# 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.**

|  |  |  |
| --- | --- | --- |
| A.1. [Course or program](#Proposal) | **ELED 248: Teaching Data and Statistics** |  |
| [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 248: Teaching Data and Statisticsis a new course that aims to help Elementary and Middle Level Mathematics teacher candidates successfully teach data and statistics concepts in the middle grades. To teach data and statistics well, teacher candidates must develop deep understanding of not only statistics content, but also the ways in which students learn statistics in the elementary and middle grades. The American Statistical Association describes students’ learning of statistics as a developmental process; in this 2-credit inquiry-based course teacher candidates learn statistics content and how they can help students develop understanding of that content. This course will be aligned to the Common Core State Standards for Mathematics (CCSS-M), feature mathematical investigations in an inquiry-based teaching and learning model, use manipulatives and other hands-on materials, and integrate technology.A major objective of statistics education is to help students develop statistical thinking. Statistical thinking, in large part, must deal with this omnipresence of variability; statistical problem solving and decision making depend on understanding, explaining, and quantifying the variability in the data…“The focus on variability naturally gives statistics a particular content that sets it apart from mathematics, itself, and from other mathematical sciences, but there is more than just content that distinguishes statistical thinking from mathematics. Statistics requires a different kind of thinking, because data are not just numbers, they are numbers with a context*.* In mathematics, context obscures structure. In data analysis, context provides meaning.” (Moore and Cobb, 1997) American Statistical Association (2007). Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report: A Pre-K–12 Curriculum Framework. Alexandria, VA: American Statistical Association.  |
| A.5. [Student impact](#student_impact) | Teacher candidates in the Elementary Education Teaching Concentration in Middle Level Mathematics will take this course, which focuses specifically on teaching and learning data and statistics 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)) | NewExamples are provided for guidance, delete the ones that do not apply |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title)  |  | **ELED 248** |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title)  |  | **Teaching Data and Statistics** |
| B.4. [Course description](#description)  |  | Students examine concepts central to teaching and learning data and statistics in elementary and middle school. Data collection, representation, analysis, probability, and measures of central tendency are investigated. |
| 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 differences between mathematics and statistics.  | FSEHD 1 RIPTS 2, 8, 9[CCSS-M6.SP.A.1](http://www.corestandards.org/Math/Content/6/SP/A/1/)NCTM/CAEP 1a, 2a, 2c | Whole group discussionSmall group work |
| Discuss statistics education as a developmental progression that begins in the early elementary grades.  | FSEHD 2, 4RIPTS 3, 4, 8, 9, 10NCTM/CAEP 3a, 4a, 5b | Whole group and small group discussion• Examination of data and statistics tasks  |
| Create questions that can be answered with data.  | FSEHD 1, 2, 3[CCSS-M1.MD.C.4](http://www.corestandards.org/Math/Content/1/MD/C/4/)[2.MD.D.10](http://www.corestandards.org/Math/Content/2/MD/D/10/)[3.MD.B.3](http://www.corestandards.org/Math/Content/3/MD/B/3/)[6.SP.A.1](http://www.corestandards.org/Math/Content/6/SP/A/1/)RIPTS 1, 2, 4, 5, 6, 8, 9 | Data lesson developmentTasks and problems |
