REGENTS ONLINE CAMPUS COLLABORATIVE

Course Syllabus

Number Concepts for Elementary Education
MATH 1410
3 Credit Hours

Course Information

Course Description:

This course is designed to develop the mathematical thinking students will need as beginning elementary mathematics teachers. The foundations for learning mathematics will be examined along with fundamental concepts, the four basic operations of arithmetic, number theory, and proportional reasoning. Students will use the ten standards formulated by the National Council of Teachers of Mathematics throughout the course. Innovative manipulative activities will be integrated throughout the learning process for each topic.

Course Objectives:

Through the study of MATH 1410, the student will acquire the ability to:
1. Explain, illustrate, and use Polya's 4-step problem solving process: understand the problem, devise a plan, carry out the plan, look back;
2. Explain, illustrate, and apply the following strategies: make a drawing, guess and check, make a table, use a model, work backward, use a variable, make an organized list, and eliminate possibilities;
3. Apply concepts of patterns to problem solving: Fibonacci numbers, Pascal's triangle, arithmetic sequence, geometric sequence, triangular numbers, and finite differences;
4. Use algorithms for solving equations and inequalities in problem solving;
5. Use concepts of set theory in problem solving: disjoint sets, subsets, equal sets, one-to-one correspondence, finite sets, infinite sets, intersection of sets, union of sets, complement of a set, and Venn diagrams;
6. Use concepts of functions and graphs in problem solving;
7. Apply concepts of deductive reasoning to problem solving;
8. Represent numeric values using symbolisms of a variety of numeration systems: Egyptian, Roman, Mayan, and Hindu-Arabic;
9. Illustrate and apply models for numeration and place value in bases two through twelve;
10. Apply models for addition and subtraction algorithms;
11. Apply techniques for mental calculations: compatible numbers, substitutions, equal differences, and add-up method;
12. Apply techniques for estimation of sums and differences: rounding, compatible numbers, and front-end estimation;
13. Apply models for multiplication algorithms;
14. Apply techniques of mental multiplication: compatible numbers, substitutions, and equal products;
15. Apply techniques for estimation of products: rounding, compatible numbers, and front-end estimation;
16. Apply models for division algorithms;
17. Apply the technique of equal quotients for mental division;
18. Apply techniques for estimation of quotients: rounding, compatible numbers, and front-end estimation;
19. Apply concepts of exponents;
20. Apply concepts of number theory to problem solving: factors, multiples, divisibility, prime and composite numbers;
21. Apply concepts of greatest common divisor (factor) and least common multiple in problem solving;

22. Apply models for operations with integers;
23. Apply models for concepts of fractions: part-to-whole, division, and ratio;
24. Apply concepts of fraction relationships: equality, common denominators, inequality, density; mixed numbers, and improper fractions;
25. Apply algorithms for operations with fractions: addition, subtraction, multiplication, and division;
26. Apply concepts for mental calculations with fractions: compatible numbers, substitutions, equal differences, add-up, and equal quotients;
27. Apply concepts for estimation with fractions: rounding and compatible numbers;
28. Use concepts of fractions in problem solving;
29. Apply models for decimal concepts: decimal squares and number line;
30. Apply concepts of decimal relationships: equality and inequality;
31. Apply concepts of rational numbers: decimal form, density, and estimation;
32. Apply algorithms for operations with decimals: addition, subtraction, multiplication, and division;
33. Convert repeating decimals to rational numbers;
34. Apply concepts for mental computation with decimals: substitutions and add-up, equal quotients, and compatible numbers;
35. Apply concepts for estimation with decimals: rounding, front-end estimation, and compatible numbers;
36. And use concepts of ratio, proportion, and percent in problem solving.

Prerequisites and Co-requisites:

Documented eligibility for collegiate mathematics; one high school credit each in algebra I, algebra II, and geometry.

Course Topics:

Module 1 - Foundations

Module 2 - Fundamentals

Module 3 - Operations

Module 4 - Number Theory

Module 5 - Number systems

Module 6 - Proportion

Specific Course Requirements:

Basic familiarity with Microsoft Office components such as Word, PowerPoint, and FrontPage. Several word processing documents will be submitted. They should be submitted in Microsoft Word format. Many programs such as Microsoft Works and the word processor available for Macintosh computers can save documents in Word format. Although there is no requirement to purchase Microsoft Word, students must

discover a way to save documents in Word format. Word Perfect may not be used for assignment submissions.

