MEMORANDUM FOR STUDENTS ENROLLED IN CENG 2353

SUBJECT: CENG 2353 Administrative Instructions, AY102S

1. Welcome to CENG 2353 - Civil Engineering Measurements. The primary purpose of this course is to provide you with a working knowledge of the principles and methods for taking, analyzing, interpreting, and presenting various measurements from a variety of engineering systems. This will occur through a combination of classroom and laboratory activities aimed at reinforcing fundamental concepts with practical ‘hands-on’ experience. I am confident that you will find this course to be interesting, challenging, and rewarding. A tentative course schedule and introduction to the instructor are provided in Attachments 1 and 2.

Throughout this course we will explore different techniques for collecting and managing data common to various engineering systems. The content of the course is intended to provide you with an understanding of experimentation processes and a number of associated tools, including VBA programming, MATLAB, and electrical circuits. Specific course objectives are provided in Attachment 3.

2. You are expected to attend class and laboratory meetings. If you will miss a scheduled class, you are still responsible for the material. Daily attendance will be tracked.

3. You are encouraged to seek additional instruction during my office hours, before/after class, or by appointment. Take advantage of this opportunity, its FREE and really will help!

4. Class Room Procedures:
   a. I will take daily time survey data – please ensure the Time Survey Sheets are circulated.
   b. Bring study notes, textbook, note-taking material, and calculator to every class. You may not borrow or exchange calculators during graded events. If your calculator fails during a graded exercise, I am not responsible to furnish a substitute. Class preparation is your individual responsibility. Please refer to Calculator Policy below.
   c. Textbooks:
      
   d. You are not required to use colored pencils or a straight edge, but colors and straight lines sure can help with emphasis and clarity in your notes.
   e. There may be unannounced reading quizzes given at the first of class, throughout the semester. It is your responsibility to come to class having completed the reading assignment. These will be given in addition to the posted reading quizzes on Blackboard, but will also typically be taken from them.
   f. There will be posted reading quizzes on the Blackboard site (under ‘Assignments’). These will typically be available several lessons ahead of when they are due, for those who wish to get ahead in the reading. However, they are to be completed prior to coming to class on the due date of the reading assignment. These quizzes are not meant to be tricky, but rather to encourage each of you to read the required assignment and reward those who do. If you have done the reading and come up
with the reading quiz solutions, PLEASE do not share those with your fellow classmates who have not put forth an effort to read the text.

5. Course Materials:

a. I will post all course materials on Blackboard. Blackboard enrollment is now supposed to be automatic with course registration, but ensure that you can access the class Blackboard page.

b. I may also on occasion email you homework tips or points of clarification that are made aware to me outside of class. All email correspondence will take place through the Blackboard system, and therefore using your Patriot email accounts; so check your Patriot email account often.

6. Exams and Grading:

a. Grade Breakout and Cutoffs:

<table>
<thead>
<tr>
<th>Course Points</th>
<th>Grade Scale</th>
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</thead>
<tbody>
<tr>
<td>Assignments / Quizzes</td>
<td>A+ 96.67%</td>
</tr>
<tr>
<td>Laboratory Assignments</td>
<td>A 93.33%</td>
</tr>
<tr>
<td>Professional Practice Grade</td>
<td>A- 90.00%</td>
</tr>
<tr>
<td>Midterm Exams (2 at 200 each)</td>
<td>B+ 86.67%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>B 83.33%</td>
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<tr>
<td></td>
<td>B- 80.00%</td>
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<tr>
<td></td>
<td>C+ 76.67%</td>
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<td>C 73.33%</td>
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<td>C- 70.00%</td>
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<td></td>
<td>D 65.00%</td>
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<tr>
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<td>F &lt;65.00%</td>
</tr>
</tbody>
</table>

Standard DEPARTMENT cutoffs for your personal growth are shown above. UNIVERSITY GRADE BREAKS WILL BE USED IN FINAL GRADE POSTING.

If you earn a cumulative average of less than 65% on all exams, or if you fail to earn at least 50% on the final exam you may fail the course, regardless of your course grade. Of course, final grades are only A, B, C, D, F. Therefore, a C- is a C for a final grade. The distribution shown above is to graphically remind you of how well you are doing.

b. Mid-term Exams and Final Exam:

1) The dates for all exams are included in the course schedule. Official reasons for missing an exam are outlined in the UT Student Handbook. You are required to take a make-up Exam, regardless of your reason for missing the scheduled Exam. Report any conflict to me as soon as possible prior to the Exam.

2) The mid-term exams and final exam are closed book. You can use a TI-30 calculator (or FE equivalent see calculator policy below) and certain CENG 2353 reference sheets.

