Course Objective: Introduce methods for effective statistical quality control and productivity improvement
Prerequisite: ST302 (basic statistical inference)

**SYLLABUS and TENTATIVE SCHEDULE**

**Getting Started**
Weeks 1-3
Philosophy and basic concepts of quality improvement (Chapter 1); Summarizing data (2.1); Distribution theory (Section 2.2-2.4); Statistical inference (Chapter 3).

**SPC: Process Capability, Monitoring, and Control**
Weeks 3-8
Capability indices (Chapter 9); Conceptual and statistical aspects of control charts (Chapter 4); Some control charting techniques (Chapters 5-8).

**Process/Productivity Improvement**
Weeks 8-11
Design of experiments (Chapters 10-11); Optimization (Chapter 12).

**Case Studies**
Weeks 12-15

**Presentations**
Week 16

**Homework.** Up to two late homework assignments (**due in class the following lecture period, or not accepted at all**) will be accepted without penalty. All other late assignments will receive 75% of their potential score.

**Project.** Choice of topic for this project may range from a report on some related research articles, to case studies of published or simulated data, to particular job related projects with which you are involved. A written project report and presentation will be required. Periodic submittal of drafts will be required throughout the semester, culminating in the final version and presentation to be due the last week of classes. Unless we have an abundance of topics that people want to work on, this will likely be a group effort consisting of about 5 people.

**Examinations.** There will be two mid-semester exams: one on Friday 9/24/99, the other on Friday 11/19/99. The exams will be “closed book, closed notes” and calculators are strongly encouraged. “Cheat sheets” are allowed as follows: both sides of two \( \frac{8.5}{11} \times 11 \) sheets for Exam 1, and four sheets for Exam 2. No makeup exams will be given. If you miss one exam (actually, you may even take the exam but not turn it in), for whatever reason, your project will count 50% of your grade. Only one exam may be missed in this fashion. If you miss both exams, your project will 50% of your grade and the remaining 25% will be lost.

**Computer Usage.** Some lectures will be held in the SICL lab located on the ground floor of Harrelson Hall. The SAS system will be used for generating graphics, summarizing data, generating control charts, analyzing data, etc. Knowledge of SAS is not a prerequisite, but moderate familiarity with the **UNITY** computer network is assumed.
Class files are in locker st435_info. Type `add st435_info` at the UNITY prompt to access these files. The files will then be in the `/ncsu/st435_info` directory. To run SAS programs, type `add sas` to add the locker, then `sas` to activate the software in interactive mode.

SICL hours of availability are given at [www.stat.ncsu.edu/admin](http://www.stat.ncsu.edu/admin) (page down to SICL Affairs, then select Fall 1999 SICL Schedule). Many other computer labs are available; see [www2.ncsu.edu/ncsu/cc/pub/CC_facilities.html](http://www2.ncsu.edu/ncsu/cc/pub/CC_facilities.html).

**Assignment of GRADES.** Course grades will NOT be assigned on the +/− scale.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
</tr>
<tr>
<td>Exam 1</td>
<td>25%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>25%</td>
</tr>
<tr>
<td>Project</td>
<td>25%</td>
</tr>
</tbody>
</table>

Questions concerning the grading of homeworks and exams must be raised by the class period following their return. Please see me for questions about the exams and see the TA for questions about the homeworks. If concerns about homeworks are not satisfactorily addressed, then feel free to discuss these issues with me.

Solutions to homeworks will be available for two hour check-out in the Reserve Room of the D. H. Hill Library.

**ACADEMIC INTEGRITY POLICY:** Please refer to the university policy as described in the Code of Student Conduct handbook. For this course, group working on homework assignments is encouraged. Copying solutions from other students (past or present) is, however, strictly prohibited. All exam solutions should be a result of only your work. If this policy has been found to be violated, no credit will be given for the assignment in question.

**References**

Modern Methods for Quality Control and Improvement, by Wadsworth, Stephens and Godfrey.

Statistical Methods for Quality, with Applications to Engineering and Management, by Irwin Miller and Marylees Miller. 1995.