Syllabus for Math 120E Fundamentals of College Math (Expanded) and Math 96A Intermediate Algebra—Basic Properties

Instructor:
Contact Information:

Textbook: Fundamentals of College Mathematics: Custom Edition for UNR.

Pearson MyLab & Mastering: All students must sign up for Pearson's MyMathLab. The majority of the homework will be done online and real time access to the grade book is available as well. Online Access Codes for MyMathLab are available at the ASUN bookstore as well as online at http://www.pearsonmylabandmastering.com A hard copy of the book is optional. All students will have access to an online version of the textbook through MyMathLab. The course id required to sign up on MyMathLab is XXXXXX.

Calculator: A scientific or graphing calculator is required.

Catalog Description of Math 120E: Covers the same material as Math 120 and requires concurrent enrollment in a specific section of Math 96A. Students who enroll in Math 120E will be added to the correct section of Math 96A by Admissions & Records staff within 2 working days. This course satisfies the university core mathematics requirement.

(Catalog Description of Math 120: Sets, logic; probability, statistics; consumer mathematics; variation; geometry and trigonometry for measurement; linear, quadratic, exponential and logarithmic functions. Emphasis on problem solving and applications. This course satisfies the university core mathematics requirement.)

Prerequisite: ACT score of 19 or SAT score of 470 or MATH 95 with a "C" or above or an S or Accuplacer Elementary Algebra 76.

Student Learning Outcomes: Upon completion of this course, students will be able to:

-formulate and use mathematical models to analyze real-world situations.
-determine and implement an appropriate method of solution for financial problems.
-solve basic probability problems.

Homework: All homework is to be completed with MyMathLab. All students must register for this course by going to the webpage http://www.coursecompass.com/ and following the instructions. You will need a valid email address, course id, and student access code (should come with textbook) to register.

Tests: There will be six multiple choice tests. Please bring your Student ID to each test.

Final Exam: There will be a comprehensive multiple choice final.

Math 120E Grade Breakdown/Scale:

Homework	20
Quizzes	10
Test	48
Final	22

Grade	Min. % Required
A	90%
B	80%
C	70%
D	60%
F	<60%

Grade Scale (for Math 96A grade):

Grade	Min. % Required
S	70%
U	<70%

Math 96A grade will be based on homework, quizzes and tests on the Intermediate Algebra content in this class.

Schedule of topics to be covered (topics in square brackets indicate Math 96A topics)

Week 1
- Syllabus and Course Info
- [1.1 The real numbers, the real number line, absolute value]
- [1.2 Working with polynomials]
- Quiz and discussion of homework problems

Week 2
- [1.3 Factoring polynomials]
- [1.4 Working with rational functions]
- [1.5 Exponents and radicals]
- Quiz and discussion of homework problems

Week 3
- [1.6 Solving first degree equations and equations with rational expressions]
- [1.7 Solving quadratic equations with factoring or the quadratic formula]
- Review
- Test 1

Week 4
- [2.1 Graphs of functions]
- [2.2 Equations of lines; slope-intercept form]
- [2.2 Equations of lines; point-slope form]
- Quiz and discussion of homework problems

Week 5
- **Holiday**
- 2.3 Applications of linear models
- Review
- Test 2

Week 6
- 3.1 Functions, functional notation,
- 4.1 Exponential functions and their properties; exponential growth and decay
- 4.2 Applications of exponential models in business, finance, and health
- Quiz and discussion of homework problems

Week 7

- 4.3 Logartihmic functions and their properties
- 4.4 Applications of logarithms and using logarithms to solve exponential equations
- Review
- Test 3

Week 8

- 5.1 Simple interest, present value, and future value
- 5.2 Compound interest
- 5.3 Annuities for accumulating funds and their future values
- Quiz and discussion of homework problems

Week 9

- 5.4 Payout annuities and their present value
- 5.4 Amortization
- Review
- Test 4

Week 10

- 7.1 Sets, subsets and set builder notation
- 7.2 Venn diagrams and their applications
- 7.3 Introduction to probability
- Quiz and discussion of homework problems

Week 11

- 7.4 The union rule and complement rule in probability; odds
- Review
- Review
- Test 5

Week 12

- 8.1 Factorials; permutations; P(n,r)
- 8.2 Combinations; C(n,r)
- 8.3 Applications of counting principles in probability
- Quiz and discussion of homework problems

Week 13

- 8.3 Applications of counting principles in probability, continued
- 8.5 Random variables, probability distributions, expected value
- Review
- Test 6

Week 14

- 9.1 Frequency distributions, measures of central tendency
- 9.2 Measures of variation
- 9.3 Normal distributions
- Quiz and discussion of homework problems

Week 15

- Review
- Review
- PREP DAY
- Final Exam

Introduction

This document is meant to provide some background about corequisite model mathematics courses and how they are actually implemented at the University of Nevada, Reno. In particular, for faculty from other institutions, this should provide additional information for those unfamiliar with this particular university's placement, general education mathematics/quantitative reasoning requirements, enrollment and grading processes, information that would be of interest to anyone considering implementing a similar curriculum, beyond the information in the expanded syllabi.

Traditional Curricula

The University of Nevada, Reno (UNR) as traditionally offered two remedial courses, Elementary Algebra (Math 95) and Intermediate Algebra (Math 96), to prepare the weaker students admitted to the university for college level mathematics courses. The prerequisites are the following

Ways to Qualify:	**Starting Course**
Admission to the university	Math 95 Elementary Algebra[1]
ACT MATH 19-21, SAT MATH[2] 470-490, or completion of Math 95	Math 96 Intermediate Algebra[3]
ACT MATH >21, SAT MATH[2] >490, or completion of Math 96	Math 126 Precalculus I[4]
ACT MATH >21, SAT MATH[2] >490, or completion of Math 96	Math 120 Fundamentals of College Math[5]

Table 1. Traditional curricula and prerequisites at UNR.

