

COURSE REVISION

Northwest Indian College Curriculum Committee

COURSE INFORMATION BEFORE PROPOSED CHANGE

Department and Number: MATH 151 Course Title: Survey of Mathematics

Rationale: Currently, students fulfill the prerequisite for Math 151 with any passing grade (D- or better) in Math 099. This means that students can enroll in Math 151 even though they have not necessarily demonstrated satisfactory competency in achieving the course outcomes. This increases the likelihood of students being unprepared to be successful in this class. Additionally, the new NWIC General Education and College Requirements guidelines specify that courses that satisfy the NWIC quantitative skills requirement, including Math 151, will have a prerequisite of Math 99 with a grade of C or better.

PROPOSED REVISIONS TO THE COURSE – FILL IN CHANGES ONLY

Course Title (60 character maximum): _____

Short title if proposed title is over 25 characters: _____

Credits: _____

Course Catalog Description (50 word maximum): _____

Prerequisites, if any: C or better in Math 099 or test above intermediate algebra

Form of Grading: A-F S/U

Course Type: Lecture only Lab only Lecture and lab Phys. Ed. Internship/Practicum

Allow course to be taught in separate modules? Yes No

Indicate number of credits for each module:

A credits B credits C credits D credits E credits F credits

Designed to meet the following general education and related requirements:

(Basic Skills) (Distribution) (Other) (NWIC)
 CS QS HP HT SS NS NSL TE NE NASD

Designed to meet the following program requirements:

NWIC Requirements Program Core Requirements Electives

Name(s) of the program(s) if the course satisfies program core requirements: _____

For the following type(s) of program (check all that apply):

Program of Study: BS AAS AST AAS-T ATA Certificate
Other Program Type: Award of Completion Training Program

Add course to the published NWIC catalog? Yes No

Required attachments: (Templates for required attachments are available on the Curriculum Committee web site.)

Course Outcomes Form Course Syllabus

Matteo Tamburini

Proposed by (type name)

June 1, 2014

Date

APPROVAL SIGNATURES

Dean of Academics and Distance Learning – approved to present

Date

Curriculum Committee Chair – approved by Curriculum Committee

Date

Vice President for Instruction and Student Services – approved to implement

Date



Course Outcomes Form Northwest Indian College

Before completing this form, please refer to the *Instructions for Completing the Course Outcomes Form*. Please submit this form electronically to Shidon Aflatooni at safalatooni@nwic.edu.

Last date this form was updated or edited	June 1, 2014
Course Number (e.g., ENGL 101)	MATH 151
Course Name (e.g., English Composition I)	Survey of Mathematics
List all instructor(s) who participated in creating and approved these course outcomes (please consult with at least one other person)	Matteo Tamburini
List the main textbooks, readings or other resources used in this course (including title, year and publisher)	No textbook is required for this class.

A. **NWIC outcomes:** From the *List of NWIC Outcomes*, select the most important outcomes you assess in this course (at least one NWIC outcome must be chosen).

Institutional outcome	Instructional Activities: How will students master this outcome? (e.g., solving problems, group activity)	Assessment/Evaluation Strategies: How will you measure this outcome? (e.g., student presentations, essays)
Upon degree attainment students will be able to ...		
Use analytical and critical thinking skills to draw and interpret conclusions from multiple perspectives including indigenous theory and methods	Ongoing classroom discussions, individual and group problem solving sessions, reflecting on the feedback from their assignments	Exams, classroom observations, ongoing formative assessments

B. **Course outcomes:** In order of priority, list the most important other learning outcomes for this course that you assess (a maximum of 8).

Other course outcomes: Complete the sentence – As a result of this course, students will be able to...	Instructional Activities: How will students master this outcome? (e.g., solving problems, group activity)	Assessment / Evaluation Strategies: How will you measure this outcome? (e.g., student presentations, essays)
Make mathematical conclusions and interpret them in context	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
Recognize, extend, and generalize patterns	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments

Communicate mathematical ideas effectively, using an appropriate combination of pictures, diagrams, the language of algebra, and standard vocational English	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
Justify/support a conclusion using multiple strands of argument	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
Describe the symmetry group of a 2-dimensional shape	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
Classify objects (including finite shapes, frieze and wallpaper patterns) according to their symmetry group;	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
construct and interpret graphical representations of data, such as histograms, pie charts, boxplots and scatterplots, using a graphing calculator and/or an electronic spreadsheet.	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
Compute or reasonably estimate the mean, median and standard deviation of a dataset using a graphing calculator and/or an electronic spreadsheet, and interpret them; compare and contrast the properties of various measures of center and spread.	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
Explain the importance of measures of spread (distribution histograms, standard deviation) along with measures of center.	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments
Describe and apply the concept of a base as it applies to the counting systems in various languages, as well as artificial ones (such as base 2, 16)	Reading the textbook, asking questions during lecture, completing assignments, reflecting on feedback on assignments	Exams, classroom observations, ongoing formative assessments

C. Please list the NWIC outcomes and course outcomes from above on your syllabus.

D. Please assess the NWIC outcomes and course outcomes, which are listed above, in your classes.

MATH 151 – SURVEY OF MATHEMATICS (5 CR): Spring 2013

Class Time and Location: Monday through Friday, 3:30 – 4:20, DL-2.

