

**California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST**

• AREA C1: Arts

See GE Handbook for information on each section of this form

VSAR 411
Area C1

ABSTRACT

Course Abbreviation and Number: <u>VSAR AMP 411</u>	Course Title: Data Visualization	
Number of Units: <u>3</u>		
College or Program: <input checked="" type="checkbox"/> CHABSS <input type="checkbox"/> CSM <input type="checkbox"/> CEHHS <input type="checkbox"/> COBA <input type="checkbox"/> Other _____	Desired term of implementation: <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring <input type="checkbox"/> Summer Year: 2016	Mode of Delivery: <input checked="" type="checkbox"/> face to face <input checked="" type="checkbox"/> hybrid <input type="checkbox"/> fully on-line
Course Proposer (please print): Lucy HG Solomon	Email: <u>lsolomon@csusm.edu</u>	Submission Date: 1/20/2016

1. Course Catalog Description:

Provides the technological tools for telling the story of information, using techniques and principles from art and design. An examination of how communicative strategies, such as flow charts, idea maps, graphics, animations, movies, and performances, can convey complex subject-specific information. Emphasizes translating data in multiple media and stretching the story-telling potential of information plotting.

2. GE Syllabus Checklist: The syllabi for all courses certified for GE credit must contain the following:

<input checked="" type="checkbox"/>	Course description, course title and course number
<input checked="" type="checkbox"/>	Student learning outcomes for General Education Area and student learning objectives specific to your course, linked to how students will meet these objectives through course activities/experiences
<input checked="" type="checkbox"/>	Topics or subjects covered in the course
<input checked="" type="checkbox"/>	Registration conditions
<input checked="" type="checkbox"/>	Specifics relating to how assignments meet the writing requirement
<input checked="" type="checkbox"/>	Tentative course schedule including readings
<input checked="" type="checkbox"/>	Grading components including relative weight of assignments

SIGNATURES

<u></u>	<u>1/20/2016</u>	<u></u>	<u>1-21-16</u>
Course Proposer	Date	Department Chair	date
<i>Please note that the department will be required to report assessment data to the GEC annually.</i>			
		DC Initial	
Support Do not support*	Support Do not support*		
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>		
Library Faculty Date	Impacted Date		
	Discipline Chair		
Support Do not Support*	Approve Do not Approve		
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>		
Impacted Discipline Date	GEC Chair Date		
Chair			

* If the proposal is not supported, a memo describing the nature of the objection must be provided.



**California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST**

• AREA C1: Arts

See GE Handbook for information on each section of this form

Course Coordinator: Lucy HG Solomon Phone 760-750-8565 Email: lsolomon@csusm.edu

Part A: C1 Arts General Education Learning Outcomes (GELOs) related to course content. [Please type responses into the tables.]

Arts GELOs this course will address:	Course content that addresses each GELO.	How will these GELOs be assessed?
C1.1 Students will describe the ways in which art informs us of issues of diversity (such as race, class and gender) in a global, national or local context.	Data visualization will include assessment of data in the contexts of race, class and gender. Data visualizations depicting societal trends and topics that intersect with issues of diversity present a forum for discussing those issues and elicit responses from students in their data interpretations. Data can be subjective: data depictions tell different stories, depending on the visualization. That subjectivity in relation to race, class and gender are examined.	Assessment is based on students' written assessments, in which students analyze data visualizations and their nuanced role within society, taking into account the sometimes subtle statements about gender, race, identity, and culture implicit within the visualization.
C1.2: Students will apply theoretical and/or critical perspective to the study of art past and present.	The course will cover how information has been conveyed over time and in different cultural contexts. Students will compare data visualizations of similar topics from different time periods and contexts.	Assessment is based on students' comparative analyses of data visualizations originating from different cultural contexts and different time periods.
C1.3: Students will recognize and explain various artistic styles from diverse cultures and peoples.	The course introduces students to the many formats and genres in which information is conveyed. The narrative of information is rich and varies across cultures and contexts.	Assessment is based on the evaluation of students' analyses of data visualization in which they discuss contrasting visualizations of data across cultures. Through these assignments students demonstrate their ability to identify and describe narrative forms of information, taking into account the contexts for the narratives.
C1.4: Students will use appropriate vocabulary to describe and analyze works of artistic expression within the historical context in which the work was created.	The data visualization analysis required in this course is a written assignment with a workshop component. With an emphasis on writing, lectures introduce students to subject-specific vocabulary and content.	Students are assessed based on the clarity of their ideas and use of subject-specific terms within the data visualization analysis.
C1.5: Articulate various theoretical principles in their analysis of works in the arts and humanities. [Methods courses]	Design theory is layered into each lecture, giving students a strong understanding of the evolution of the design principles underlining data visualization.	Assessment is based on a presentation and discussion of examples of data visualization, reflecting the student's understanding of the design principles introduced in the representation of data.
C1.6: Use relevant research methods to analyze and interpret works in the arts and humanities. [Methods courses]	The course gives students the tools to examine data visualization within multiple contexts through research and to interpret the visualization as a narrative.	The data visualization analysis assesses students' ability to research, analyze and interpret visual representations of data.

