Salish Kootenai College
Teaching Secondary Mathematics – Middle Grades
EDUC 397

1. Course Information

a. *Number:* EDUC 397
b. *Credits:* 3
c. *Prerequisite:* EDUC 210 **or** EDUC 372 **and** acceptance into TEP program
d. *Corequisite:* none
e. *First Offered:* Winter 2015-16.
f. *Meeting Room and Times:* Stevenson Building – Room 113
Tuesday and Thursday – 1:00-2:20

2. Personal Information

a. *Instructor:* Dr. Terry Souhrada
b. *Office Location:* Education Building – Room 104
c. *Telephone:* (406) 275–4764
d. *Office Hours:* Monday-Friday – 10:30 – 12:00 and by appointment

3. Required Materials

a. Texts: (***for those with EDUC 210 as their partial prerequisite***)

Van de Walle, J.A., Lovin L.H., Bay-Williams, J.M. and Karp, K.S. (2014). *Teaching Student-Centered Mathematics: Developmentally Appropriate Instruction for Grades 6-8, 2nd Ed.* San Francisco, CA: Pearson Publishing

AND

Rock, D. and Brumbaugh, D.K. (2013). *Teaching Secondary Mathematics, 4th Ed.* New York, NY: Routledge

Text: (***for those with EDUC 372 as their partial prerequisite***)

Van de Walle, J.A., Karp, K.S., and Bay-Williams, J.M. (2012). *Elementary and Middle School Mathematics: Teaching Developmentally,8th Ed.* San Francisco, CA: Pearson Publishing

b. Other:

graphing calculator (preferred models: either Texas Instruments TI-83/84 or TI-*n*spire family.)

4. Description

Teaching Secondary Mathematics – Middle Grades provides research-based and standards-supported strategies for teaching math in the middle grades (5-8). Focus will be on development of grade appropriate lessons, which support the process standards as well as content standards that can be used in classrooms with diverse mathematical abilities. Imbedded within this course is a practicum consisting of 6 hours of observation/presentation in middle grade mathematics classrooms.

Throughout the course lessons, projects, and other course products are created and presented. Grade level mathematical content and developmentally appropriate pedagogical strategies serve as the basis for these products.

5. Course Objectives

Cultural Relevancy:
Students' traditional and practical experience will be integrated into the problem solving approach. Students will address the IEFA Essential Understandings in one learning activity that they are required to create.

Critical Thinking:
Students will analyze traditional versus reform instructional approaches used in various textbooks. Student discussions and panels will be used to debate real-life classroom scenarios in order to anticipate professional ways of dealing with said issues.

Citizenship:
Students will teach mathematics lessons to partnering classrooms in the field.

Communication:
Students will develop lesson plans that elicit deep understanding and classroom discourse among students. Students will partner with a peer when teaching lessons out in the field. One student of the pair will teach while the other observes and provides feedback. The pair will change roles each time they teach in the field.

6. Course Requirements

In this courses candidates will create several end-of-course products. Candidates will:

1. keep a weekly journal to record thoughts and observations on which to base updates of their educational philosophy;
2. create and implement a culturally-relevant interdisciplinary lesson including a pre- and post-assessment;
3. design a one-day problem solving activity that includes tasks designed to create and encourage cognitive dissonance and have a high level of cognitive demand;
4. write several short reflective papers focusing on the major influences impacting the teaching of middle grade mathematics to be included in your journal.
5. create and update TEP Portfolio artifacts including update teaching philosophy.

7. Credit Hours

Following the SKC Credit Hour policy, to meet the identified student learning outcomes of this course, this course, delivered over a 10-week term, will approximate:

3 hours/week classroom or direct faculty instruction
6 hours/quarter of practica or field work in the form middle grade mathematics classroom observation and participation
3 hours/week research

In addition, out-of-class student work will approximate a minimum of 6 hours each week of work as needed to meet the course learning objectives.

8. Grading

Grades for this course are earned based on the criteria and rubric outlined below.

a. An Incomplete grade ("I") is NOT an option with the exemption of an extreme emergency or the death of a family member. In either case, the instructor must be notified within 48 hours and has sole discretion in its granting.

b. Your final grade will be determined as outlined below.

Journal Review	20	(10 pts. each)	*Grades by percentage*
Observation Reflections	40	(10 pts. each)	A→ $90 \leq$ grade ≤ 100
Cognitive Dissonance/Demand Lesson (TEP)	35		B→ $80 \leq$ grade < 90
IEFA Interdisciplinary Unit Plan (TEP)	50		C→ $70 \leq$ grade < 80
Parent Letter (TEP)	25		D→ $60 \leq$ grade < 70
In-Class Instruction	25		F → grade < 60
Revised Teaching Philosophy (TEP)	35		
Total Points	**230**		

If for any reason work is to be handed in after an identified deadline, previous arrangements must have been made with the instructor *prior* to the deadline. Late work *will not be accepted* if not prearranged.