Textbooks, Supplementary Materials, Hardware and Software Requirements

Required Textbooks:

Please visit the Virtual Bookstore to obtain textbook information for this course: http://rodp.bkstr.com

Supplementary Materials:

Students will find the use of a graphing calculator such as the TI-83 Plus helpful. A student's solution manual for the textbook is optional.

Hardware Requirements:

The minimum requirements can be found at http://www.tn.regentsdegrees.org/students/hardware_software.htm.

PC users…

- A minimum computer system that will help you access all the tools in the courses is a Pentium 166 or better
- 32 Megabytes of RAM or better
- A CD-ROM
- Windows 95 (or higher if possible)
- Communications software (this lets your computer talk to the modem)
- A modem (56k or better will give you best performance)
- And a dependable internet service provider (ISP). Any provider will do as long as you get an email account, have access to the World Wide Web, and don't have problems connecting.
- For a list of ISPs in your area see The List

For Mac users…

- Minimum system requirements for Mac users are a 604 PowerPC processor Preferably a G3 (iMac are included) or G4 processor computer running Mac OS 8.5 or above
- Along with internet browsers Explorer 5.0 or Netscape 4.75.

- Your Macintosh should have a minimum or 64 MB RAM, preferably 128 with at least 25 MB assigned to your browser. If you need assistance in adjusting memory please refer to your Apple Help file searching under the header Memory - Adjusting your memory usage. It is advised that you not have multiple applications open while working in your browser within the Online Degree Program. This requires more RAM and will cause the browser to run very slowly.

- You also need communications software (this lets your computer talk to the modem)

- A modem (56K or better will give you best performance); and a dependable internet service provider (ISP). Any provider will do as long as you get an email account, have access to the World Wide Web, and don't have problems connecting or maintaining a connection.

Remember! These specifications are minimal, and you'll get by with them, but more sophisticated systems are better. Also, the minimum requirements can be found at

Software Requirements:

The minimum requirements can be found at
http://www.tn.regentsdegrees.org/students/hardware_software.htm.

Instructor Information

Please see the separate page inside the course to find instructor contact information as well as a statement of virtual office hours and other communication information.

Assessment and Grading

Testing / Grading Procedures:

Testing Procedures:

All testing will be done online. Students are honor-bound to produce work which is completely their own.

Grading Procedure:

Each of the 6 modules will include discussions, web assignments, and a quiz. Assignments will count 10 points each, quizzes will count 50 points each, homework will count 100 points, total participation will count 100 points, and the individual project will count 100 points. The final exam will count 200 points.

Quizzes and Final Exam

Module 1 Quiz – 50 points

Module 2 Quiz – 50 points

Module 3 Quiz – 50 points

Module 4 Quiz – 50 points

Module 5 Quiz – 50 points

Module 6 Quiz – 50 points

Total Possible Points – 300

Final Exam – 200 points

Grading Scale:

Total Possible Points 1000

A = 900-1000 – (90% - 100%)

B = 800-899 – (80% - 89%)

C = 700-799 – (70% - 79%)

D = 600-699 – (60% - 69%)

F = Below 600 – (0% - 59%)

Assignments and Participation

Assignments and Projects:

Assignments:
A sequenced list of assignments are arranged by module.
Each assignment is worth 10 points.

Module 1:
Assignment 1 - NCTM
Assignment 2 - Venn Diagram
Module 2:
Assignment 3 - Sets
Assignment 4 - Base 10
Assignment 5 - Base 7
Module 3:
Assignment 6 - Add

Assignment 7 - Subtract
Assignment 8 - Multiply
Assignment 9 - Divide

Assignment 10 - Input
Assignment 11 - Plot
Module 4:
Assignment 12 - Factor
Assignment 13 - Month
Assignment 14 - GCF_LCM
Module 5:
Assignment 15 - Integer
Assignment 16 - Frac_Add
Assignment 17 - Frac_Mult
Assignment 18 - Decimals
Module 6:

Assignment 19 - Ratio
Assignment 20 - Percent

Total Possible Points – 200

HomeworkAssignments:
Homework will be worked through Coursecompass using MyMathLab. Your homework assignments will be averaged.
Total Possible Points – 100

Project:
A project will be due in Module 6. You must create something original and, of course, the activity must be one you would use to teach a mathematics concept covered in the six modules. The project will be worth 100 points.
Total Possible Points – 100

Class Participation:

All students must participate in all interactive aspects of the course. Students must communicate with other students through the discussion board, students are expected to communicate with the instructor as a learning resource, and students must check the course bulletin board frequently for announcements.