Instructor Information:

Matteo Tamburini

Office: Building 4, Room 205

Office Hours: T : 10:30 – 12, 4:30 – 6; W: 4:30 – 6pm and R: 10:30 – 12

Phone: (360) 392 4348; **Math and Writing Center:** (360) 392 4235

Fax: (360) 647 7084

Email: mtamburini@nwic.edu

Course Description: Integrated concept-based mathematics course that promotes quantitative literacy. College algebra concepts are taught contextually as the language and symbolism of mathematics. Real systems are modeled to develop topics chosen from logic, sets, counting methods, problem solving, statistics, and probability. Experiential activities consolidate core concepts within a collaborative learning environment.

Prerequisite: C or better in Math 099 or test above intermediate algebra.

Textbook: No textbook is required for this class.

Attendance: Your presence in this class will be crucial to your success. You will be expected to be in class every day. I understand that life may bring unexpected complications, but understanding math involves participation and time, both in and out of class. If you must miss class for any reason (personal, health-related, or cultural) you will be expected to contact me ahead of time and stay current on class assignments.

Student Email: All students receive an <nwic.edu> email account upon enrollment. All official notifications about your bookstore voucher code, Moodle, financial aid, scholarship and internship opportunities, etc. are done through your <nwic.edu> email account. You can access your <nwic.edu> email account from any browser by going to the www.nwic.edu website and clicking “email login.” If you have questions, you can contact Daryl Floyd at (360) 392 4311. His office is in building 10.

Course Policies:

- You will not need to purchase a graphing calculator, though you may choose to use one if you want.
- You will be expected to turn in your portfolio items on time, even if they are incomplete. You will be allowed to continue to work on and revise portfolio items provided that you meet the deadline.
- We will spend class time discussing important concepts. However, our time is limited. After the deadlines listed on the calendar, we will NOT devote more class time to the topic. If you are not prepared to demonstrate your understanding of the material, you will have the option to continue working on it in the Math and Writing Center.

Course Requirements, Assignment and Assessments:

- By the end of the quarter, you will have a completed Portfolio which will include your menu tasks, your quizzes and other items.
- You will have the option of completing an optional project and writing assignment.
- Homework will be assigned and collected on a regular basis. You will be assessed on the thoughtfulness of your work as well as the completion of the assignment.
- There will be occasional quizzes, and a comprehensive final exam.

Course Outcomes:

As a part of the expectations for this class, by the end of the quarter you should be able to:

- Make mathematical conclusions and interpret them in context
- Recognize, extend, and generalize patterns
- Communicate mathematical ideas effectively, using an appropriate combination of pictures, diagrams, the language of algebra, and standard vocational English
- Justify/support a conclusion using multiple strands of argument
 - Describe the symmetry group of a 2-dimensional shape;
 - Classify objects (including finite shapes, frieze and wallpaper patterns) according to their symmetry group;
 - construct and interpret graphical representations of data, such as histograms, pie charts, boxplots and scatterplots, using a graphing calculator and/or an electronic spreadsheet.
 - Compute or reasonably estimate the mean, median and standard deviation of a dataset using a graphing calculator and/or an electronic spreadsheet, and interpret them; compare and contrast the properties of various measures of center and spread.
 - Explain the importance of measures of spread (distribution histograms, standard deviation) along with measures of center.
 - Describe and apply the concept of a base as it applies to the counting systems in various languages, as well as artificial ones (such as base 2, 16)

Grading:

In order to pass this class, you must demonstrate that you understand the material covered in the class: this means that you should be able to do the things listed above.

You will have multiple opportunities to demonstrate your understanding: through exams, homework, in-class activities, and by completing optional assignments.

For each of the outcomes in the list above, I will measure your understanding using the words below:

Accomplished	Developing	Beginning	Incomplete
You demonstrate a thorough understanding of the concept in a variety of contexts.	You consistently demonstrate an understanding of the fundamental aspects of the concept.	On at least one occasion you demonstrate that you understand <u>some</u> of the important features of the concept	There is insufficient evidence to assess your understanding of the course outcome.

A “C” grade in this class means

That you demonstrate at least a **Developing** understanding of **each** of the course outcomes;

and that you attend class at least 70% of the time.

A “B” grade in this class means that you have fulfilled the requirements for a “C” grade and:

- | | | |
|---|----|--|
| <ul style="list-style-type: none"> • Demonstrate an Accomplished understanding of more than half of the course outcomes | OR | <ul style="list-style-type: none"> • An Accomplished understanding of at least two course outcomes; AND any of the following: <ul style="list-style-type: none"> • Consistently turn in thoughtfully completed assignments (homework, a complete portfolio, etc.) • One pattern completed at the accomplished level • Complete one of the optional writing assignments |
|---|----|--|

An “A” grade in this class means that you have fulfilled the requirements for a “C” grade and:

- Demonstrate an **Accomplished** understanding of more than half of the course outcomes
- Consistently turn in thoughtfully completed assignments (homework, a complete portfolio)
- Turn in TWO menu tasks that are completed at the accomplished level
- Complete one of the optional projects/writing assignments

The following chart is what I will use to keep track of your progress and understanding. Next to each learning goal you can demonstrate that you are either Incomplete, Beginning, Developing, or Accomplished. Passing this class with a **C** requires you to be **Developing** in each category at the end of the quarter.

