics (subject to possible change):

1. Excel spreadsheets for eqn. solving
2. Big Iron
3. Engine testing
4. Possible CNH testing facility tour
5. Possible CNH assembly line tour
6. Power trains
7. Slippage and traction
8. Experimental Design
9. Presentations

Grading:

The course will be graded with the following weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>1 hr. exams (ideally 2) &amp; quizzes</td>
<td>30%</td>
</tr>
<tr>
<td>Laboratory reports</td>
<td>15%</td>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Lab presentations</td>
<td>10%</td>
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<tr>
<td>Class participation</td>
<td>10%</td>
</tr>
<tr>
<td>Final exam</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

Grading system: 90% (A), 80% (B), 70% (C), 60% (D), and below failing

Homework is due by 5:00 p.m. on the due date. Homework must be given to me in class, emailed to me, or placed in my mailbox. My mailbox is located in ABEN 100. Late homework will be discounted 10% if I receive it before I have graded the assignments and 30% if I receive it after I have graded the assignments.
Quizzes may be given anytime. They may be announced or unannounced. They are worth about 10 pts each. Quizzes will be used to test the understanding of concepts and to encourage students to keep up with the material. If a quiz is missed, it cannot be made up. Generally, I drop the lowest quiz from the grades. If a quiz is missed, that is the one dropped. Extenuating circumstances may be considered at the instructor's discretion. If you expect to miss a class due to items such as interviews, professional trips, etc., please inform me by e-mail before the event. If you are caught in sudden events such as illnesses, family emergencies, etc. please inform me as soon as possible.

Guideline for Reports and HWs Format:

In the first page of your report or HW, please include information given below clearly:

1. Your name
2. Course code and title
3. Number of HW or report
4. Due date

For HW each problem should include:

1. Given parameters
2. Sketch (if applicable)
3. Considered assumptions
4. Requested issue(s) in the problem
5. Solution

Regardless of the final answer, 1 point will be deducted (per problem, as appropriate) for each of the guidelines not followed.

Clearly show all work.

In the solution section you should have the formula(s) used, formulas if rearranged, values and units in the formulas, and the solution.

Include units clearly in all stages of calculations and show how they cancel out.

Clearly mark final answer (underline or double underline).

Avoid cramming too much on the paper – it facilitates mistakes and makes it difficult to follow.

Number your paper and staple your sheets together.
Covid-19 era:

Given the changing conditions associated with the pandemic, faculty reserve the right to modify the in-class mask status of their class(es) during the semester. In case of any changes, I will notify you in advance.

The course is planned for an in-person classes and other activity. Thus, students are required to attend the lectures and labs in person.

Masks are required in all classrooms in the ABEN Department and in all public spaces in the ABEN building. If you fail to properly wear a face covering, you will not be admitted to the classroom.

Students should follow social distancing guidelines in the classroom and assigned seating will be required.

Students who cannot wear a face covering due to a medical condition or disability, or who are unable to remove a mask without assistance may seek an accommodation through the Disability Services (701-231-8463; https://www.ndsu.edu/disabilityservices/).

Food and drink are not allowed in the class unless a student has a documented accommodation through Disability Services.

In accordance with NDSU Policy 601, failure to comply with instructions, including the mask requirement, may be handled according to the Code of Student Conduct resolution process and may result in disciplinary sanctions.

For more information please visit these websites:

https://acquia.ndsu.edu/covid19/plan

https://www.ndsu.edu/police_safety/covid_19_preparedness_and_response/