MED 645: INTERVENTIONS IN MATHEMATICS

Instructor: Bill Blubaugh, Ph.D.  
Credit: 3 Semester Hours  
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A. COURSE DESCRIPTION:
This course constitutes a mathematics education component of the Intervention Specialist degree program within the College of Education and Behavior Sciences, School of Special Education. The course examines theoretical and practical approaches to mathematics instruction for youth with disabilities at the secondary school level. This course is designed to enable graduate students to effectively select and implement research and evidence-based mathematics interventions for individuals and groups of secondary school students.

B. COURSE GOALS AND OBJECTIVES:
1. Students will extend and refine knowledge of interventions for acquisition, maintenance, generalization, and application of knowledge and skills at the individual and classroom levels. They will:
   a. show how to use the types of mathematics interventions commonly used for students with special needs including: strategy instruction, using technology (such as websites and other mathematical tools) for instruction, frequent use of real-world problems, graphic organizers, instructional adaptations, graduated instructional sequence, and use of varied student groupings.
   b. describe the kinds of interventions that best match the unique needs of students in their school (e.g., keeping in mind such factors as age, skill fluency, and cultural needs).
   c. test the intervention models with regard to questions of authenticity, generalization, retention, and application.

2. Students will extend and refine their teaching skills regarding how student development, mathematics content, and pedagogical skills intersect. They will become more skillful regarding:
   a. some of the common student math difficulties found in today’s schools.
   b. how learner characteristics impact mathematics skill development.
   c. procedural and conceptual mathematical understandings.
   d. different teaching/learning strategies in mathematics.
   e. effective instructional practices in mathematics.

3. Students, who are out in the schools, when possible will collaborate with regular mathematics classroom teachers, paraprofessionals, and possibly other staff to develop a shared vision of a mathematics intervention model. They will:
   a. develop common goals of the staff with regard to mathematics interventions.
   b. speak fluently about student skills and appropriate assessment models.
   c. develop and present a proposal for the implementation of effective interventions at the individual and classroom level to parents, teachers, and relevant staff.

4. Students, when possible, will work with regular mathematics classroom teachers, paraprofessionals, and other staff on the development and implementation of mathematics interventions and continuous monitoring strategies.
They will:

a. analyze needs of the staff (paraprofessionals, teachers, other relevant staff) with regard to the implementation of the intervention.
b. model and provide feedback on effective instructional practices in mathematics.
c. describe the contents of a list of websites and resources that can help others in the development, implementation, or evaluation of the intervention plan.

5. Students will extend their ability to assess at the individual and classroom levels in mathematics.
They will:

a. review assessments practices commonly used in mathematics instruction.
b. distinguish assessment tools and practices (e.g., diagnosing error patterns, providing data driven instruction, monitoring progress) in mathematics.
c. critique assessments in relation to principles of quality assessment and how these assessments meet the unique needs of students in their school setting.
d. be able to communicate effectively how the outcomes of assessments results inform instructional decisions
e. recognize the importance of research and evidence-based assessments in secondary mathematics courses.

C. CONTENT OF THE COURSE:
Course material is presented in 5 areas, which vary in length based on the amount of content and expected activities. The content of these five areas are integrated throughout the eight unit assignments and the other three course requirements (intervention projects, review and critique of intervention strategies, and weekend requirements). The areas:

1. Examining intervention models in mathematics at the individual and class levels
   - Identifying and describing common mathematical interventions
   - Investigating and critiquing the appropriateness of each mathematics interventions
   - Conceptualizing a model that is unique to the needs of a their school and its members

2. Identifying what good teachers know about mathematics instruction
   - Understanding the unique needs of learners (based on age, skills, and cultural needs)
   - Examining mathematics content knowledge needed by teachers
   - Demonstrating effective teaching strategy in mathematics
   - Examining effective instructional practices

3. Describing the importance of math assessment in becoming an intervention specialist
   - Examining basic principles underlying quality assessment in mathematics
   - Communicating instructional practices in mathematics
   - Providing data driven instruction in mathematics

4. Mental mathematics modeling and shared visions for collaboration
   - Describing effective communication in collaboration
   - Examining ways to collaborate with paraprofessionals, teachers, parents, and others

5. Supporting others through coaching
   - Modeling effective mathematics teaching
   - Understanding the developmental process of learning to teach
   - Identifying the needs of beginning & experienced math teachers, and paraprofessionals
D. COURSE REQUIREMENTS:
1. Unit Assignments
Participation in regular unit assignment is a critical part of the course content delivery. The student is expected to fulfill all unit requirements of this online course, participating in discussions, contributing to group activities, completing projects, and responding to online requests. All unit-specific work is due before a respective unit ends, unless otherwise indicated. Absences from classes are subject to make-up assignments that are designed to address missed content and experiences.

