ENFP 627: Smoke Detection and Management (3 credits)

Instructor:
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Description:
This course is designed to introduce the student to smoke management needs, design approaches and analytical methods. Students should develop an understanding of the performance characteristics and limitations of smoke management systems and the capabilities and limitations of analytical design aids. This course gives students an opportunity to integrate a broad range of information from previous courses with material from this course, such as fluid mechanics, heat transfer, and fire dynamics, and fire modeling. Students will review data from past experimental programs and apply computer model(s).

Text:

Grading Procedure

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
<td>100</td>
</tr>
<tr>
<td>Individual assignments</td>
<td>310</td>
</tr>
<tr>
<td>Group Assignments</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>445</td>
</tr>
</tbody>
</table>

- A  90-100% of possible points
- B  80-89% of possible points
- C  70-79% of possible points
- Etc.

Homework Policies:
All assignments are expected to be on the announced due date. Late assignments will be penalized 10% per week. Exceptions may be granted if you contact me before the due date.

Any student with special needs or concerns should see me as soon as such concerns become evident.

Please keep in mind that preserving academic integrity is essential. Information on Academic Integrity can be found at:
www.inform.umd.edu/CampusInfo/Departments/jpo/code_acinteg.html.
<table>
<thead>
<tr>
<th>Week starting with</th>
<th>Module</th>
<th>Topics</th>
<th>Individual Assignment due date (points)</th>
<th>Group Activity due date (points)</th>
</tr>
</thead>
</table>
| 8/29              | 1      | **Introduction**  
  • Problem of smoke  
  • Design objectives  
  • Smoke management approaches | Problem 1  
  9/5  
  (10) | |
| 9/5               | 2      | **Hazard of Smoke**  
  • Combustion products  
  • Tenability  
  • Visibility through smoke | Problems 1-4  
  9/12  
  (40) | |
| 9/12              | 3      | **Fire Detection**  
  • Heat detection  
  • Smoke detection | M3 Assign. #1  
  Problems 1-2  
  M3 Assign #2  
  Problems 1-3  
  9/19  
  (50) | 9/19  
  (10) |
| 9/19              | 4      | **Smoke Movement Forces**  
  • Buoyancy  
  • Gas expansion  
  • Wind  
  • Building systems | Problems 1-5  
  9/26  
  (50) | 9/26  
  (5) |
| 9/26              | 5      | **Air Movement Analysis**  
  • Leakage and air movement paths in buildings  
  • Combination of multiple paths  
  • Symmetry  
  • Network analysis/CONTAM | Problems 1-2  
  10/3  
  (20) | |
| 10/3              | 6      | **Stairwell Pressurization**  
  • Means of pressurization  
  • Vestibules  
  • Fan capacity | Problems 1-2  
  10/10  
  (50) | |
| 10/10             | 7      | **Zoned Smoke Control**  
  • Objective  
  • Design approaches  
  • Performance in sprinklered buildings | Problem 1  
  10/17  
  (20) | |
<table>
<thead>
<tr>
<th>Date</th>
<th>Date</th>
<th>Section</th>
<th>Topics</th>
<th>Assignments</th>
<th>Date</th>
</tr>
</thead>
</table>
| 10/17  | 8       | 1 to 4.2| Smoke Management in Large Spaces  
             - Opposed airflow  
             - Small-scale analysis | Assign. #1 Problems 1-3  
             10/24  
             (30)   | 10/24  
             (10)   |
| 10/24  | 8       | 4.3 to 9 | Smoke Management in Large Spaces  
             - Opposed airflow  
             - Small-scale analysis  
             Elevator Smoke Control  
             - Objective  
             - Fan capacity | Module 8: Problems 1-3  
             10/31  
             (30)   | 10/31  
             (10)   |
| 10/31  | 10      |         | Acceptance Tests  
             - Component tests  
             - Design of system tests | Problem 1  
             11/7  
             (20)   |       |
| 11/7   | Exam    |         |                               | 11/18  
             (100)  |       |

(numbers in parentheses indicate point values for each assignment, activity or exam)