TEXTS:
1. Design and Control of Concrete Mixtures by PCA (used as reference only)
2. Lecture notes for CGN 3501C (to be downloaded from the course web page)
3. Lab notes for CGN 3501C (to be downloaded from the course web page)
4. Bituminous Materials by Mang Tia (to be downloaded from the course web page)

TOPICS:
(1) CONCRETE
   a) Aggregates
   b) Portland cements
   c) Admixtures
   d) Fresh & hardened concrete
   e) Construction practices
   f) Special concrete
(2) WOOD
   a) Mechanical properties
   b) Hygroscopic properties
(3) METALS
   a) Wrought iron, cast irons & steel
   b) Effects of carbon content & work hardening on steel
   c) Non-ferrous metals
   d) Corrosion of metals
TOPICS (Continued)

(4) BITUMINOUS MATERIALS
   a) Asphalt & tar
   b) Tests on asphalt cement
   c) Liquid asphalt
   d) Asphalt paving mixtures
   e) Pavement construction

(5) PLASTICS
   a) Thermoplastics
   b) Thermosetting plastics

(6) FUNDAMENTAL MECHANICAL & THERMAL PROPERTIES OF MATERIALS
   a) Stress-strain diagram
   b) Fatigue behavior
   c) Thermal stress analysis

CGN 3501 LAB

- LAB INSTRUCTORS: David Verdugo, Telmo Tandazo, Michelle Knights & Zachary Prytula
- LAB SCHEDULE:
  - M 3:00 – 6:00 P.M., WEIL 100
  - T 3:00 – 6:00 P.M., WEIL 100
  - W 3:00 – 6:00 P.M., WEIL 100
  - Th 3:00 – 6:00 P.M., WEIL 100

Lab tests on:
- Aggregate
- Fresh concrete
- Hardened concrete
- Wood
- Metals
- Asphalt Emulsion (demonstration)

Grade Evaluation

<table>
<thead>
<tr>
<th>Test</th>
<th>Points</th>
<th>Grading Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test #1</td>
<td>100</td>
<td>450.0 - 500.0 A</td>
</tr>
<tr>
<td>Test #2</td>
<td>100</td>
<td>435.0 - 449.9 A-</td>
</tr>
<tr>
<td>Test #3</td>
<td>100</td>
<td>420.0 - 434.9 B+</td>
</tr>
<tr>
<td>Test #4</td>
<td>100</td>
<td>400.0 - 419.9 B</td>
</tr>
<tr>
<td>Lab reports and Assig.</td>
<td>100</td>
<td>385.0 - 399.9 B-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>500</td>
<td>370.0 - 384.9 C+</td>
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<tr>
<td></td>
<td></td>
<td>350.0 - 369.9 C</td>
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<tr>
<td></td>
<td></td>
<td>335.0 - 349.9 C-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>320.0 - 334.9 D+</td>
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<tr>
<td></td>
<td></td>
<td>300.0 - 319.9 D</td>
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<tr>
<td></td>
<td></td>
<td>285.0 - 299.0 D-</td>
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<tr>
<td></td>
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<td>&lt; 285.0 E</td>
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</tbody>
</table>

POLICY:

1. No make-up tests will be given except for medical reasons or unless arrangements have been made prior to test.
2. Lab reports and assignments are usually due one week following the lab or as specified by the instructor. A penalty of 10% per school day shall be assessed on materials turned in late.
3. Attendance in lab is required. If you do not attend a lab (with no valid excuse), you will receive no credit for the report for that lab. If you have a valid excuse, you still need to make up the lab by attending another lab section.
4. Class attendance will be taken. Students with a perfect attendance record will be given 5 bonus points. One penalty point will be assessed for each unexcused absence. For example, those with 2 absences will have only 3 bonus points, those with 5 absences will have zero bonus point, and those with 9 absences will have 4 penalty points.
**UNITS**

<table>
<thead>
<tr>
<th>SI</th>
<th>NON-SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENGTH</td>
<td>METER (m) - FOOT (ft) - INCH (in)</td>
</tr>
<tr>
<td>MASS</td>
<td>GRAM (g) - POUND MASS (lbf)</td>
</tr>
</tbody>
</table>

**SI**

- FORCE: NEWTON (N)
- PRESSURE: PASCAL (Pa) = N/m²
- ENERGY: JOULE (J) = N m

**NON-SI**

- FORCE: POUND FORCE (lbf)
- PRESSURE: POUND /IN² (psi)
- ENERGY: FOOT-POUND (ft-lbf)

Countries using non-SI units:

- Myanmar
- Liberia
 PREFIXES

kilo (k)  \(10^3\)
mega (M)  \(10^6\)
giga (G)  \(10^9\)
centi (c)  \(10^{-2}\)
milli (m)  \(10^{-3}\)
micro (µ)  \(10^{-6}\)
nano (n)  \(10^{-9}\)

EXAMPLES:

km
Mg
GPa
cm
mg
µm

UNIT CONVERSION

1 lbm = 454 g
1 in. = 2.54 cm
1 lbf = 4.45 N

ENERGY
1 in-lbf = (0.0254 m)(4.45 N)
= 0.113 N m
= 0.113 J

UNIT CONVERSION

DENSITY
1 lbm/ft³ = 454 g / (12 x 0.0254 m)³
= 160.33 g/m³
= 16.033 kg/m³

DENSITY OF WATER
1 g/cm³ = 1 Mg/m³ = 62.4 lbm/ft³

UNIT CONVERSION

PRESSURE
1 psi = 4.45 N / (.0254 m)²
= 6898 N / m²
= 6.898 kN / m²
= 6.898 kPa

ANNOUNCEMENTS:

1. We will have an Introduction Lab in the first week of class (1/6 – 1/9/14). Please go to your designated lab.

2. Please go to the lab in proper dress code. Please wear long pants, eye protection and leather shoes which cover all toes when you go to the lab. Those who are not properly dressed will not be allowed to be present in the lab and will be sent home. NO ONE IS ALLOWED TO BE IN THE LAB WITHOUT PROPER PROTECTIVE CLOTHING. Even if you are just dropping by to turn in a lab report or to ask a question, you still have to be in proper dress code.