**California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST**

• AREA C1: Arts

See GE Handbook for information on each section of this form

C1.7: Students will create works of art that demonstrate facility with the key techniques of the art form in question. These courses will be taught face-to-face, rather than online. [Creative Activity Courses]	The course teaches a variety of tools and techniques for visualizing data, from graphing to abstracting to animating. Students will also produce interactive models.	This outcome is measured by students' data visualizations in a variety of media and formats.
---	--	--

Part B: General Education Learning Outcomes required of all GE courses related to course content:

GE Outcomes required of <u>all</u> Courses	Course content that addresses each GE outcome?	How will these GELOs be assessed?
Students will communicate effectively in writing to various audiences. (writing)	The course introduces students to methods of analysis used when writing about data visualization, including describing data representations in relation to social, political, and cultural contexts.	This outcome is measured by assessment of students' data visualization analyses.
Students will think critically and analytically about an issue, idea or problem. (critical thinking)	Thoughtful descriptions and critical questions are encouraged among students, who participate in a discussion forum where written responses are logged.	This outcome is measured by assessment of students' written assignments, for which they demonstrate critical thinking in their investigations into data visualization.
Students will find, evaluate and use information appropriate to the course and discipline. (Faculty are strongly encouraged to collaborate with their library faculty.)	The course involves library research specific to students' data translation projects, where they identify and interpret a body of data and "translate" this information through data visualization.	This outcome is measured by assessment of an assignment requiring data collection, interpretation and data visualization.

**California State University, San Marcos General Education Program
GENERAL EDUCATION NEW COURSE CERTIFICATION REQUEST**

• AREA C1: Arts

See GE Handbook for information on each section of this form

Part C: GE Programmatic Goals: *The GE program aligns with CSUSM specific and LEAP Goals. All C1 courses must meet at least one of the LEAP Goals.*

GE Programmatic Goals	Course addresses this LEAP Goal:
LEAP 1: Knowledge of Human Cultures and the Physical and Natural World.	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes
LEAP 2: Intellectual and Practical Skills	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes
LEAP 3: Personal and Social Responsibility	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes
LEAP 4: Integrative Learning	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes
CSUSM Specific Programmatic Goals	Course content that addresses the following CSUSM goals. Please explain, if applicable.
CSUSM 1: Exposure to and critical thinking about issues of diversity.	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (please describe): This course places data visualization in its many contexts. Lectures address the socioeconomic, gender, cultural, and social perspectives presented in graphic representations and depicted by the datasets themselves.
CSUSM 2: Exposure to and critical thinking about the interrelatedness of peoples in local, national, and global contexts.	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (please describe): This course examines data visualization as a form of cross-cultural communication. Data visualization is a tool that can effectively translate information that is highly specialized or difficult to comprehend into an approachable narrative.

Part D: Course requirements to be met by the instructor.

Course Requirements:	How will this requirement be met by the instructor?
Course meets the All-University Writing requirement: A minimum of 2500 words of writing shall be required in 3+ unit courses,	The writing requirement will be fulfilled by the following writing assignments: writing responses to course discourse in discussion forum, reading assessment, data visualization comparative analysis, and article discussion.
Assessment of student learning will take a multitude of forms, including writing assignments, exams, discussion, and creative projects and performances.	Assessment of student learning for this course is initially measured by the students' analyses, their written responses and data visualization projects. Assessment and evaluation are ongoing and will entail revisions in the above.

