SUR 4201 – Route Geometrics and Design
Course Syllabus

INSTRUCTOR:  Prof. David Gibson
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Course Website: access through UF ELearning,
or through the Geomatics web site: http://sfrc.ifas.ufl.edu/geomatics select Course Materials, select SUR 4201
or by a direct link: http://sfrc.ifas.ufl.edu/Class/SUR4201/index.html

Office Hours:  Open Door Policy: If my door is open, please come in. I'm on campus
generally from 10AM to 3 PM.

TEXT:  Course Handouts
No Required Text
Recommended Reference:  Elementary Surveying, Wolf and Ghilani

COURSE OVERVIEW:
This course covers computer route geometry along with the basics of surveying. Included are: horizontal route
design and calculation, vertical route design and calculation, cross section design and calculation, earthwork
volume calculation, spirals, earthwork analysis, superelevation, AASHTO geometric design, route project
flow, route plans, right of way, bearings, azimuths, elevations, coordinate systems.

GRADING:  A final grade for the course will be assigned based on the following point system

<table>
<thead>
<tr>
<th>ITEM</th>
<th>POSSIBLE POINTS</th>
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<tbody>
<tr>
<td>2 Midterm Quizzes @ 100 pts each</td>
<td>200 poss. points</td>
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<tr>
<td>Final exam (comprehensive)</td>
<td>100 poss. points</td>
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<tr>
<td>Required &quot;HW8 – Safe Road Evaluation&quot;</td>
<td>20 poss. points</td>
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<tr>
<td>Total poss. pts=</td>
<td>320 poss. points</td>
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Optional HWs 1-7 -- Submit for grading, receive +5 course points each for complete solution, no partial
credit.


NOTE:  Academic Honesty:
All students admitted to the University of Florida have signed a statement of academic honesty
committing themselves to be honest in all academic work and understanding that failure to comply with
this commitment will result in disciplinary action.

This statement is a reminder to uphold your obligation as a student at the University of Florida and to
be honest in all work submitted and exams taken in this class and all others.
UF Plus and Minus Grades: Note as of the summer 2009, UF has adopted a new grade policy of giving letter grades A, B, C, D, E but also optional PLUS grades B+, C+, D+ and optional MINUS grades A-, B-, C-, D-. The instructor has the option of using PLUS and/or MINUS grades. For further information on the new university grading policy see: http://www.isis.ufl.edu/minusgrades.html

SUR 4201 LECTURE TOPICS, Readings, Key text problems:

Lecture 1: Intro to Route Geometrics and Design
Lecture 2: Angles, Azimuths, Bearings
Lecture 3: Base Line Control Traverse
Assignment: see HW1 on eLearning

Lecture 4: Horizontal Alignments and Curves
Lecture 5: Horizontal Route Design Calculations, Horizontal Baseline Plotting
Assignment: see HW2 on eLearning Vista

Lecture 6: Profiles and Vertical Route Tangents
Lecture 7: Vertical Curve Theory
Lecture 8: Vertical Alignment Design
Assignment: see HW3 on eLearning

Lecture 9: Plotting Cross Sections
Lecture 10: Design Typical Sections
Lecture 11: End Areas
Lecture 12: Earthwork Volume Calculations
Lecture 13: Surface Models, TIN
Assignment: see HW4 on eLearning

Lecture 14: Intro to Spirals
Lecture 15: Spiral Comps and Formulas 2&3
Lecture 16: Insertion of Spirals
Lecture 17: Spirals Design Processes
Assignment: see HW5 on eLearning

Lecture 18: Intro to Superelevation, Eq
Lecture 19: Superelevation Design Standards
Lecture 20: Superelevation Transitions
Assignment: see HW6 on eLearning

Lecture 21: Intro to Quantities, Earthwork
Lecture 22: Mass Diagram Construction
Lecture 23: Mass Diagram Analysis (*wmv)
Assignment: see HW7 on eLearning

Lecture 24: Geometric Design Standards
Lecture 25: Sight Distance Design
Lecture 26: Safe Road Evaluation
Assignment: see HW8 on eLearning

Lecture 27: A Route Project Time Line
Lecture 28: Review of Plans 1
Lecture 29: Review of Plans 2 Review of Plans 2 Excel (pull this up and printout to help track the video)

Optional Content:
Lecture 30: Right of Way Acquisition
Lecture 31: Construction Layout Surveys:
Lecture 32: Tutorial Labs 2 and 3 Intro to Microstation:
Lecture 33: Tutorial Labs 4 and 5 Convert Graphics, Surface Modeling by TIN
Lecture 34: Tutorial Labs 6 and 8 Ground Profile, Vertical Design, Superelevation Shapes
Lecture 35: Tutorial Labs 9 and 10 Cross Sections, Slope Limits, Earthwork
Assignment: none