3) Use the restroom prior to coming to class to take an exam! Suspicious restroom breaks in the middle of an exam are not acceptable.
4) Exam solutions will not be posted on Blackboard. You may come by my office to check the solutions to exams.

c. Calculator Policy:
Only NCEES approved calculators will be permitted during tests and your test will be collected and your grade will be a zero if you are caught using a non-approved calculator.

d. Laptops/PDAs/MP3 players/Cell Phones or other electronic devices:
The use of any electronic device, except an approved calculator, is not permitted during exams. Your exam will be collected and your grade will be a zero if you are caught using a non-approved electronic device. The use of phones and MP3 players is not permitted during lessons.

e. Collection of Student Work: Throughout the semester I will collect student work (best, average, and worst) for the ABET course and outcomes notebooks. This will require me to make a copy of your work, keep your original and return a copy of the graded work to you. I will not draw attention as to what level of work you accomplished.

f. Embedded indicators of accomplishment of program outcomes: At times throughout the semester, portions of student work will be analyzed to determine if our program is accomplishing stated program outcomes based on established metrics. If your work is below the minimum established metric, you will be required to repeat the assignment or that portion of the assignment until you achieve the minimum acceptable standard based on the metric.

7. Homework: Homework problems will typically be assigned on a daily basis. Students may discuss their homework solutions with one another, but each student must submit their own, independent solutions (i.e. you may not just copy someone else’s homework). If you receive assistance from a fellow student on a particular problem you must cite that assistance within your solution. The homework due date will be clearly given with the homework assignment. Homework is due at the beginning of class on the due date. Late submittals may be turned in directly to me in my office, or placed in the FAN (CENG 2353) folder in the CE office (RBS 1003).

**HOMEWORK FORMAT:** The production of a neat, organized, high-quality homework assignment cannot be overestimated nor can its importance to your course grade be overstated. A homework assignment should be something you are proud of and not something hastily “slapped together”. Toward this end, considerable emphasis will be placed on not only getting the correct answer but also on how the solution is presented.

All homework is mandatory and becomes part of your grade. Failure to submit any required homework will result in an incomplete. As an engineer your goal is to make a clear, logical, and professional presentation of your work, which is both accurate and correct. As such both your presentation and the accuracy of your work are important, and both will be graded. It is critical that you show all of your work and leave “footprints” so that it can be easily followed. This means that equation numbers, figures, or other tools used should be clearly identified.

a. Problem Sets:

1) **Use Engineer paper only or full-page printouts from Matlab, Mathcad, Excel, etc.** You may neatly tape or glue short computer printouts onto Engineer paper at the appropriate place in the logical flow of the problem. Only use one side of a page. Clearly present a brief problem statement and a sketch with your solution. Clearly and concisely explain each step. For narratives of more than a line or two, use your word processor or the text capability if you are using MathCAD or Excel. If you are writing out a paragraph or more, you must type it.
2) Late Submissions. It is a basic principle of professionalism that “Professionals are not late.” A “COORDINATED LATE” submission occurs when you will miss the deadline for a graded homework assignment and you contact me in advance. Notification immediately before the submission will not suffice. Deductions to your assignment grade for late submissions will be given as follows:

1. 0-24 hours late: a deduction of 25% of the earned grade
2. 24-48 hours late: a deduction of 50% of the earned grade
3. More than 48 hours late: No credit. Assignments must still be submitted.

Obviously there are circumstances that can occur that make a timely submission impossible and I will work with you when and if they occur.

3) All homework in this course must be properly documented. As you are having your work reviewed it is likely that you might receive help from your classmates, just simply document it. Information from the course textbooks (equations and outlines of procedures), class notes, or me is considered immediately available to all students and need not be acknowledged or documented. YOU ARE REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED. Documentation will be accomplished in accordance with any manual for writing, footnote or endnote, for papers, but for written homework, just place the documentation right at the point you received help using who and what assistance.

b. Assigned readings: Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (I will not cover everything). It will also make you more familiar with terms and concepts to be covered. Reading the assignment prior to attending class will enhance your ability to learn!

8. There may be several opportunities to earn bonus points for additional work on problem sets, exams, or for completion of other optional assignments. Opportunities for bonus points will be clearly identified by me and announced in class. Make use of these opportunities to extend your learning!

9. Professional Practice. During this semester, a portion of your grade in this course (10%) will be derived from a level of professional practice expectations. These expectations include a professional demeanor and work ethic (attitude), consistent daily preparation (assignment reading, appropriate materials brought to class, etc.), commitment to learning and fulfilling obligations (attendance, on time), and being engaged in class activities (participation).

10. Academic Misconduct: Plagiarism of homework and cheating on examinations will be interpreted as academic misconduct and will not be tolerated. Please refer to the University of Texas at Tyler current Undergraduate Catalog for academic policies and Manual of Policies and Procedures for Student Affairs (MOPPS, Chapter 8) regarding academic integrity, cheating and plagiarism. Academic dishonesty will not be tolerated. Ignorance of the rules and policies provides no protection from the consequences.