The grading of class participation are as follows:

Module 1
Introduction – 10 points
Questions and/or Helpful Replies – 10 points

Module 2
Using Children's Literature in Math Class – 10 points
Questions and/or Helpful Replies – 10 points

Module 3

Questions and/or Helpful Replies – 10 points

Module 4
Questions and/or Helpful Replies – 10 points

Module 5
Performance with Fractions – 10 points
Questions and/or Helpful Replies – 10 points

Module 6
Helpful Internet Site – 10 points
Questions and/or Helpful Replies – 10 points

Total Possible Points – 100

Punctuality:

Course Ground Rules

A reiteration and emphasis of certain rules and course expectations. For example, Participation is required, Expected to communicate with other students in team projects, Learn how to navigate in D2L, Keep abreast of course announcements. Use the assigned college or university e-mail address as opposed a personal e-mail address. Address technical problems immediately. Observe course etiquette at all times.

Guidelines for Communications

Email:

- Always include a subject line.
- Remember without facial expressions some comments may be taken the wrong way. Be careful in wording your emails. Use of emoticons might be helpful in some cases.
- Use standard fonts.
- Do not send large attachments without permission.
- Special formatting such as centering, audio messages, tables, html, etc. should be avoided unless necessary to complete an assignment or other communication.
- Respect the privacy of other class members

Discussion Groups:

- Review the discussion threads thoroughly before entering the discussion. Be a lurker then a discussant.
- Try to maintain threads by using the "Reply" button rather starting a new topic.
- Do not make insulting or inflammatory statements to other members of the discussion group. Be respectful of others ideas.
- Be patient and read the comments of other group members thoroughly before entering your

remarks.
- Be cooperative with group leaders in completing assigned tasks.
- Be positive and constructive in group discussions.
- Respond in a thoughtful and timely manner.
- More information is available in this link to discussion guidelines.

Chat:

Chat is seldom used in RODP. If for some reason it is opened:

- Introduce yourself to the other learners in the chat session.
- Be polite. Choose your words carefully. Do not use derogatory statements.
- Be concise in responding to others in the chat session.
- Be prepared to open the chat session at the scheduled time.
- Be constructive in your comments and suggestion

Web Resources:

- Columbia Guide to Online Style by Janice R. Walker and Todd Taylor
- Citation Styles Online http://www.bedfordstmartins.com/online/cite6.html

Library

The Tennessee Virtual Library is available to all students enrolled in the Regents Degree Program. Links to library materials (such as electronic journals, databases, interlibrary loans, digital reserves, dictionaries, encyclopedias, maps, and librarian support) and Internet resources needed by learners to complete online assignments and as background reading must be included in all courses.

Plagiarism

What is Plagiarism?

Plagiarism is representing someone else's intellectual property as your own. You put yourself at risk of plagiarizing when you fail to adequately cite the original source material from which you took words and ideas.

Students With Disabilities

Qualified students with disabilities will be provided reasonable and necessary academic accommodations if determined eligible by the appropriate disability services staff at their home institution. Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility for specific accommodations from the disability services staff at the home institution. It is the student's responsibility to initiate contact with their home institution's disability services staff and to follow the established procedures for having the accommodation notice sent to the instructor.

Course Syllabus

Syllabus Changes

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.

Technical Support

Telephone Support:

AskRODP Help Desk (toll free number 1-866-550-7637) or go to the AskRODP website at: http://help.rodp.org/

If you are having problems:

- logging into your course
- timing out of your course
- "technical" related issues for D2L (it takes a long time to click around my course)
- using your course web site tools

If you contact Technical Support by phone please be at your computer and be prepared to provide the following information: (If you do not know the information below please call 1-866-550-7637)

- Your username
- Your password
- The URL, (address, "http://...") you are unable to access
- Your instructor's name (Ex.: Dr. Charles Cooper)
- Your course number, section and name (EX: EDU 1120 Introduction to Teaching)
- Are you using a PC or MAC
- Your operating system (Windows 98, NT, 2000, Vista, etc.)
- Browser type and version (EX: Internet Explorer 7)