| Identify and apply appropriate methods to collect and analyze data. | FSEHD 1, 2, 3NCTM/CAEP 2a, 2c, 2d, 4e,NCTM/CAEP addendum B.4.2, B.4.3RIPTS 1, 2, 4, 5, 6, 8, 9[CCSS-M 1.MD.C.4](http://www.corestandards.org/Math/Content/1/MD/C/4/)[2.MD.D.10](http://www.corestandards.org/Math/Content/2/MD/D/10/)[3.MD.B.3](http://www.corestandards.org/Math/Content/3/MD/B/3/)[6.SP.A.2](http://www.corestandards.org/Math/Content/6/SP/A/2/)[6.SP.B.4](http://www.corestandards.org/Math/Content/6/SP/B/4/)[7.SP.A.1](http://www.corestandards.org/Math/Content/7/SP/A/1/)[8.SP.A.4](http://www.corestandards.org/Math/Content/8/SP/A/4/) | Whole group and small group discussionExamination of data and statistics tasks Data lesson development |
| Interpret results of data investigation and relate results to the question(s) asked. | FSEHD 1, 2, 3NCTM/CAEP 2c, 2d NCTM/CAEP addendum B.4.2RIPTS 1, 2, 5, 6, 8, 9[CCSS-M 1.MD.C.4](http://www.corestandards.org/Math/Content/1/MD/C/4/)[2.MD.D.10](http://www.corestandards.org/Math/Content/2/MD/D/10/)[3.MD.B.3](http://www.corestandards.org/Math/Content/3/MD/B/3/)[4.MD.B.4](http://www.corestandards.org/Math/Content/4/MD/B/4/)[5.MD.B.2](http://www.corestandards.org/Math/Content/5/MD/B/2/)[6.SP.A.3](http://www.corestandards.org/Math/Content/6/SP/A/3/)[6.SP.B.4](http://www.corestandards.org/Math/Content/6/SP/B/4/)[6.SP.B.5](http://www.corestandards.org/Math/Content/6/SP/B/5/)[7.SP.B.4](http://www.corestandards.org/Math/Content/7/SP/B/4/)[7.SP.C.8](http://www.corestandards.org/Math/Content/7/SP/C/8/)[8.SP.A.1](http://www.corestandards.org/Math/Content/8/SP/A/1/)[8.SP.A.2](http://www.corestandards.org/Math/Content/8/SP/A/2/)[8.SP.A.3](http://www.corestandards.org/Math/Content/8/SP/A/3/)[8.SP.A.4](http://www.corestandards.org/Math/Content/8/SP/A/4/) | Whole group and small group discussionData lesson developmentTasks and problems |
| Apply basic concepts of probability. | FSEHD 1NCTM/CAEP 1a, 2aNCTM/CAEP addendum B.4.4, B.4.5RIPTS 2, 3, 8, 9[CCSS-M 7.SP.C.5](http://www.corestandards.org/Math/Content/7/SP/C/5/)[7.SP.C.6](http://www.corestandards.org/Math/Content/7/SP/C/6/)[7.SP.C.7](http://www.corestandards.org/Math/Content/7/SP/C/7/)[8.SP.A.1](http://www.corestandards.org/Math/Content/8/SP/A/1/)[8.SP.A.3](http://www.corestandards.org/Math/Content/8/SP/A/3/) | Probability tasksWritten reflection |
| Apply the Common Core Standards for Mathematics Practice to data and statistics.  | FSEHD 2, 3, 4NCTM/CAEP 2e, 3c, 3eRIPTS 3, 5, 8, 9[CCSS-M MP1](http://www.corestandards.org/Math/Practice/#CCSS.Math.Practice.MP1)[MP2](http://www.corestandards.org/Math/Practice/#CCSS.Math.Practice.MP1), [MP3](http://www.corestandards.org/Math/Practice/#CCSS.Math.Practice.MP1)[MP4](http://www.corestandards.org/Math/Practice/#CCSS.Math.Practice.MP1)[MP5](http://www.corestandards.org/Math/Practice/#CCSS.Math.Practice.MP1)[MP6](http://www.corestandards.org/Math/Practice/#CCSS.Math.Practice.MP1)[.MP7](http://www.corestandards.org/Math/Practice/#CCSS.Math.Practice.MP1) | Whole group and small group discussionData lesson developmentTasks and problems |

| B.19. [**Topical outline**](#outline)**: Do NOT insert whole syllabus, we just need a two-tier outline** |
| --- |
| 1. What is Statistics?
	1. Variability in data“Statistical problem solving and decision making depend on understanding, explaining, and quantifying the variability in the data” (GAISE Report, 2005, p. 6)
	2. Context
	3. Common Core Standards for Mathematical Practice
2. The Problem-Solving Process in Data Analysis
3. Types of Dataa) Numerical Datab) Categorical Data
4. Variabilitya) Within a single groupb) Between Groupsc) Samples i.) Random ii.) Representative
5. Representations of Categorical Dataa) Picture Graphsb) Bar Graphs
6. Representations of Numerical or Quantitative Dataa) Line plotb) Stem and leaf plot c) Histogramd) Continuous and discrete datae) Different representations of the same data
7. Measures of Central Tendency and their usesa) Meanb) Modec) Mediand) Range
8. Probability as a tool for statistics a) Experimental Probabilityb) Theoretical Probability
 |

## 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 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 |  |  |