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

## Cover page Scroll over blue text to see further [instructions](#instructions)

|  |  |  |
| --- | --- | --- |
| A.1. [Course or program](#Proposal) | **CIS 472 Data Visualization** |  |
| [Replacing](#Ifapplicable)  |  |  |
| A.2. [Proposal type](#type) | **Course: creation**  |  |
| A.3. [Originator](#Originator) | Kyungsub Choi & Lisa Bain | [Home department](#home_dept) | SOM - ACCT & CIS Dept |
| A.4. [Rationale](#Rationale) | Required for the launch of a new Data Science Minor for the Fall 2017 semester. This new course is needed to cover the fundamentals of displaying data in formats that promote increased understanding and to instruct students how to use various data visualization software tools.1. Data Science programs typically include both computer and math courses. RIC currently has courses that cover the fundamentals of information systems as well as the required math content for the minor but not courses in data science or data visualization. Therefore, two new courses are needed. This is one of the two new courses being proposed. 2. The Data Science field one of the fasting growing sectors of the IT industry. There are many organizations requiring this skill and other institutions offering minors, bachelors and graduate studies in this area. 3. This minor will be used to establish the foundation for a future graduate program/certificate in Data Science. The intent is to cross list the course.  |
| A.5. [Date submitted](#date_submitted) | Jan 27, 2017 | A.6. [Semester effective](#Semester_effective) | Fall 2017 |
| A.7. [Resource impact](#Resource) | *[Faculty PT & FT](#faculty" \o "Need to hire new full-time or part-time faculty? This is where you indicate if this proposal will be affecting FLH in your department/program.)*:  | Faculty FT |
|  | [*Library*:](#library) | N/A |
|  | [*Technology*](#technology) | No additional technology resources will be needed. Any software requirements will be coordinated with USS, installed in the dedicated Alger 104 networking lab, or provided directly to the students.  |
|  | [*Facilities*](#facilities): | The CIS courses that are part of the minor will use the existing classrooms and computers labs.  |
| A.8. [Program impact](#prog_impact) | CIS and MATH (Due to a prerequisite of the new course) |
| A.9. [Student impact](#student_impact) | New minor available in Data Science |
| A.10. The following screen tips are for information on what to do about catalog copy until the new CMS is in place; check the “Forms and Information” page for updates. [Catalog page.](#catalog)  [Where are the catalog pages](#catalog)? [Several related proposals](#catalog)? Do **not** list catalog pages here. **All** catalog copy for a proposal must be contained within a **single** file; put page breaks between sections. Make sure affected program totals are correct if adding/deleting course credits. |

B. [NEW OR REVISED COURSES](#delete_if)

|  | Old ([for revisions only](#Revisions)) | New |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title)  |  | CIS 472 |
| B.2. Cross listing number if any |  | CIS 572 |
| B.3. [Course title](#title)  |  | Data Visualization |
| B.4. [Course description](#description)  |  | This course introduces algorithms and techniques for effective data visualizations based on data science principles, graphic and communication design, visual art, perceptual and cognitive science. Data visualization tools are introduced.  |
| B.5. [Prerequisite(s)](#prereqs) |  | CIS 352 and MATH 248 |
| B.6. [Offered](#Offered) |  | As needed  |
| B.7. [Contact hours](#contacthours)  |  | 3hrs 40mins |
| B.8. [Credit hours](#credits) |  | 4crs |
| B.9. [Justify differences if any](#differences) |  |
| B.10. [Grading system](#grading)  |  | Traditional |
| B.11. [Instructional methods](#instr_methods) |  | FtF, Hybrid, or Online |
| B.12.[Categories](#required) |  | * Required for new Data Science Minor
* New elective possible for SOM majors and other majors
* New restricted elective for CIS Majors
 |
| B.13. Is this an Honors course? |  | No |
| B.14. [General Education](#ge) |  | No |
| B.15. [How will student performance be evaluated?](#performance) |  | Exams, Quizzes, Project, Assignments, & in-class activities |
| B.16. [Redundancy statement](#competing) |  | No redundancy |
| B. 17. Other changes, if any |  |

| B.18**.** [**Course learning outcomes**](#outcomes) | [**Standard(s)**](#standards) | [**How will they be measured**](#measured)**?** |
| --- | --- | --- |
| * Understand & define the data visualization domain and its objectives
* Utilize the data science principles, graphic design, communication design, visual art, perceptual and cognitive science to analyze and visualize given data set.
* Draw a conclusion from visualized data set.
 |  | Exams, assignments, and project |

| B.19. [**Topical outline**](#outline) |
| --- |
| 1. Fundamentals of data visualization –
	1. Definitions
	2. Book review: “The Visual Display of Quantitative Information” by Tufte, Edward R.
	3. Industry Examples
2. Learning the data visualization tools –
	1. R
	2. Python
	3. Jupyter
	4. Tableau
3. Vector graphics and spatial arrangements
	1. Vector graphic attributes
	2. Shapes and paths
	3. The vector graphic building blocks
4. Tables to graphic visualization
	1. Modulating vector graphics using actual data
	2. Automating the process of data dense image generation
5. Data visualization aesthetics
	1. Line weight, color schemes
	2. Typography
	3. Scale and juxtaposition
6. Selected data visualization topics
	1. Current research studies
	2. Case study
 |

## D. Signatures

##### D.1. Approvals

* 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.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Jane Przybyla | Chair of Acct and CIS Dept |  |  |
| Jeff Mello | Dean of School of Management |  |  |

##### D.2. [Acknowledgements](#acknowledge)

| Name | Position/affiliation | [Signature](#Signature_2) | Date |
| --- | --- | --- | --- |
| Christopher Teixeira | Chair of Math and CSCI Dept |  |  |
| Earl Simson | Dean FAS |  |  |
|  |  |  | Tab to add rows |