# http://www.ric.edu/webcommunications/images/SealWithText_Small_Black.pngUNDERGRADUATE CURRICULUM COMMITTEE (UCC) PROPOSAL FORM

## Cover page scroll over blue text to see further important [instructions](#instructions): please read.

**N.B. DO NOT USE HIGHLIGHT, please DELETE THE WORDS THAT DO NOT APPLY TO YOUR PROPOSAL**

**ALL numbers in section (A) need to be completed, including the impact ones.**

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| --- | --- | --- | --- | --- | --- |
| A.1. [Course or program](#Proposal) | **ELED 238: Teaching Functions and Algebra** | | | |  |
| [Replacing](#Ifapplicable) |  | | | |
| A.2. [Proposal type](#type) | **Course: creation** | | | |
| A.3. [Originator](#Originator) | **Anne M. Goodrow** | [Home department](#home_dept) | **Elementary Education** | | |
| A.4. [Context and Rationale](#Rationale) | The Elementary Education Department has carefully reviewed its programs to propose changes that will result in deeper and broader preparation for teacher candidates. The changes are a result of feedback from our PK-12 Elementary Education partners, feedback from teacher candidates, and feedback from the most recent RI Dept. of Education report. The changes respond to the changing job market in RI, in particular the need for middle level teachers of mathematics. ELED 238: Teaching Functions and Algebra is a new course that aims to help Elementary and Middle Level Mathematics teacher candidates integrate algebra concepts into the elementary mathematics curriculum and successfully teach algebra in the middle grades.  Algebra is not simply a course that students take in high school, although some often see it that way. Algebra is a gateway to higher-level mathematics. Because algebraic thinking is embedded throughout mathematics, even in the elementary years, it is essential that teacher candidates understand structures, patterns and generalizations, and the meaningful use of symbols and other representations that arise in our number system, in the properties of operations, and in functional relationships. These topics and others will be central to this 2-credit course, which is aligned to the Common Core State Standards for Mathematics (CCSS-M), and will feature mathematical investigations in an inquiry-based teaching and learning model, and in doing so, integrate technology. | | | | |
| A.5. [Student impact](#student_impact) | Teacher candidates in the Elementary Education with Middle Level Concentration in Mathematics will take this course, which focuses specifically on teaching and learning algebra in the elementary and middle level grades. | | | | |
| A.6. [Impact on other programs](#impact) | **None** | | | | |
| A.7. [Resource impact](#Resource) | [*Faculty PT & FT*](#faculty): | This program may add to the load of current faculty. | | | |
| [*Library*:](#library) | No impact other than changing reserves. | | | |
| [*Technology*](#technology) | Program needs include classrooms with available technology, such as document cameras and smart boards. iPads and educational apps will also be important components. | | | |
| [*Facilities*](#facilities): | Adequate classroom space to account for potential changes in scheduling, cohort/practicum models, and group advising/learning opportunities are important for program success. | | | |
| A.8. [Semester effective](#Semester_effective) | **Fall 2019** | A.9. [Rationale if sooner than next Fall](#Semester_effective) | |  | |

B. [NEW OR REVISED COURSES](#delete_if)  **DO NOT use highlight. Delete this whole page if the proposal does not include a new or revised course.**

|  | Old ([for revisions only](#Revisions)) | New Examples are provided for guidance, delete the ones that do not apply |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title) |  | **ELED 238** |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title) |  | **Teaching Functions and Algebra** |
| B.4. [Course description](#description) |  | Students examine concepts central to teaching and learning algebra in elementary and middle school. Generalization, symbols, patterns, functional relationships, and representations are investigated in an inquiry-based teaching and learning model. |
| B.5. [Prerequisite(s)](#prereqs) |  | **Admission to FSEHD, and MATH 144** |
| B.6. [Offered](#Offered) |  | **Fall | Spring |** |
| B.7. [Contact hours](#contacthours) |  | **2** |
| B.8. [Credit hours](#credits) |  | **2** |
| B.9. [Justify differences if any](#differences) |  | |
| B.10. [Grading system](#grading) |  | **Letter grade** |
| B.11. [Instructional methods](#instr_methods) |  | **| Lecture |Small group |** |
| B.12.[Categories](#required) |  | **Required for major** |
| B.13. Is this an Honors course? |  | **NO** |
| B.14. [General Education](#ge)  N.B. Connections must include at least 50% Standard Classroom instruction. |  | **NO** |
| B.15. [How will student performance be evaluated?](#performance) |  | **Presentations | Papers (lesson plans)|Class Work** |
| B.16. [Redundancy statement](#competing) |  |  |
| B. 17. Other changes, if any |  | |

