MATH 370E: ARITHMETIC OF RATIONAL NUMBERS-MODULE 1

Originator
mflora

Justification / Rationale
Add modalities, clarify course content, update textbook

Effective Term
Fall 2022

Credit Status
Noncredit

Subject
MATH - Mathematics

Course Number
370E

Full Course Title
Arithmetic of Rational Numbers-Module 1

Short Title
RATIONAL NUMBERS I

Discipline

Disciplines List
Mathematics

Modality
Face-to-Face
100% Online
Hybrid

Catalog Description
This is a course in basic arithmetic of rational numbers. Topics include the definitions of rational numbers and proper and improper fractions; multiplying and dividing rational numbers; simplifying rational numbers using prime factorization; writing equivalent fractions with different denominators; and applying rational numbers to real life situations. Additional emphasis includes natural number exponents with rational number bases.

Schedule Description
This course will focus on multiplying and dividing of rational numbers with applications to real life situations. Advisory: MATH 370B, MATH 370C & MATH 370D

Non-credit Hours
18

Lecture Units
0

Lab Units
0

In-class Hours
18

Out-of-class Hours
0

Total Course Units
0
Total Semester Hours
18

Override Description
Noncredit

Prerequisite Course(s)
Advisory: MATH 370B, MATH 370C & MATH 370D

Required Text and Other Instructional Materials

Resource Type
Book
Open Educational Resource
Yes

Author
David Arnold, Department of Math, College of the Redwoods

Title
Prealgebra Textbook

Edition
2

Publisher
College of the Redwoods

Year
2013

College Level
No

Flesch-Kincaid Level
7.7

ISBN #
https://www.redwoods.edu/Portals/121/PreAlgText/Prealgebra.pdf?ver=2016-02-09-153714-077

Resource Type
Book
Open Educational Resource
No

Author
Martin-Gay

Title
Basic College Mathematics with Early Integers

Edition
4

Publisher
Pearson

Year
2019

College Level
No

ISBN #
9780135176931 (book only)

Resource Type
Web/Other
Open Educational Resource
No

Year
n/a

Description
Pearson MyLab and Mastering may be used with the Martin-Gay textbook

---

Resource Type
Book
Open Educational Resource
Yes

Author
Lynn Maracek, MaryAnne Anthony-Smith, Andrea Honeycutt Mathis

Title
Prealgebra

Edition
2

City
Houston

Publisher
OpenStax

Year
2020

College Level
No

Flesch-Kincaid Level
5.4

ISBN #
978-0-9986257-9-9 (hardcover)

Resource Type
Web/Other
Open Educational Resource
No

Year
n/a

Description
WebAssign may be used with the OpenStax textbook

Resource Type
Web/Other
Open Educational Resource
Yes

Year
n/a

Description
MyOpenMath may be used with any textbook.

For Text greater than five years old, list rationale:
The College of the Redwoods textbook is older than 5 years, but it should work fine since the content should not have changed since then. Since it's an open resource, if there are mistakes that the professor comes across while using it, those can be corrected easily.

Class Size Maximum
40

Entrance Skills
Find the prime factorizations of positive integers.

Requisite Course Objectives
MATH 370B-Identify divisors of whole numbers.
MATH 370B-Find the prime factorizations of whole numbers.

Entrance Skills
Calculate sums, differences, products, quotients, and powers of signed integers.

Requisite Course Objectives
MATH 370C-Compute using addition and subtraction on the integers.
MATH 370D-Calculate products of integers.
MATH 370D-Calculate quotients and remainders of integers.
MATH 370D-Evaluate integers expressions containing natural number exponents of integer bases.

Entrance Skills
Use addition, subtraction, multiplication, and division of integers to solve application problems.

Requisite Course Objectives
MATH 370B-Apply the basic operations to solve application problems including those involving area and volume of basic geometric shapes.
MATH 370C-Compute the distance between two integers using absolute value.
MATH 370C-Use addition and subtraction to solve application problems involving integers.
MATH 370D-Use integer multiplication and division to solve application problems, including those involving area and volume of basic geometric shapes.

Course Content
1. Review
   a. Integer facts
   b. Addition, subtraction, multiplication, exponentiation, and division of integers

c. Prime Factorization
d. Real number lines

2. Rational numbers
   a. Definition of rational numbers and models of fractions
   b. Proper and improper fractions
   c. Simplifying fractions using the Fundamental Property of Fractions
   d. Equivalent fractions & comparing fractions
   e. Using prime factorization to simplify fractions
   f. Plotting rational numbers on the real number line
3. Operations on Rational Numbers
   a. Multiplying rational numbers
   b. Natural number exponents of rational numbers
   c. Dividing rational numbers
   d. Order of operations
   e. Applications