9. Attendance

Although no attendance points will be given, you will be expected to be in class on time. You are expected to stay in class until the designated time set for dismissal. If you must leave early inform the instructor *prior to the start of class*.

Class time is not a time to be engaged in personal communications. Use of cell phones/personal communication devices is strictly to carry out class requirements. So all devices should be in *silenced mode* during class

For you to get the most from this course full participation is a necessity. Being a fully participating member in this course requires that you come with the materials, tools, and any completed assignments necessary for each class period. **Students are responsible for coming prepared to class.**

There will be many activities and assignments you will not be able to make up due to the nature of the assignment. This is a course designed to help you prepare professionally to be a teacher. Teachers are required to be in school at all times and on time. Consistent attendance is evidence that you are willing accept the responsibilities expected of a professional educator. This is professional responsibility. Poor attendance will result in missed information, missed assignments and tests, and possible failure of the course as well as a reflection of your professional disposition.

Additionally, you will be observing current classrooms. These teachers allow you to enter their classroom as a professional courtesy and to help you further your education. Be in their classroom on the agreed upon dates and on time. Be prompt, courteous, respectful, and professionally dressed when attending their classes. You are a guest in their classroom and a representative of the SKC Education Division. Represent yourself and the college professionally and courteously.

10. Other:

Academic Honor Code

All course work shall follow the guidelines of the Academic Honor Code as set forth by the SKC Student Handbook. Do your own work; allow other students to do their own work. **Plagiarism** involves the taking of someone else's words, ideas, or writings and presenting them as your own. Avoid plagiarism, and always acknowledge the ideas of others and cite your sources of information. Violation of the Academic Honor Code may result in failure of the assignment, the course, or possible expulsion from school.

Course Responsibilities

Knowledge of the course content, class lectures, assignments, activities, and syllabus content are the responsibility of the student regardless of absenteeism. Syllabus content and calendars are tentative; instructors will notify you of any changes.

Instructional Methodologies

The methodologies of instruction in this course will follow a constructivist format and use techniques of inquiry, construction of knowledge, discussions, lecture, and independent practice as well as other instructional practices. One such practice is the effective and appropriate instructional use of technology to enhance learning experiences.

Available Help

Reasonable accommodations are provided for eligible students with identified disabilities. The College complies with the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Students may contact the College's Disability Officer, Stanley Fleming (stanley_fleming@skc.edu, 406.275.4968) or consult the SKC web page for Students with Disabilities for more information.

Student Safety and Title IX

Title IX: The U.S. Department of Education's Office for Civil Rights (OCR), enforces Title IX of the Education Amendments of 1972. Title IX protects people from discrimination based on sex in education programs or activities that receive Federal financial assistance. Title IX states that:

> No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.

All employees at SKC are considered **"Responsible Employees"** which requires them to report incidents of gender-based discrimination (sexual violence, sexual harassment, rape, sexual assault, domestic violence, and/or stalking). In accordance with Title IX laws, students must be made aware of the following: If any employee of SKC, including instructors, learns of any potential gender-based discrimination, they are required to notify the Title IX Coordinator, **Rachel Andrews-Gould** (275-4985, located in Big Knife Building), immediately. Once an incident is reported to Title IX, the student will be contacted by the Title IX Coordinator for follow up. Students can also report directly to the Title IX coordinator in regards to any gender-based discrimination.

If any student wants to speak with someone confidentially, the following resources are available:

Center for Prevention and Wellness Agnes Kenmille Building (#51) 406.275.4913 or 406.275.4744	SAFE Harbor Advocacy Services 24-Hour Advocacy 406.676.0800

Speaking with a confidential resource does not preclude students from making a formal report to the Title IX Coordinator if and when they are ready. In the confidential setting, students will be made aware of available resources and reporting options. An advocate is available for all students upon request through the Center for Prevention and Wellness.

SKC Retention

The SKC Retention Team consists of SKC staff and faculty who provide student-centered support services on a daily basis. The SKC Retention Team is here to help you to be successful in reaching your educational goals. You can contact the SKC Retention Team yourself, or your instructor may refer you (for example, if you "disappear" from class or they are concerned about your attendance and performance).

Syllabus Revision

The faculty reserves the right to revise the course syllabus or course content at any time. Students will be provided advanced notice of changes in writing.

11. Course Outline

Below each week is listed with an intended focus for that week. This schedule is tentative and subject to change. You will be notified of such changes as much in advance as possible.