| B.18**.** [**Course learning outcomes**](#outcomes)**: List each one in a separate row** | [**Professional Org.Standard(s)**](#standards)**, if relevant** | [**How will each outcome be measured**](#measured)**?** |
| --- | --- | --- |
| Identify and describe connections between number and algebraic thinking. | FSEHD Outcome 1; NCTM/CAEP 1a, 2b, 5a, NCTM/CAEP addendum B.1.1; CCSS-M 6.EE.A1 | Class discussion  Written reflection |
| Describe patterns and sequences and attend to their structure. | FSEHD 1, 3; NCTM/CAEP 1a, 2b, 3a, 4e  CCSS-M 4.OA.C.5, 5.OA.B3 | Class discussion  Written reflection  Tasks and problems |
| Investigate applications of the properties of operations in algebra, generalizations of properties, and explore meaningful tasks for students in elementary and middle school. | FSEHD 1, 2, 3; NCTM/CAEP 1a, 2b, 3a, 4e, 5a NCTM/CAEP addendum B.2.1;  CCSS-M 6.EE.B.6, 6.EE.B.7, 6.EE.C.9, 7.EE.A1, 7.EE.B.3, 7.EE.B.4 | Class discussions  Written reflections  Lesson plan development  Lesson plan/task analysis  Text analysis |
| Analyze students’ thinking about the equals sign and identify strategies to broaden understanding and remediate misconceptions. | FSEHD 1, 2,3; NCTM/CAEP 1a, 3c, 3e, 3f, 3g, 4b, 5c; CCSS-M 6.EE.A.3, 6.EE.A.4 | Student interview and analysis  Lesson plan/task analysis |
| Investigate and describe functions and their representation (e.g. tables, graphs, and equations). | FSEHD 1, 3; NCTM/CAEP 1a, 2a, 2b, 2c, 3a, 3e, 4e NCTM/CAEP addendum B.1.3, B.2.2, B.2.3;  CCSS-M 8.FA.1, 8.FA.2, 8.FA.3, 8.FB.4, 8FB.5 | Class discussion  Written reflection  Tasks and problems (including use of technology) |
| Apply the Common Core Standards for Mathematics Practice to functions and algebra. | FSEHD 3, 4; NCTM/CAEP 2f, 3a, 3b | Class discussion  Written reflection  Tasks and problems  Lesson plan/task analysis |

| B.19. [**Topical outline**](#outline)**: Do NOT insert whole syllabus, we just need a two-tier outline** |
| --- |
| 1. What is Algebra?    1. Generalizing, reasoning, and proof    2. Common Core Standards for Mathematical Practice    3. Common Core Standards for Algebra and Algebraic Thinking    4. Progressions Documents    5. Algebraic Thinking in Elementary Mathematics 2. Properties of Operations   a) Properties as Generalizations b) Order of Operations   1. Equality    1. Children’s conception of the meaning of the equals sign    2. Developing understanding of equality 2. Patterns   a) Identifying patterns  b) Representing patterns  c) Different types of patterns  i.) Repeating patterns  ii.) Arithmetic and geometric patterns  iii.) Fibonacci sequence   1. Concept of Function    1. Finding function rules    2. Representing functions 2. Tables 3. Graphs 4. Equations 5. In writing 6. Concept of a Variable a) Meaning of variable b) Use of symbols   c) Generalization |
|  |

## D. Signatures

* Changes that affect General Education in any way MUST be approved by ALL Deans and COGE Chair.
* Changes that directly impact more than one department/program MUST have the signatures of all relevant department chairs, program directors, and relevant dean (e.g. when creating/revising a program using courses from other departments/programs). Check UCC manual 4.2 for further guidelines on whether the signatures need to be approval or acknowledgement.
* Proposals that do not have appropriate approval signatures will not be considered.
* Type in name of person signing and their position/affiliation.
* Send electronic files of this proposal and accompanying catalog copy to [curriculum@ric.edu](mailto:curriculum@ric.edu) and a printed or electronic signature copy of this form to the current Chair of UCC. Check UCC website for due dates.

##### D.1. Approvals: required from programs/departments/deans who originate the proposal. may include multiple departments, e.g., for joint/interdisciplinary prposals.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Carolyn Obel-Omia | Chair of Elementary Education |  |  |
| Julie Horwitz or Gerri August | Co-Deans of Feinstein School of Education and Human Development |  |  |