Notes:

[1]The content of Elementary Algebra is closely aligned with high school Algebra I.

[2]In this table, we are referring to the SAT before the rescaling of SAT scores that took place in Spring 2016.

[3]The content of Intermediate Algebra is closely aligned with high school Algebra II.

[4]UNR's Math 126 Precalculus I covers college algebra, or the algebraic portion of precalculus. It prepares students for either Business Calculus (which does not involve trigonometric functions) or Math 127 Precalculus II, which covers the trigonometric functions, identities, and other related topics to prepare students for the Calculus for Scientists and Engineers sequence.

[5]UNR and the other Nevada System of Higher Education institutions are somewhat unusual in that freshmen in non-calculus based disciplines do not have a pure introductory statistics course option to meet the general education mathematics/quantitative reasoning requirement. Instead, these students have just one alternative to Fundamentals of College Mathematics, the focus of which is about 50% statistics and probability and 50% mathematics (a combination of elementary modeling such as linear and exponential models and some topics in financial mathematics). Our introductory statistics courses have a Precalculus I prerequisite.

Corequisite Model Alternatives to the Traditional Curricula

UNR recently began offering two new versions of the two gateway math courses which included corequisites covering some portion of the remedial material in Math 96.

Roughly speaking, we determined that only a third of Intermediate Algebra was relevant background for the mathematical modeling we teach in Fundamentals of College Math, so we combined a 1-credit remedial course, Math 96A covering this content.

With the corequisite version of Precalculus I, we initially designed this so that students who placed "somewhat close to the ACT 22 cutoff" could receive extra support, in the form of the other 2/3 of Intermediate Algebra, along with the 3-credit Math 126 Precalculus I content. This was initially designed this way in part so we could have students transfer from the liberal arts track to the calculus-bound track, and pick up the remaining reinforcement of Intermediate Algebra concepts in the latter corequisite course with no unnecessary repetition of remedial content.

In hindsight, once both of these courses have been offered at scale, the pathway to transition between the two tracks seems to not be very important. With the full force of academic advising about the courses, very few students seem to transition in that direction (or, perhaps, the ones considering such a transition sign up for 126E+96D from the beginning since it will count toward either type of major's Core Math requirement).

Ways to Qualify:	**Starting Course**
Admission to the university	Math 95 Elementary Algebra
ACT MATH 19-21, SAT MATH[2] 470-490, or completion of Math 95	Math 96A+Math 120E Corequisite Model Fundamentals of College Math
ACT MATH 19, SAT MATH[2] 470 or completion of Math 95	Math 96 Intermediate Algebra
ACT MATH 20-21, SAT MATH[2] 480-490	Math 96D + 126E Corequisite Model Precalculus I
ACT MATH >21, SAT MATH[2] >490 or completion of Math 96	Math 126 Precalculus I or Math 120 Fundamentals of College Math

Table 2. Modified curricula and prerequisites at UNR, with accelerated pathways through corequisite model courses.

Course Structure of Corequisite Combinations
In the catalog, and on a student's transcript, each of Math 120E and Math 126E carry three baccalaureate credits, just like their non-corequisite analogs. The respective corequisites of Math 96A and Math 96D carry one credit and two remedial credits, meaning these credits count toward the student's load but do not count toward a baccalaureate degree.

In the schedule, the Math 120E and Math 126E courses show meeting times of 4 hours per week and 5 hours per week, respectively, and the corequisite sections do not show any meeting times. This way, students sign up for a particular section of Math 120E and they have a fixed block of time for the entire Math 120E +Math 96A combination, when they will meet with the same instructor and the same cohort of classmates. In other words, the class functions like a 4-credit class, in terms of their schedule. Similarly, a student signing up for Math 126E selects a 5 hour per week time slot, which allows the instructor and the same cohort of classmates to meet for the entire Math 126E+96D combination, as if it were one 5 credit course.

Due to the fact that each corequisite model combination functions, for all intents and purposes, as a single class with the same instructor for the entire block instead of two classes with separate weekly meetings for Math 120E and Math 96A, or separate meetings for Math 126E and Math 96D, it is not necessary to spend the same amount of time on remedial material each week. Rather, it is possible to provide some motivation from the credit bearing material, delve into a review of relevant remedial material, then move into credit bearing material, in whatever order seems most pedagogically effective.

Enrollment Details
With our PeopleSoft student record system, we were not able to have one section of Math 96A which functioned as a corequisite for all the different sections of Math 120E. Hence, there had to be matching sections numbers of the two classes. This complicates the enrollment process, and we found it most efficient to have someone in Admissions and Records add each student who enrolls in a particular Math 120E section to the corresponding Math 96A section (so that the instructor can assign grades to the student in both parts). Therefore, the catalog description of Math 120E states that students who enroll will automatically be added to the corresponding section of Math 96A, and similarly for Math 126E and Math 96D.

Grading Details
A student enrolled in a corequisite model combination receives a grade in each part (S/U for the remedial part). The most important role of the grade in the remedial portion is that is gives the student the semester load credit for the extra time required, to qualify for full time status or financial aid. In the relatively rare case that student needs to take the credit bearing course again, a passing grade in the remedial piece meets the prerequisite so the student could simply retake the regular 3-credit credit bearing class the second time, without repeating the remedial corequisite.