Iowa State University                Spring 2016
Math 201 – Introduction to Proofs

Instructor
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Office hours        MWF 12-1, TR 2-3, or by appointment

Public Course Website
http://www.public.iastate.edu/~roettger/201

Lecture
MWF 10-10.50, Carver 0282

Materials
Hammack            Book of Proof, ISBN: 9780989472104

Calculator         A scientific calculator is required for this course. No need for expensive graphing calculators. However, any device with communication capabilities (eg phone calculator) is not allowed on exams.

Grading
Your grade for the course will be determined from a weighted percentage score, composed of
   40% Homework (bi-weekly)
   30% In-class exams (15% each)
   30% Final exam (in week May 2-6)
From the percentage score, letter grades will be computed using the standard scale (+ and − for top and bottom 3% of each range)
A    100%-90%
B    89.9%-80%
C    79.9%-70%
D    69.9%-60%
F    59.9%-0%

Some extra credit questions may appear on exams. I will give you half a homework's worth of extra credit for reporting any mathematical error in the textbook or in anything I put on the web. Also, the last homework will be for extra credit. Otherwise, there will be no extra credit. Scores on exams and quizzes will not be curved, but there may be some curving of the final letter grades. If this happens, it would only be in your favor.
### Homework

Bi-weekly written assignments, handed in for grading on Monday BEFORE class. The assignments and due dates will be announced in class and posted on Blackboard. Late homework (including after class) only accepted for half credit. Your lowest 2 homework scores will be dropped.

### Exams

There will be 3 exams. Exam 1 and 2 will be 50 minutes, in the usual classroom during the usual class time, on Wednesday 2/17 and 4/06. The Final Exam will be in the week May 2-6, as scheduled by the Registrar. If you miss an exam for any valid reason, you MUST contact me in writing beforehand. Otherwise do not expect to get a makeup exam.

### Course description

Logic and techniques of proof including induction. Communicating mathematics. Writing proofs about sets, functions, real numbers, limits, sequences, infinite series and continuous function. For details, see 'Course Objectives'. 3 credits.

### Prerequisites

Grade of C- or better in Math 166 or Math 166H.

### Additional resources

<table>
<thead>
<tr>
<th>Blackboard</th>
<th>For homework, announcements, all scores and grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departmental course page</td>
<td><a href="http://orion.math.iastate.edu/dept/CoursePages/201/">http://orion.math.iastate.edu/dept/CoursePages/201/</a></td>
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</tbody>
</table>

### Classroom policies

We do not take attendance. However, you should be aware that students who attend class regularly score much better on tests and get better grades. You are responsible for reading the relevant section of the script.

Please note that anybody found cheating on an exam may be awarded a score of zero on that exam, or even an F for the entire course depending on circumstances.

The policies below are also in full effect. These policies govern makeup exams, disability accommodations, discrimination/harrassment, religious accommodations, and much more. Feel free to ask me for more details!

| Departmental | [http://www.math.iastate.edu/Faculty/ClassPolicies.html](http://www.math.iastate.edu/Faculty/ClassPolicies.html) |
| Make-up exams | [http://catalog.iastate.edu/academiclife/regulations](http://catalog.iastate.edu/academiclife/regulations) |
Course Objectives / Learning Outcomes

- Elementary Set Theory
- Basics of Logic – OR, NOT, IF-THEN, logical equivalence, quantifiers
- Integers, parity, divisors, GCD, LCM, primes, congruences, binomial coefficients
- Rationals – irrationals
- Functions – domain, codomain, injective, surjective, bijective, composition, inverse
- Cardinality – countable, uncountable sets
- Intervals – open, closed, bounded, unbounded
- Reals – symbol $\infty$, $-\infty$, absolute value, bounded function, supremum, infimum
- Sequences – bounded, convergent, divergent, monotone, subsequence, lim sup, lim inf, cluster point, Cauchy sequence
- Series – partial sums, convergence, divergence, absolute/conditional convergence
- Limits of Functions, Continuity – cluster point of a set, one-sided limits, continuity on a set

For more details, see the departmental course page above.