11. Students Rights and Responsibilities. To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html

12. Grade Replacement/Forgiveness. If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point.
average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

13. State-Mandated Course Drop Policy. Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the 12th day of class (See Schedule of Classes for the specific date). Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard. Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

14. Disability Services. In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079.

15. Student Absence due to Religious Observance. Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

16. Student Absence for University-Sponsored Events and Activities. If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

17. Social Security and FERPA Statement. It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

18. Emergency Exits and Evacuation. Everyone is required to exit the building when a fire alarm goes off. Follow your instructor’s directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do Not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Attachments x3

Wei (David) Fan
Ph.D., P.E.
CENG 2353
Tentative Laboratory Topics
Statistical Analysis
VBA Programming
MATLAB Applications
DC Circuit Behavior
Wheatstone Bridge
Cantilever Flexure
Material Behavior in Compression
Material Behavior in Tension
Measuring Fluid Flow

Creative Laboratory Assignments
Distance and Area Lab
Velocity Lab
Friction Lab
# CENG 2353 Civil Engineering Measurements Course Schedule – Spring 2011 (102S)

**Meets** WF 11:00AM - 11:50AM for Lectures and TF 2:00PM - 4:40PM for Labs  
**As of January 18, 2011**

<table>
<thead>
<tr>
<th>Les. #</th>
<th>Lab #</th>
<th>Date</th>
<th>Topic</th>
<th>Homework</th>
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<tbody>
<tr>
<td>1</td>
<td>L1</td>
<td>1/19</td>
<td>Course Introduction</td>
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<tr>
<td>2</td>
<td></td>
<td>1/18 &amp; 1/21</td>
<td>Laboratory 1</td>
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<tr>
<td>3</td>
<td>L2</td>
<td>1/26</td>
<td>Regression Analysis</td>
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<tr>
<td>4</td>
<td></td>
<td>1/25 &amp; 1/28</td>
<td>Laboratory 2</td>
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<tr>
<td>5</td>
<td>L3</td>
<td>2/2</td>
<td>Basic Programming Language Elements</td>
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<td>6</td>
<td></td>
<td>2/1 &amp; 2/4</td>
<td>Laboratory 3</td>
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<tr>
<td>7</td>
<td>L4</td>
<td>2/9</td>
<td>Matrices and Matrix Operations</td>
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<td>8</td>
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<td>2/8 &amp; 2/11</td>
<td>Laboratory 4</td>
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<td>9</td>
<td>L5</td>
<td>2/16</td>
<td>Introduction to DC Circuits</td>
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<td>10</td>
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<td>2/15 &amp; 2/18</td>
<td>Laboratory 5</td>
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<td>11</td>
<td>L6</td>
<td>2/23</td>
<td>Analog and Digital Recording</td>
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<td>2/25</td>
<td><strong>Mid Term Examination #1</strong></td>
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<td>13</td>
<td>L7</td>
<td>3/2</td>
<td>Current Based Sensors</td>
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<td>14</td>
<td></td>
<td>3/1 &amp; 3/4</td>
<td>Laboratory 7</td>
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<tr>
<td>15</td>
<td>L8</td>
<td>3/16</td>
<td>Resolution, Sensitivity, and Filters</td>
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<td>16</td>
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<td>3/15 &amp; 3/18</td>
<td>Laboratory 8</td>
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<tr>
<td>17</td>
<td>L9</td>
<td>3/23</td>
<td>Strain Gages and Wheatstone Bridge</td>
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<td>18</td>
<td></td>
<td>3/22 &amp; 3/25</td>
<td>Laboratory 9</td>
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<tr>
<td>19</td>
<td>L10</td>
<td>3/30</td>
<td>Instruments for Small Displacements</td>
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<td>20</td>
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<td>3/29 &amp; 4/1</td>
<td>Laboratory 10</td>
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<td>21</td>
<td>L11</td>
<td>4/6</td>
<td>Falling Sphere</td>
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<td>22</td>
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<td>4/5 &amp; 4/8</td>
<td>Laboratory 11</td>
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<tr>
<td>23</td>
<td>L12</td>
<td>4/13</td>
<td>Measuring Velocity and Acceleration</td>
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<tr>
<td>24</td>
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<td>4/12 &amp; 4/15</td>
<td>Laboratory 12</td>
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<tr>
<td>25</td>
<td>L13</td>
<td>4/20</td>
<td>Digital Image Correlations</td>
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<tr>
<td>26</td>
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<td>4/19 &amp; 4/22</td>
<td>Laboratory 13</td>
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<tr>
<td>27</td>
<td>L14</td>
<td>4/27</td>
<td>Non-Destructive Testing</td>
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<td>28</td>
<td></td>
<td>4/26 &amp; 4/29</td>
<td>Laboratory 14</td>
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<td>29</td>
<td>L15</td>
<td>5/4</td>
<td>Measurement Applications in Civil Engineering</td>
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<tr>
<td>30</td>
<td></td>
<td>5/3 &amp; 5/6</td>
<td>Laboratory 15</td>
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<td></td>
<td>5/6</td>
<td>Course Summary</td>
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</table>

**FINAL EXAM, tentatively scheduled for Wednesday 5/11/11, 12:30 p.m. – 2:30 p.m.**

Homework assignments will be given nearly daily throughout the semester, with due dates clearly defined.