California State University, San Marcos | School of Arts

Course Number ~~AMD~~ 411

Course Title ~~vSAR~~ Data Visualization

| Draft Syllabus

I. Course Description

Provides the technological tools for telling the story of information, using techniques and principles from art and design. An examination of how communicative strategies, such as flow charts, idea maps, graphics, animations, movies and performances, can convey complex subject-specific information. Emphasizes translating data in multiple media and stretching the story-telling potential of information plotting.

II. Student Learning Objectives for General Educational Area

Upon successful completion of the course, students should be able to:

- Communicate effectively in writing to various audiences
This outcome is measured by assessment of students' data visualization analyses.
- Think critically and analytically about an issue, idea or problem
This outcome is measured by assessment of students' data visualization journal, in which they demonstrate critical thinking in their investigations into ways that information is depicted, based on the originator's position on a subject.
- Find, evaluate and use information appropriate to the course and discipline
This outcome is measured by data visualization assignments requiring data collection, data interpretation and, ultimately, data visualization.

Student Learning Objectives for the course

Upon successful completion of the course, students should be able to:

- Understand and apply principles of data visualization
This outcome is measured by assessment of students' data visualizations.
- Acquire, parse, and analyze abstract data sets
This outcome is measured by students' data visualization statements.
- Design custom data visualizations of subject-specific material
This outcome is measured by assessment of students' data visualization projects.
- Analyze existing visualizations with regard to information and societal narratives
This outcome is measured by assessment of students' data visualization analyses.

III. Topics / Schedule

The following is a list of course topics and weekly schedule.

- **Week 01:** Course Introduction, Terminology
- **Week 02:** Basic Charts and Plots, Multivariate Data Visualization
- **Week 03:** Principles of Perception, Color, Design, and Evaluation
- **Week 04:** Text Data Visualization
- **Week 05:** Interactivity and Animation
- **Week 06:** Temporal Data Visualization
- **Week 07: MIDTERM EXAM**
- **Week 08:** *Spring Break, No Classes*
- **Week 09:** Geospatial Data Visualization
- **Week 10:** Visualization Case Studies
- **Week 11:** Redesign Principles and Design Dimensionality
- **Week 12:** Hierarchical Data Visualization
- **Week 13:** Network Data Visualization
- **Week 14: FINAL PROJECT**
- **Week 15:** Project Prototype Demonstrations
- **Week 16:** Ethics and Aesthetics
- **Finals Week:** Final Project Poster Session

IV. Registration Restrictions.

This is an upper division elective and there are no registration restrictions.

V. Writing Requirement

The writing requirement will be fulfilled by the following writing assignments: information journal (entries on on-line viewing and data visualization creations), reading assessment, data visualization analysis, and article discussion.

VI. Texts

Now You See It, chapters 1-3

S. Card, J. Mackinlay and B. Shneiderman, *Readings in Information Visualization, Using Visualization to Think* Morgan Kaufmann, 1999, pp. 1-34.

Additional Papers

S. K. Card, "Information visualization." In *The Human-Computer Interaction Handbook*, J. Jacko, A. Sears, (editors), Lawrence Erlbaum Associates, 2003.

J.-D. Fekete, J. van Wijk, J. Stasko, C. North, "The Value of Information Visualization", in *Information Visualization: Human-Centered Issues and Perspectives*, (Editors: A. Kerren, J. Stasko, J.-D. Fekete, C. North), Springer, 2008, pp. 1-18.

C. North, "Information Visualization", in *Handbook of Human Factors and Ergonomics*, G. Salvendy (editor), John Wiley & Sons, 2005.

VII. Grading Components and Assignment Weight

Students will be evaluated based on participation as well as on assignments and collaborative assignments, as well as a mid-term and final.

Graded items include:

Data Visualization Assignments	20%
Article Discussion	5%
Reading Assessment	10%
Data Visualization Analysis	15%
Data Visualization Journal	15%
Poster Session	15%
Final Project	20%
Total	100%