Week 1 Introduction – Cognitive Dissonance/Demand and Productive Struggle – Middle Grade Mathematical Content – Getting an Observation Classroom – Artifacts for the TEP Portfolio

Week 2 Middle Grade Curriculum – Designing/Finding "Worthwhile" Tasks. – Manipulatives and Technology in Middle Grades – Middle Grade Classroom Management Issues – Classroom Observations 1 (min. 1.5 hrs FOCUS: teacher questioning, level of cognitive demand/dissonance and productive struggle, classroom management) –Cognitive Dissonance Lesson Draft *due*

Week 3 Backward Design and Unit as Planning Size – Assessing Individual Students in a Group Setting –*First observation reflection due – Cognitive Dissonance Lesson Due* – Culturally-Relevant Interdisciplinary Lesson Plan *outline due*

Week 4 Developing Lessons with Assessments (Pre and Post) – Observations 2 (min. 1.5 hrs FOCUS: mathematical connections, group interactions, effectiveness of groups, student assessment in group setting) – Culturally-Relevant Interdisciplinary Lesson Plan *draft due*

Week 5 Writing Effective Assessment Instruments – *Second observation reflection due – Journal Review due – Cognitive Dissonance Lesson Due*

Week 6 Evaluation Rubrics – Standards Based Assessment –Classroom Observations 3 (min. 1.5 hrs FOCUS: Cognitive Dissonance/Demand Lesson presentation, reflection and lesson revision with classroom teacher)

Week 7 Role of Administration, Parents, and Colleagues – Gaining Parental Involvement and Support – Finding/Building Support within/outside the School (blogs/listserves) – *Third observation reflection due – Culturally-Relevant (IEFA) Interdisciplinary Lesson Plan Due*

Week 8 Choosing a Textbook/Curriculum– Classroom Observations 4 (min. 1.5 hrs FOCUS: Culturally-Relevant Interdisciplinary Lesson Presentation) – Parent Night Presentation *draft due*

Week 91 Internet Resources for Middle Grades – *Fourth reflection due* (interdisciplinary lesson, characteristics of an effective middle grade mathematics teacher) – *Parent Night Presentation (to in-service teachers)* ***Wednesday, March 16, 2016***

Week 10 *Final Journal Review (due) – Updated Teaching Philosophy due – Updated TEP Portfolio due*

12. Standards Assessments

The content and assessment within this course, as with all the courses included as part of the Bachelor of Science in Secondary Education – Mathematics (BSSEM) degree program, is guided by various sets of standards. These standards serve as the goals and learning outcomes established for this course.

Below are the standards to be addressed within this course. You may receive a complete copy of these standards upon your request.

InTASC Standards

Standard #1: Learner Development

The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Standard #2: Learning Differences

The teacher uses understanding of individual differences and diverse cultures and com-munities to ensure inclusive learning environments that enable each learner to meet high standards.

Standard #3: Learning Environments

The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation.

Standard #4: Content Knowledge

The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

Standard #5: Application of Content

The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Standard #6: Assessment
The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Standard #7: Planning for Instruction
The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Standard #8: Instructional Strategies
The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Standard #9: Professional Learning and Ethical Practice
The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Standard #10: Leadership and Collaboration
The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

NCTM – 2012

Preservice teacher candidates

2a) use problem solving to develop conceptual understanding, make sense of a wide variety of problems and persevere in solving them, apply and adapt a variety of strategies in solving problems confronted within the field of mathematics and other contexts, and formulate and test conjectures in order to frame generalizations.

2b) reason abstractly, reflectively, and quantitatively with attention to units, constructing viable arguments and proofs, and critiquing the reasoning of others; represent and model generalizations using mathematics; recognize structure and express regularity in patterns of mathematical reasoning; use multiple representations to model and describe mathematics; and utilize appropriate mathematical vocabulary and symbols to communicate mathematical ideas to others.

2d) **o**rganize mathematical thinking and use the language of mathematics to express ideas precisely, both orally and in writing to multiple audiences.

2e) demonstrate the interconnectedness of mathematical ideas and how they build on one another and recognize and apply mathematical connections among mathematical ideas and across various content areas and real-world contexts.

3b) analyze and consider research in planning for and leading students in rich mathematical learning experiences.

3c) plan lessons and units that incorporate a variety of strategies, differentiated instruction for diverse populations, and mathematics-specific and instructional technologies in building all students' conceptual understanding and procedural proficiency.

3d) Provide students with opportunities to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace.

3e) implement techniques related to student engagement and communication including selecting high quality tasks, guiding mathematical discussions, identifying key mathematical ideas, identifying and addressing student misconceptions, and employing a range of questioning strategies.

3f) Plan, select, implement, interpret, and use formative and summative assessments to inform instruction by reflecting on mathematical proficiencies essential for all students.

3g) Monitor students' progress, make instructional decisions, and measure students' mathematical understanding and ability using formative and summative assessments.