2. Intervention Projects
Collaborate, when possible, with mathematics teachers, other school personnel and possibly parents to design, disseminate, and implement a model plan for improved mathematics instruction, mainly at the individual level. This plan will show evidence of data driven decision making and provide a plan to evaluate the effectiveness of the intervention. Students will select tasks that are research-based with an intervention in mathematics that addresses a need in their particular school environment.

3. Review and Critique Intervention Strategies
Participants will read and report on several projects and ideas that involve interventions in mathematics.

E. GRADING CRITERIA
Student grades are based on points earned according to the following table:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units Assignments</td>
<td>250</td>
</tr>
<tr>
<td>Intervention Projects</td>
<td>100</td>
</tr>
<tr>
<td>Intervention Strategies</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total Points</strong></td>
<td><strong>400</strong></td>
</tr>
</tbody>
</table>

The following are the guidelines for determining final grades:

**Your Final Course Grade is Calculated as a Percent of Total Points Obtained**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent Range</th>
<th>Points Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>92.5% or greater</td>
<td>370 or more points</td>
</tr>
<tr>
<td>A-</td>
<td>90.0 to 92.4%</td>
<td>360 to 369 points</td>
</tr>
<tr>
<td>B+</td>
<td>87.5% to 89.9%</td>
<td>350 to 359 points</td>
</tr>
<tr>
<td>B</td>
<td>82.5% to 87.4%</td>
<td>330 to 349 points</td>
</tr>
<tr>
<td>B-</td>
<td>80.0% to 82.4%</td>
<td>320 to 329 points</td>
</tr>
<tr>
<td>C+</td>
<td>77.5% to 79.9%</td>
<td>310 to 319 points</td>
</tr>
<tr>
<td>C</td>
<td>72.5% to 77.4%</td>
<td>290 to 309 points</td>
</tr>
<tr>
<td>C-</td>
<td>70.0 to 72.4%</td>
<td>280 to 289 points</td>
</tr>
<tr>
<td>D+</td>
<td>67.5% to 69.9%</td>
<td>270 to 279 points</td>
</tr>
<tr>
<td>D</td>
<td>62.5% to 67.4%</td>
<td>250 to 259 points</td>
</tr>
<tr>
<td>D-</td>
<td>60% to 62.4%</td>
<td>240 to 249 points</td>
</tr>
<tr>
<td>F</td>
<td>59.9% or below</td>
<td>239 or fewer points</td>
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</tbody>
</table>
F. UNC POLICIES

**Student Handbook:** UNC’s policies and recommendations for academic misconduct will be followed. Consult your student handbook for university policies on student conduct in the classroom, cheating, plagiarism, and other academic expectations (http://www.unco.edu/dos/handbook/index.html).

You are expected to attend class and take responsibility for your own learning.

**Disability Support Services:** Students who believe that they may need accommodations in this class are encouraged to contact the Disability Support Services at (970)-351-2289 as soon as possible to ensure that accommodations are implemented in a timely fashion.

**Honor Code:** All members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UNC community’s academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

**Portable Electronic Devices** - Please extend courtesy to your instructor and fellow students by turning off your portable electronic devices such as: cell phones, pagers, and iPods. Although not an audio issue, text-messaging is a distraction to other students and prevents you from full participation in class. You should keep your portable electronic devices in your backpack or purse during class. Your personal electronic devices should not be on your desks. If you know that you may need to accept an emergency phone call during class or if you have children in childcare or school, please let the instructor know. If you need to take a phone call during class, please step out of the classroom while you complete your call. Thank you for your cooperation.

G. REQUIRED READING


H. OTHER POSSIBLE READINGS:


Burke, M., Kehle, P. et al. (2006). *Navigating through Number & Operations in Grades 9-12*. Reston, VA: NCTM.


