

## SYLLABUS FOR MTH U117- Sequence A

### Instructors and Office Hours:

Professor Carla Oblas, 373- 2328, e-mail c.oblas@neu.edu, 102 Cahners Hall  
Office hours: Mon and Wed 1:30-2:30 and Thurs 3-4 or by appointment.

**Course Objectives:** This course is designed to develop problem-solving skills while learning to apply mathematics to real life situations. Mathematical concepts to be studied: normal distribution and standard deviation; graphs of linear and non-linear functions, the concept of derivative, derivatives for exponential functions,  $e$ ; topics in probability, binomial distributions, central limit theorem, polling theory.

**Styles of Learning:** This course will make extensive use of collaborative groups, although grading will be based on individual work. It is designed for the student who enjoys hands-on activities, social interaction and pondering mathematical questions.

**Books:** *The Pit and The Pendulum*, *Small World*, and *Pollsters Dilemma*. Purchase packet at Gnomon Copy. You will need to bring the unit under investigation to class everyday

**Materials:** A graphing calculator is required for this course equivalent to the TI 83. You will need to bring this to class everyday. You will also need graph paper.

**Attendance:** Daily attendance is required. Since emergencies may arise, students are allowed 4 absences. That is 4 absences **no matter what the reason**. Students who have more than four absences will be required to withdraw. **There are no make up tests**. Do not miss a test!

**Cell Phones:** Keep them turned off!

**Help:** Besides my office hours, assistance is available at the Academic Assistance Center Sign-up for appointments in 102 Cahners Hall

|                                                               |     |
|---------------------------------------------------------------|-----|
| <b>Grading:</b> Daily Homework (due on time, 4 late accepted) | 10% |
| Problems of the Week (POWs) (on time and typed)               | 20% |
| Portfolios (on time and typed)                                | 20% |
| Tests                                                         | 25% |
| Final                                                         | 25% |

**Late Work:** Four late home works are allowed. POWs will not be accepted more than one class period late. Portfolios will not be accepted late.

**Proficiency Requirement:** Students passing this course with a C or better will satisfy the College of Arts and Sciences Category I mathematics requirement. Students who are

seeking to satisfy this requirement but earn less than a C have two choices: 1) retake MTH U117 earn a C better, or 2) take MTHU115 and receive a C or better.

**Finals:** Our final is on Dec 15 at 10:30 am. No student will be given a request for a special final exam unless it is due to a registrar created conflict.

Note: It is your responsibility to be aware of any changes to this syllabus that are announced in class. If you have any concerns about the course that cannot be resolved with me, please see Prof. King in 447 Lake, x5679. It is the University policy that no grade, including an incomplete, can be changed after one year. Exceptions must be authorized by the Academic Standing Committee.

| <u>CLASSWORK</u>                                                                                                                                                             | <u>HOMEWORK</u><br><u>(due next class unless specified)</u>                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Sept 9 The Unit Question for Pit and the Pendulum p. 2-5<br>Time is Relative p. 6<br>Your Pulse p. 6<br>Start What's Rare p.8-9                                              | a) Initial Experiment p. 5<br>b) POW Shuttling Around p.115-116 due Sept. 16<br>c) Flipping Coins p.7                                    |
| Sept 13 Finish What's Rare p. 8-9<br>Normal Distribution and Standard Deviation (of Pulse data) by hand p.10-13<br>Standard Deviation using TI 83 (of Pulse and Timing) p.15 | a) Penny Weight p. 14<br>b) Deviation p. 16                                                                                              |
| Sept 16 The Standard Pendulum p.17<br><br>Pendulum Variations p.19                                                                                                           | a) Use Standard Deviation on Penny Weight p. 14<br>b) Conclusions about the Standard Pendulum p.18<br>c) More on Standard Deviation p.20 |
| Sept 20 Bird Houses p.21-23<br>Using the calculator to graph points and curves, using table and window<br>Start Graphing Free-for All p.27-28                                | a) POW Sticky Gum p.107-108 due Sept 27<br>b) More on Standard Deviation p.20                                                            |
| Sept 23 Graphing Free-for-all finished and summarized                                                                                                                        | a) Graphs in Search of Equations I and II p.27 and 28<br><br>b) The Brake! P. 31                                                         |
| Sept 27 The Period and the Length p.30<br>The Thirty Foot Prediction<br><br>Review for test                                                                                  | a) Portfolio due Oct 4                                                                                                                   |
| Sept 30 Building the 30 foot Pendulum                                                                                                                                        |                                                                                                                                          |

|                                                                               |                                                               |
|-------------------------------------------------------------------------------|---------------------------------------------------------------|
| Oct 4 Unit Question for Small World<br>How Many People?<br>p 34-36            | Eggs and Amoebas p.36<br>POW King Arthur p.94-95 due Oct. 18  |
| Oct 7 The Rescue p.37<br>On A Tangent p. 38-39                                | Doctor's Orders p. 40                                         |
| Oct 14 Exponential Slopes p. 41<br>Logarithm Review p.41-42                   | The Derivative of $x^2$ p.42                                  |
| Oct 18 Find that Base! P.43<br>Logarithm Review p.44                          | Natural Logarithms p.45                                       |
| Oct 21 Generalized Exponential Slopes<br>p.46<br>California and Exponentsp.47 | Instantaneous Rate of Change p.48<br>Unit Portfolio due Nov 1 |
| Oct 25 Return to Small World<br>Isn't It p.49<br>and Review Unit              |                                                               |
| Oct 28 Test                                                                   |                                                               |

|                                                                                                                                              |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Nov 1 Pollster's Dilemma; Sampling Seniors p.52-53                                                                                           | Pizza Combinations p.54<br>Throw Back the Little Ones p.55<br>POW A Hat of a Different Color p. 114-115 due Nov 8 |
| Nov 4 Ice Cream Combinations and Permutations; p.54-55<br>Probability p.59<br>Play Ball p. 60                                                | Combinations and Permutations in Sports p.58<br>Probability p. 61                                                 |
| Nov 8 The Theory of Three-Person Polls p. 62-63<br>The Central Limit Theorem and Graphing Distributions; Normal Area p. 66-72                | Graphs of the Theory p. 64<br>Middletown Musings p.73                                                             |
| Nov 15<br>A Plus for the Community p.74<br>Mean and Standard Distribution for Probability Distribution p.75-76<br>The Search in On! p. 77-78 | POW Analyzing Your Own Poll due Nov 29<br>Putting Your Formulas to Work Part II p.80                              |
| Nov 18 From Numbers to Proportion p.81<br>Different p, different $\sigma$ p.82<br>The Worst Cast Scenario p. 85                              | Is Twice As Many Twice As Good? P.84                                                                              |
| Nov 22<br>What Does It Mean? P.85                                                                                                            | Pollster's Dilemma Revisited p.88                                                                                 |
| Nov 29<br>Review for test                                                                                                                    | Portfolio due Dec 6                                                                                               |
| Dec 2 Test                                                                                                                                   |                                                                                                                   |
| Dec 6 Review for final                                                                                                                       |                                                                                                                   |