

Course Syllabus

Transitions in Mathematics (Math 266)

Description:	<i>In this class, students prepare to become professional mathematicians. Major course components are 1) a study of common proof techniques using linear algebra and number theory as foundations, and 2) an introduction to current professional practices such as the use of mathematical typesetting software, the use of computational software, finding and reading mathematical literature, and a survey of current issues in mathematics. Usually offered every spring semester.</i>
Credit Hours:	3
Frequency	Offered every spring semester.
Audience:	Required for mathematics majors. Prerequisite for many 300 and 400 level mathematics classes.
Prerequisites:	MATH 264, or MATH 132 and consent of the department chair.
Format:	3 lectures (50 min) per week
Textbook:	1. How to Think Like a Mathematician by Kevin Houston. (Primary text, Required) ISBN-13: 978-0-521-71978-0 2. A Student's Guide to the Study, Practice, and Tools of Modern Mathematics by Donald Binder and Martin Erickson. (Supplementary resource, Required) ISBN-13: 978-1-4398-4606-3
Software:	Use of LaTeX is required (LaTeX is a free download from http://miktex.org/).
Internet:	Course material and grades are often maintained in Blackboard, at the discretion of the instructor.
Access & Accommodations:	The Access & Accommodations Resource Center (AARC) is the campus office that works with students to provide access and accommodations in cases of diagnosed mental or emotional health issues, attentional or learning disabilities, vision or hearing limitations, chronic diseases, or allergies. You can contact the office at aarc@valpo.edu or 219.464.5206. Students who need, or think they may need, accommodations due to a diagnosis, or who think they have a diagnosis, are invited to contact AARC to arrange a confidential discussion with the AARC office. Further, students who are registered with AARC are required to contact their professor(s) if they wish to exercise the accommodations outlined in their letter from the AARC.
Notice of Cancellation:	In the event class is cancelled, you will be notified through your Valparaiso University e-mail account

Student Learning Objectives:

- A. Students develop fundamental skills in the use of standard professional tools in mathematics.
- B. Students understand, read, and apply commonly used methods of mathematical proof.
- C. Students develop an appreciation for mathematical thinking beyond simple problem solving.
- D. Students prepare for success in more rigorous upper level mathematics courses.

Topics & Performance Requirements Include (but are not limited to):

1. producing mathematical documents using the typesetting software LaTeX
2. understanding mathematical terminology such as *theorem*, *lemma*, and *corollary*
3. understanding distinguishing characteristics of different areas in mathematics, such as analysis, abstract algebra, and combinatorics
4. using truth tables to determine the validity of logical statements
5. identifying hypotheses and conclusions in mathematical theorems
6. identifying when theorems apply, and if not, what part of the hypothesis is violated
7. reading and applying common elements of deductive and inductive reasoning, and constructing elementary proofs using direct, indirect, existence and inductive arguments
8. using on-line search engines and databases to locate items in mathematical literature
9. extracting the main ideas and results of some mathematical literature even if the underlying details are obscure
10. writing and presenting mathematical ideas clearly