NAME _____	WK 2	WK 4	WK 6	WK 8	WK 10
Make mathematical conclusions					
Generalize patterns					
Communicate effectively					
Justify/support a conclusion					
Describe the symmetry group					
Classify objects by symmetry group;					
Graphical representations of data					
make a histogram					
interpret a histogram					
Compute or reasonably estimate					
mean					
median					
standard deviation					
importance of measures of spread					
Numbering base					

Optional Writing Assignment

You have an option of completing a project with an attached 5-page writing assignment:

1) **Service-Learning:** Starting in week 6, you could choose to go to a section of Math 98 or Math 99 twice a week to work with the students in that class according to the standards that we will discuss in class. Then you could write a paper that answers the following questions:

Think about three times when you saw a student really learning something.

What did the student learn?

How did they learn it?

How did you know that the student learned it?

In what way did you contribute to that student's learning?

Did this experience teach you anything about your own learning?

2) **Books for children:** You could look through a collection of at least 20 children's books and answer the following questions for each book:

What is the title and who is the author of the book?

For what age group is the book intended?

Identify the mathematical concepts that appear in those books

Does the book encourage children to extend or generalize patterns?

In the book, what does it mean to "do math"? **Who** is "doing math?"

3) **Math autobiography:** Write about (at least) two specific experiences in mathematics your educational career as a student that had an impact on how well you learned math, and how you perceive mathematics. What were the specific topics, lessons and teachers? (you do not need to identify anyone by name) What was the impact of each experience?

Tentative Schedule (subject to change):

	Mon	Tues	Wed	Thu	Fri
Apr	1 Introductions	2 Area/Perimeter (& volume?)	3 Pascal's triangle	4 Trains in two colors	5 Data collection
	8 MENU 1 starts	9	10	11	12
	15	16	17	18	19 MENU 1 DUE
	22 MENU 2 starts	23	24	25	26
	29	30	1	2	3 MENU 2 DUE
May	6 Share something that you learned really well with the class/ others look for evidence	7 Play Blokus	8 Sort the pieces in various ways: symmetry, vocabulary (reflection, rotation)	9 hexominoes/triangle blokus	10 NO CLASS
	13 Various frieze patterns: sort and catalog	14	15 Wallpaper groups	16	17 "Quiz"
	20 Computer Lab	21 Computer Lab	22 Computer lab	23 Computer lab	24 NO CLASS
	27 NWIC CLOSED	28	29	30	31
Jun	3	4	5	6	7

	Pseudo-Yup'ik numbers/ base 5	Pseudo-Yup'ik numbers/ base 5	finger numbers/ base 12	finger numbers/ base 13	in-class assignment
	10	11	12 FINAL EXAM	13	14 NO CLASS

Partial list of assignments:

Due Date	Topic	Assignment
Week 1	Tue	Writing <ul style="list-style-type: none"> Describe one thing that you understand really well. How did you get to understand it so well? How do you know that you understand it? Are there any lessons that you could learn from your experience learning this that you could apply to the learning of math?
	Wed	Writing Respond to brain article
	Thu	Writing Respond to children and mathematics article pages 7-9 YC&M
	Fri	Writing Respond to teaching math to children article (AMST)
Week 2	Tue	“What I see” “What I see table” for someone else’s way of seeing
	Wed	
	Thu	
	Fri	MENU 1 Complete Fork Pattern so we can process it
Week 3	Tue	
	Wed	
	Thu	
	Fri	MENU 1 Complete tasks in Menu 1
Week 4	Tue	
	Wed	
	Thu	
	Fri	MENU 2 Complete so we can process it
Week 5	Tue	
	Wed	
	Thu	MENU 2 Complete tasks in Menu 2
	Fri	Reflection Writing assignment: <ul style="list-style-type: none"> Describe one thing that you have learned this quarter in this class that you understand really well. How did you get to understand it so well? How do you know that you understand it?
Week 6	Tue	Symmetry Draw all the area-5 Blokus pieces on graph paper. Sort them in three different ways.
	Wed	Symmetry For each category that we arrived at in class, draw another shape that has the same symmetry.
	Thu	
	Fri	
Week 7	Tue	
	Wed	
	Thu	
	Fri	Symmetry Complete Quiz on symmetry groups

Week 8	Mon	Writing Assignment	Turn in first draft of optional writing assignment (for a grade of B or better)
Week 9	Thu	Numbering systems	For your own language, can you write down the numbers from one to 100?
	Fri		Complete Quiz on data collection
Week 10	Mon	Writing Assignment	Turn in second draft of optional writing assignment (for a grade of B or better)
	Tue		
	Wed		
	Thu		
	Fri		Complete quiz on numbering systems