MA1021 “Calculus 1” A Term 2004 Syllabus

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Class meetings: 1-1:50 MTRF, Stratton Hall 202
Office hours: 11-12 MTRF or by appointment

TA: Yaokang York Li, yaokang@wpi.edu
Conference: 9-9:50 F, Stratton Hall 106

Maple Lab: 9-9:50 W, Stratton Hall 306

Text: “Calculus” (8th ed.) by Varberg, Purcell, Rigdon

The course content is prescribed by the Department of Mathematical Sciences. Please see the website http://www.math.wpi.edu/
Prerequisites for this course is standard pre -calculus material: real numbers, inequalities, absolute values, quadratic equations, rectangular coordinate system, line equations. Trigonometric functions will be briefly reviewed.

Course objectives: This course is aimed at introducing limits and derivatives. An important part will be devoted to learning techniques for the computation of limits and derivatives. The computations will be either carried out by hand, or computer based using Maple. Students are expected to become familiar with both aspects. Another feature of this course is to stress the importance of Calculus in Science. We will show how derivatives are related to growth rates, velocity, acceleration ... We will also solve optimization problems to find minimum volumes or areas that are solutions to practical problems and we will look at problems related to minimizing costs and maximizing profits. Finally, some fundamental concepts will be rigorously introduced, such as the mathematical definition of limits. We will explain how these theoretical concepts relate to intuitive ideas.

TERM SCHEDULE
Here is a rough outline of what we will cover in the 28 lecture periods:
August 26-27 Preliminary topics
August 30-Sept. 7 Limits, continuity
Sept. 9 -13 Introduction to derivatives
Sept. 14 Test I
Sept. 16 Derivatives of trig. functions
Sept. 17-20 Chain rule, Leibniz notation
Sept. 21 Higher order derivatives
Sept. 23-27 Implicit differentiation, rates, differentials
Sept. 28-Oct1 Extrema, concavity, local extrema
Oct. 4 Test II
Oct. 5-8 Max-Min problems, mean value theorem
Oct. 11 Time permitting, sophisticated graphing
Oct. 12 Review session
Oct. 13 Final: note special time and venue indicated below

GRADES

A: 100 % – 90 %; B: 90 % – 80 %; C: 80 % – 60 %

GRADING SCHEME

Homework : 20 %
MAPLE Laboratories : 15 %
Test I : 20 %
Test II : 20 %
Final : 25 %

If a student happens to miss a test for valid reasons (e.g., as evidenced by a doctor’s note specifically stating that the student was too ill to participate), then the weight of the remaining tests will be increased to compensate for the missing mark.

If a student misses the final test for no documented reason then the NR grade will be given. No late assignments or labs will be accepted for credit.

Homework problems
I will post homework assignments on:
http://users.wpi.edu/~darko/TEACHING/frontpage.html
All students must hand in their own solutions. Solutions must be hand written except for problems that require computer aided graphing or calculations.
Here is the grading scheme for a homework problem worth 5 points:
5 very well done
4 reasonable, possible minor difficulty
3 some difficulty
2 major trouble but student gave it a try
0 no real effort or nothing beyond copying the question
CONFERENCE MEETINGS
The graduate TA will collect homework and grade selected problems. He will also review essential facts and formulas. He will then spend time on discussing homework problems on demand or organize workshop sessions. Note that the first conference will meet on Sept. 3.

M.A.S.H.: Math and Science Help
Tutoring is offered to Calculus 1 students through MASH sessions. More information is available on http://www.wpi.edu/+MASH

MAPLE LABS
Computer algebra systems have, in recent years, had tremendous impact on the teaching of calculus and on its use in industry. While a computer cannot construct a mathematical model of a real-world situation, cannot interpret numerical results, and does not always give correct answers to our questions, it can save us a great deal of time by quickly and accurately performing the more routine tasks involved in doing calculus. Therefore it is crucial that we learn about the capabilities and limitations of computers at the same time that we learn calculus. The department has excellent lab facilities and talented Instructor’s Associates (“IA’s”) to guide each student through the MAPLE computer algebra system and its application to problems from integral calculus. Throughout your time at WPI, other faculty will expect you to be comfortable with MAPLE and it is often a valuable tool to project teams in many disciplines.

Instructors’ Associates:
Jane Bouchard bouchard@wpi.edu, Dina Solitro dsolitro@wpi.edu
Their office is in SH305A.

For its lab sessions, our class will meet in Stratton Hall Room 306, from 9.00 to 9.50. We have already designed lab worksheets for these six sessions. Students will hand in reports at the end of lab sessions. Here are the meeting times for MAPLE labs:

- September 1  Maple introduction
- September 8  Assigning labels, expressions and functions
- September 15 Solving equations with Maple
- September 22 Differentiation with Maple
- September 29 Implicit differentiation
- October 6  First and Second Derivative Tests

TESTS
In-class tests will be conducted on the following dates: September 14, October 4. These will be closed-book closed-notes exams. No calculators are permitted on tests.

Final Exam
There is a common final exam for all sections of MA 1021. This final exam including the Basic Skills Exam discussed in the hand out, will be held from 7:00 to 9:00 pm on Wednesday, October 13, 2004. The final will not be held in the usual classroom. Because the final is the 28th class meeting, no MA 1021 classes will be held on Thursday, October 14. Note
that calculators and notes are not allowed for the common final.
A sample exam will be handed out to you two weeks into the class. Basic Skills Exam
Please read hand out.

SPECIAL ARRANGEMENTS
If you need course adaptations or accommodations because of a disability, or if you have
medical information to share with me, please make an appointment with me as soon as
possible. My office location and hours are listed at the top of this syllabus. If you have not
already done so, students with disabilities, who believe that they may need accommodations
in this class, are encouraged to contact the Disability Services Office (DSO), as soon as
possible to ensure that such accommodations are implemented in a timely fashion. The
DSO is located in Daniels Hall, (508) 831-5235.

ACADEMIC HONESTY
As future leaders of our society, WPI students will be held to the highest ethical standards.
Hard-working honest students can be assured that I will do my best to preserve the integrity
of their good work by being vigilant and promptly and forcefully prosecuting cases of aca-
demic dishonesty. Each student should be familiar with the university’s Academic Honesty
Policy, to be found at
  http://www.wpi.edu/Pubs/Policies/Honesty/policy.html