4a) exhibit knowledge of adolescent learning, development, and behavior and demonstrate a positive disposition toward mathematical processes and learning.

4b) plan and create developmentally appropriate, sequential, and challenging learning opportunities grounded in mathematics education research in which students are actively engaged in building new knowledge from prior knowledge and experiences.

4c) incorporate knowledge of individual differences and the cultural and language diversity that exists within classrooms and include culturally relevant perspectives as a means to motivate and engage students.

4d) Demonstrate equitable and ethical treatment of and high expectations for all students.

4e) apply mathematical content and pedagogical knowledge to select and use instructional tools such as manipulatives and physical models, drawings, virtual environments, spreadsheets, presentation tools, and mathematics-specific technologies (e.g., graphing tools, interactive geometry software, computer algebra systems, and statistical packages); and make sound decisions about when such tools enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools.

5a) Verify that secondary students demonstrate conceptual understanding; procedural fluency; the ability to formulate, represent, and solve problems; logical reasoning and continuous reflection on that reasoning; productive disposition toward mathematics; and the application of mathematics in a variety of contexts within major mathematical domains.

5b) engage students in developmentally appropriate mathematical activities and investigations that require active engagement and include mathematics-specific technology in building new knowledge.

5c) Collect, organize, analyze, and reflect on diagnostic, formative, and summative assessment evidence and determine the extent to which students' mathematical proficiencies have increased as a result of their instruction.

6b) engage in continuous and collaborative learning that draws upon research in mathematics education to inform practice; enhance learning opportunities for all students' mathematical knowledge development; involve colleagues, other school professionals, families, and various stakeholders; and advance their development as a reflective practitioner.

6c) utilize resources from professional mathematics education organizations such as print, digital, and virtual resources/collections.

PEPP Standards

10.58.501 General Requirements

(1) All programs require that successful candidates:

(a) demonstrate understanding of and ability to integrate knowledge of the history, cultural heritage, and contemporary status of American Indians and tribes in Montana;

(b) demonstrate understanding of the central concepts, tools of inquiry, and structure of the discipline(s) he or she teaches and creates learning experiences that make subject matter meaningful for students;

(c) demonstrate understanding of how students learn and develop, and provide learning opportunities that support intellectual, social, and personal development;

(d) demonstrate knowledge of how students, within different populations, including Montana American Indians, differ in their approaches to learning and create instructional opportunities that are adapted to diverse learners;

(e) demonstrate understanding of personal, cultural and socioeconomic biases and teaching

(f) utilize a variety of instructional strategies to encourage students' development of critical thinking, problem solving, and performance skills;

(g) demonstrate understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation;

(h) demonstrate knowledge of effective verbal, nonverbal, media, and electronic communication techniques to teach the strategies of active inquiry, collaboration, and supportive interaction in the classroom;

(i) plan instruction based on knowledge of subject matter, students, the community, curriculum goals, and appropriate use of current and emerging technologies;

(j) demonstrate assessment strategies, tools, and practices to plan and evaluate effective instruction;

(k) demonstrate continued growth in knowledge related to a particular subject area and the teaching of it; and

(m) demonstrate the ability to foster contextual and experiential learning and to build connections between academic learning and the skills required in the present and future workforce.

10.58.518 Mathematics

(1) The program require that successful candidates:

(a) demonstrate knowledge and understanding of and apply the process of mathematical problem solving;

(c) communicate mathematical thinking orally and in writing to peers, faculty, and others;

(d) recognize, use, and make connections between and among mathematical ideas and in contexts outside mathematics to build mathematical understanding;

(e) use varied representations of mathematical ideas to support and deepen students' mathematical understanding;

(f) appropriately use current and emerging technologies as essential tools for teaching and learning mathematics; and

(g) support a positive disposition toward mathematical processes and mathematical learning.

(2) The program require that successful candidates demonstrate knowledge of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.

The items in the following table are included in TEP Portfolios for BSSEM students as Critical Assessments for the indicated standards.

Critical Assessment	**PEPPS** (10.58._)	InTASC	NCTM 2012
Cognitive Dissonance/Demand Lesson	501 – 1(b,c,f,g,i) 518 – 1(a,c,e), 2	1(i), 5(d,m)	2(a,b,c), 3(b,c,d,e), 4(c,e)
IEFA/Interdisciplinary Lesson Plan	501 – 1(a,c,d,e,i,j,m) 518 – 1(a,c,d,e,f), 2	5(a,j), 6(b), 7(o), 8(f)	2(a,b,c,e), 3(b,c,d,e,f,g), 4(c,d), 5(a,c)
Parent Letter	501 – 1(h) 518 –1(c,d), 2	1(c), 10(d)	2(d)