Homework handout sheets will be provided during class, as well as posted on the class Blackboard page.

Homework solutions will also be posted on the Blackboard page. Be sure to clarify and fix anything you may have been unsure of.
Dr. Wei (David) Fan
Position: Assistant Professor
Office Building/Room: RBS 1005 (Ratliff Building South)
Phone: (903) 565-5711
Email: wfan@uttyler.edu
Office Hours: M-F 1-3 PM

Education
The University of Texas at Austin Civil Engineering - Transportation PhD May 2004

Professional Society
Associate Editor, IEEE Transactions on Intelligent Transportation Systems, 2007 – Present
Member, Editorial Board, World Review of Intermodal Transportation Research, 2007 – Present
Member, Editorial Board, International Journal of Revenue Management, 2007 – Present
Member, Technical Committee on Emerging and Innovative Public Transport and Technologies
(AP020), Committee on Transportation and Economic Development (ADD10), and Committee on
Paratransit (AP060), Transportation Research Board, National Research Council, National Academy
of Sciences and National Academy of Engineering, 2007 –
Member, Technical Advisory Panel (TAP) for the Research Management Committee 2 (RMC-2) and
Committee 4 (RMC-4) of the Texas Department of Transportation, Austin, Texas

Reviewer:
Prestigious Journals refereed: (Reviewed more than 40 journal papers in the past two years)
Transportation Science
Transportation Research Record (TRR), National Research Council, National Academy of Sciences
Transportation Research Part C: Emerging Technologies
ASCE Journal of Transportation Engineering
ASCE Journal of Computing in Civil Engineering
ASCE Journal of Computer-Aided Civil and Infrastructure Engineering
Journal of Public Transportation
Journal of Transport Geography
Journal of the Eastern Asia Society for Transportation Studies
IEEE Transactions - Intelligent Transportation Systems
World Review of Intermodal Transportation Research International Journal of Revenue Management
European Journal of Operational Research
Conferences refereed: (Reviewed more than 20 manuscripts in the past two years)
Transportation Research Board (TRB), National Research Council, National Academy of Sciences

Journal Publications, Conference Proceedings, and Presentations (Over 30)

Course Taught Before at UT Tyler
ENGR 2301 Statics CENG 2336 Geomatics
CENG 2353 Civil Engineering Measurements
ENGR 3301 Probability & Statistics for Engineers
CENG 3351 Transportation Engineering
CENG 4351 Traffic Engineering: Operations and Control (with Lab)
CENG 5353 Operations Research and Advanced Mathematics (Graduate Level)
CENG 5354 Urban Transportation Planning (Graduate Level)
CENG 5355 Transportation Systems Management and Operations (Graduate Level)
CENG 5357 Public Transportation Engineering (Graduate Level)

Personal Information
Wife, Grace Daughter, Jennifer, Age 6 years Son, Peter, Age 4 years

Professional Registration: Professional Civil Engineer, Texas, 2009
Favorite Movie: Forrest Gump What’s Love Got to Do with It?
Favorite Sports & Team: NBA, San Antonio Spurs
Hero: Tim Duncan Super Hero: Grace
CENG 2353 Course Objectives:

1. Develop an organized approach to design an experimental measurement system and conduct a physical experiment to solve Civil Engineering system analysis and design problems.

2. Analyze DC circuits consisting of combinations of series and parallel connections using Kirchoff’s Voltage Law and Current Law and get their equivalent circuit using the current loops methods.

3. Explain the process, components, and principles involved in a measurement system, data acquisition system, analog and digital recording instruments, sensors, and transducers, signal conditioning circuits, the resolution of the A/D converter and systems, filters.

4. Explain resistance-type strain gages and the strain measurement, analyze the Wheatstone bridge, interpret the strain gage bridges, and perform calibration of measurement systems using simple/multiple linear regression models, and time series analysis.

5. Use spreadsheets and math solving programs as tools to perform the mathematical operations required in Civil Engineering measurements.

6. Use Excel spreadsheets and MathCAD programs as tools to perform system calibration, run regressions, understand the results, and interpret the models required in Civil Engineering measurements.

7. Use MATLAB and Visual Basic programming as tools to perform system calibration, run regressions, understand the results, and interpret the models required in Civil Engineering measurements.