Course Objectives

	Objectives
Objective 1	Define and model rational numbers, proper fractions, and improper fractions.
Objective 2	Comprehend the concept of a fraction as a part of a whole.
Objective 3	Apply the Fundamental Property of Fractions to write equivalent fractions with different denominators.
Objective 4	Apply prime factorization to simplify rational numbers.
Objective 5	Compare rational numbers.
Objective 6	Calculate products and natural number powers of fractions.
Objective 7	Calculate quotients of fractions.
Objective 8	Apply the order of operations to simplify expressions involving products, powers, and quotients of rational numbers written in fraction form.
Objective 9	Use multiplication and division of rational numbers to solve application problems.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Convert fractions to various equivalent forms by means of the Fundamental Property of Fractions and prime factorization.
Outcome 2	Use multiplication and division of rational numbers written in fraction form to solve application problems and evaluate the reasonableness of the results.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Technology-based instruction	Students will complete problem sets and receive feedback (automated and/ or from professor) on assignments.
Laboratory	Students will participate in individual and group exploration of course topics. Professor, ISA(s), and students will discuss and explore course topics.
Demonstration, Repetition/Practice	Students will be given additional problem sets to complete on their own to improve skills.
Tutorial	Students will read, watch, and/or listen to material presented and explained through various media.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Computational/problem-solving evaluations	Students will solve problems that involve whole numbers and operations on whole numbers. They will receive feedback on their answers and explanations from the professor. The out of class portions of these problem sets should require about 16 hours of work over the course.	In and Out of Class
Self-paced testing	Students may take short quizzes for grade and/or for credit and/or self-evaluation purposes. Out of class self-paced testing should be elective and used for the purposes of studying.	In and Out of Class
Mid-term and final evaluations	Unit tests and a final examination will consist of questions about course concepts and problems requiring students to perform operations on whole numbers. These examinations may have take-home components.	In and Out of Class

Assignments

Other In-class Assignments

1. Students will take notes on lectures, videos, and/or reading.
2. Students will participate in classroom activities that serve to review, analyze, and evaluate skills with whole numbers.

Other Out-of-class Assignments

1. Students will read textbooks, read online material, watch videos, and/or participate in technology-based tutorials.
2. Students may be asked to summarize assignments and activities.

Grade Methods

Pass/No Pass Only

Distance Education Checklist

Include the percentage of online and on-campus instruction you anticipate.

Online %

100

On-campus %

0

What will you be doing in the face-to-face sections of your course that necessitates a hybrid delivery vs a fully online delivery?

Although the course can be offered entirely online, it may also be offered hybrid to take advantage of collaboration activities that are more suited to in-person interaction.
Examinations can be given in a controlled location.

Lab Courses

How will the lab component of your course be differentiated from the lecture component of the course?

Lab activities and discussions will involve more active learning than lecture activities.

From the COR list, what activities are specified as lab, and how will those be monitored by the instructor?

Lab activities may include group-work, problem sets, exploration-based learning, and/or discussions. Discussions and other work completed in Canvas are monitored and evaluated by the professor. Work that does not take place in Canvas are evaluated by the professor based on write-ups (which may include summaries and feedback from the participants). Anonymous and non-anonymous feedback opportunities will be available to students to allow the professor further monitor effectiveness and appropriateness of activities that take place somewhere other than on the course LMS.

How will you assess the online delivery of lab activities?

Reports and other forms of write-ups will be submitted on the course LMS for evaluation and feedback.

Instructional Materials and Resources

If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?

Depending on the textbook used, the professor may choose to use Pearson MyLab and Mastering, WebAssign, or MyOpenMath. All of these are considered to be safe for use in education for both faculty and students. All can also be integrated with the college LMS (Canvas), which decreases the amount of times students will need to sign-in-and-out of accounts and open them up to data breaches.

If used, explain how specific materials and resources outside the LMS will be used to enhance student learning.

Professors who choose to use Pearson MyLab and Mastering, WebAssign, or MyOpenMath do so in order to assign pre-written or instructor- created problems that are more complicated than those that can be created in Canvas while still receiving instantaneous feedback.

Effective Student/Faculty Contact

Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?

Within Course Management System:

Discussion forums with substantive instructor participation
Online quizzes and examinations
Private messages
Regular virtual office hours
Timely feedback and return of student work as specified in the syllabus
Weekly announcements

External to Course Management System:

Direct e-mail
Posted audio/video (including YouTube, 3cmediasolutions, etc.)
Synchronous audio/video
Telephone contact/voicemail

For hybrid courses:

Scheduled Face-to-Face group or individual meetings

Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.

Faculty will regularly contact students individually and as a group through Canvas messages and/or COD email. Students will also receive regular announcements with information about the course, COD as a whole, or other relevant information. In discussions and through other lab assignments, students will communicate with each other and their professor regularly and frequently.

If interacting with students outside the LMS, explain how additional interactions with students outside the LMS will enhance student learning.

Students may prefer to contact their professor via email or on the phone, which allows for an improved experience for those who communicate better in those contexts. The professor may direct students to access free supplemental resources as well.

Other Information

MIS Course Data

CIP Code

27.0101 - Mathematics, General.

TOP Code

170100 - Mathematics, General

SAM Code

E - Non-Occupational

Basic Skills Status

Basic Skills

Prior College Level

Four levels below transfer

Cooperative Work Experience
Not a Coop Course

Course Classification Status
Other Non-credit Enhanced Funding

Approved Special Class
Not special class

Noncredit Category
Elem/Secondary Basic Skills

Funding Agency Category
Not Applicable

Program Status
Program Applicable

Transfer Status
Not transferable

General Education Status
Y = Not applicable

Support Course Status
N = Course is not a support course

Allow Audit
No

Repeatability
Yes

Repeatability Limit
NC

Repeat Type
Noncredit

Justification
The course is designed to allow students to learn, re-learn, and/or practice material that is fundamental to mathematics study. If a student has taken the course but is not confident enough in their skills to sign up for a more advanced course, they may repeat this course to improve both skills and confidence.

Materials Fee
No

Additional Fees?
No

Approvals

Curriculum Committee Approval Date
11/18/2021

Academic Senate Approval Date
12/09/2021

Board of Trustees Approval Date
01/21/2022

Chancellor's Office Approval Date
03/13/2022

Course Control Number
CCC000630462

Programs referencing this course
Rational Numbers Certificate of Competency (http://catalog.collegeofthedesert.eduundefined/?key=162)