INTRO. TO PROBABILITY & STATISTICS (MA171)

WINTER 2005, Dr. SUJAY DATTA
Dept. of Math. & Comp. Sci., NMU

SYLLABUS, RULES & REGULATIONS

- **Meeting time**: 11:00-11:50 P.M. (M.W.Th.F.)
- **Textbook**: '*General Statistics*' (Warren Chase & Fred Bown), 4th ed.
- **Syllabus**: (1) What is statistics? Its various components and how they are related, the importance of sampling 'properly'; (2) Organizing and describing univariate data (graphically and numerically); (3) Describing bivariate data (graphically and numerically), (4) Quantifying uncertainty: the basics of probability theory; (5) Probability distributions for discrete random variables and the Binomial distribution; (6) Probability densities for continuous random variables and the Normal density; (7) The sample-mean as a random variable: the central limit theorem; (8) Statistical inference concerning population-means and population proportions: large-sample and small-sample confidence intervals and hypothesis testing; (9) Statistical inference comparing two population-parameters; (10) Statistical inference concerning regression and correlation (if time permits).
- **Instructor's whereabouts**: Office in New Science Facility(#1107), phone # 227-1584, email: sdatta.
- **Office hours**: M.W.Th.F. 9:15-11:00 A.M. and 1:00-2:00 P.M.
- **Tools required**: Any scientific calculator with the necessary statistical functions will be fine, but if you <u>are</u> going to use anything other than the TI-Interactive on your IBM Thinkpad, it is <u>your</u> responsibility to read and learn from the manual. However, you can also use the software MINITAB, to avoid buying a new calculator. MINITAB (on your Thinkpad) will be extensively used, and may render a calculator unnecessary.
- **Prerequisite**: A "C-" or better in MA103 or MA104 or MA105, or a clear recommendation by the placement test. Anyone without these <u>must</u> see me in my office during the <u>first</u> week of classes to discuss eligibility for this course. In such cases, one's performance in the mathematics aptitude test (that will be given during the first week of classes) becomes the basis for eligibility.
- **Evaluation & grading**: (a) There will be 4 <u>classtests</u> (1 every month) and several <u>short quizzes</u>. Every other day, a few <u>homework problems</u> will be given and within a week, these homework problems will be <u>discussed in the class</u>. During these discussions, students will be sent to the chalkboard to solve problems within a given amount of time and their performance will be recorded (as "did correctly" or "couldn't complete but was on the right track" or "had no clue"). Homework assignments will only <u>occasionally</u> be collected and graded (2 or 3 times during the entire course), but it is strongly recommended that you do all the homework problems for your own benefit. Near the end of the course, there will be a <u>data-analysis project</u> involving MINITAB and at the end of the semester, there will be a <u>final</u>. The <u>classtests</u> will be worth 40% of your final composite

score, the quizzes will be worth 30 %, the data-analysis project will be worth 5 %, the graded homeworks will be worth 5 % and the final will be worth 10 %.

(b) The lowest classtest score and the lowest quiz score will be automatically dropped. No classtest, quiz or homework will be individually curved. However, there may be a curve at the end of the semester when I have every item from each of you. The final is a 'must'.

(c) The remaining 10 % of your final composite score will be reserved for class participation (i.e. solving problems on the board in the class, answering questions thrown at you during the lecture, etc.) and attendance (i.e. how regularly you are coming to the lectures). Records of these will be kept for each of you individually.

- **Grade ranges**: A final composite score of 90 % or above is an 'A', at least 85 % and less than 90 % is an 'A-', at least 80 % and less than 85 % is a 'B+', at least 75 % and less than 80 % is a 'B', at least 70 % and less than 75 % is a 'B-', 65 % – < 70 % is a 'C+', 60 % – < 65 % is a 'C', and so on.

- **Automatic lowering of grade**: There are certain things which will automatically lower your final composite grade by one or more point(s), no matter how well you do in the course. You will have your final composite grade **lowered by one full point** (e.g., an A- will become a B-) if (a) there are more than 7 days of *unexcused absences* (an absence is *unexcused* if, upon returning to class, the student does not immediately come to my office to discuss what he/she has missed and collect the associated study-material), **or (b)** you fail to maintain at least a 'C' or 60 % in the category "class participation and attendance" all through the semester. (Here's how to compute your approximate grade in this category for yourself: divide the # days you have been in the class by the *total* # class-days until today, and convert it to a percentage by multiplying it with 100. Then divide the # times you have answered a question or solved a problem in the class *correctly* within the given time-limit by the *total* # questions you have been asked, and then convert it to a percentage. **Note** that I am talking about the questions that you are specifically asked by name, not the general questions thrown at the whole class). The average of these two percentages is roughly your grade in this category. But you can come and ask me anytime what your grade is if you are not sure), **or (c)** your composite score (based on everything that you have done so far) falls below C (i.e. 60 %) and you ignore my request to come and see me (or a MATH LAB tutor designated by me) for help regularly until your composite score rises above C (in other words, visits to me during my office hours or by appointment and/or to a tutor are mandatory for anyone performing below the C level).

- **What you should expect from this course**: (a) a good *working knowledge* in the topics covered and an adequate experience in data analysis (you may *not* have enough time to become *experts*, but we'll try!) (b) a lot of problem solving in the class (sometimes from the textbook, but often from outside), (c) explanatory handouts and notes whenever necessary, (d) answers to all tests, quizzes and homework problems, (e) prompt grading of tests and quizzes (usually you will get them back within the same week), (f) plenty of help outside the class. Just see me during my office-hours or make appointments.

- **What you should NOT expect from this course**: (a) DON'T expect the tests and quizzes to be easy! They will be closed-book, will have questions from outside the book, will have questions not discussed in the class (just to encourage you to be innovative). In short, they will be *challenging* and sometimes *hard*— to really make you *think*. (b) DON'T expect that *everything* will be covered in the class. You will have to put in a lot of efforts at home to supplement what is done in the class. (c) DON'T expect the grading standard to be too easy or lenient. Usually

I am a strict grader and don't give away A's easily. You'll have to earn your good grade! (But don't worry too much! I do give partial credits and second chances to improve upon low scores). (d) DON'T expect that we will *always* stick to the book. We will often go outside it and cover materials in a different order than it. For example, I may sometimes ask you to skip a section from your textbook and read it entirely from my handouts. (e) DON'T expect that "learning to use a calculator or a software package" is our main objective in this class. It is NOT! I'll teach you how so solve problems on your Thinkpads, but you MUST also learn how to do them *by hand* using mathematical and statistical techniques (that's our primary goal!).

- **What I expect of you**: I hope you will (a) attend lectures regularly and keep yourself up-to-date, since it is *impossible* to catch up with the materials covered over a fourteen-week period at the last moment, (b) ask a lot of questions in class whenever you have doubts (don't worry! No question is 'foolish'.), (c) not miss a lot of quizzes/classtests/homeworks (by the way, NO makeup quiz is allowed at any time, and only makeup classtests for "excused absences" are allowed), (d) come to the class prepared, so you can participate in the class discussion, and (e) be attentive to the lectures/problem sessions instead of surfing the WEB or playing with your laptop (I will be seriously offended if I find you doing so).

- **You shouldn't be in this class if**: (a) you don't have the prerequisite or a recommendation from the math. placement test, (b) you think you won't be able to avoid the things (listed above) that will automatically lower your grade point, (c) you think the items mentioned above under the headings "What you should expect from this course", "What you should not expect from this course" and "What I expect of you" are unacceptable to you. **Good Luck & Thanks!**

- **Disability-related services**: If you have a need for disability-related accommodations or services, please inform the **Coordinator of Disability Services** in the Disability Services Office at 2001 C.B. Hedgcock (phone # 227-1700; TTY 227-1543). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation and in accordance with Federal, State and University guidelines.

- **NOTE:** This course satisfies the *Formal Communication Studies* requirement. These courses are designed to introduce students to the ways in which, information and ideas are expressed usig a communication system other than English. Such courses should foster the student's ability to conceptualize and communicate in an orderly and rational manner. Characteristics of a communication system include: (1) possession of a grammar, (2) operation under an established set of rules, (3) reasoning properties such as deduction, inference drawing and problem solving. This includes courses in languages and courses in which the central focus is on statistics, computers or formal logic.