Course Approval Form

For instructions see:
http://registrar.gmu.edu/facultystaff/catalog-revisions/course/

Action Requested:

- [x] Create new course
- [ ] Inactivate existing course
- [ ] Modify existing course (check all that apply)
  - [ ] Title
  - [ ] Credits
  - [ ] Repeat Status
  - [ ] Grade Type
  - [ ] Prereq/coreq
  - [ ] Schedule Type
  - [ ] Restrictions
  - [ ] Other:

Course Level:

- [ ] Undergraduate
- [x] Graduate

College/School: College of Science
Department: CDS
Submitted by: D. Papaconstantopoulos
Ext: 3-3624
Email:
Subject Code: CDS
Number: 502
(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Effective Term:

- [x] Fall
- [ ] Spring
- [ ] Summer

Year 2016

Title:
Current:
Banner (30 characters max w/ spaces): Scientific Data and Databases
New: Scientific Data and Databases

Fulfills Mason Core Req? (undergrad only)

- [ ] Currently fulfills requirement
- [ ] Submission in progress

Credits: (check one)

- [x] 3 Fixed — or
- [ ] Variable — to

Repeat Status: (check one)

- [x] Not Repeatable (NR)
- [ ] Repeatable within degree (RD) — Maximum credits allowed:
- [ ] Repeatable within term (RT)

Grade Mode: (check one)

- [x] Regular (A, B, C, etc.)
- [ ] Satisfactory/No Credit
- [ ] Special (A, B C, etc. +IP)

Schedule Type: (check one) LEC can include LAB or RCT

- [x] Lecture (LEC)
- [ ] Independent Study (IND)
- [ ] Lab (LAB)
- [ ] Seminar (SEM)
- [ ] Recitation (RCT)
- [ ] Studio (STU)
- [ ] Internship (INT)

Prerequisite(s): CDS 130 or CDS 101; or permission of instructor

Corequisite(s):

Instructional Mode:

- [x] 100% face-to-face

Restrictions Enforced by System: Major, College, Degree, Program, etc. (include code)

Equivalencies: (check only as applicable)

- [ ] YES, course is 100% equivalent to:
- [ ] YES, course is being renumbered to/will replace the following:

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	**Notes** (List additional information for the course)
Data and databases used by scientists. Includes basics about database organization, queries, and distributed data systems. Student exercises will include queries of existing systems, along with basic design of database systems. Examples from different disciplines will be given.	

Indicate number of contact hours: Hours of Lecture or Seminar per week: 3 Hours of Lab or Studio:

When Offered: (check all that apply)

- [x] Fall
- [ ] Summer
- [x] Spring

Approval Signatures

Department Approval Date

College/School Approval Date

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Graduate Courses Only

Graduate Council Member

Provost Office

Graduate Council Approval Date

For Registrar Office's Use Only: Banner_____Catalog_____

revised 6/22/15

Course Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference. Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

FOR ALL COURSES

Course Number and Title: CDS 512- Scientific Data and Databases

Date of Departmental Approval: 09/03/2015

FOR INACTIVATED/REINSTATED COURSES **N/A**

FOR MODIFIED COURSES **N/A**

FOR NEW COURSES

- Reason for the New Course: To provide these course topics at the graduate level. This new course will frequently be cross-listed with CDS 302- Scientific Data and Databases.
- Relationship to Existing Programs: A lower-level graduate course in scientific data and databases that can be within reach of graduate students outside of the CDS department (the only other graduate courses that cover this subject are at the 600-level and above which are quite challenging for students outside of CDS's MS or PhD programs).
- Relationship to Existing Courses: Similar to CDS 302, but with graduate-level expectations.
- Semester of Initial Offering: Fall 2016

CDS 502
SCIENTIFIC DATA AND DATABASES

-- SYLLABUS --

Prerequisites: MATH 125, STAT 354 or permission of instructor
Credits: 3
Instructor: TBD
Office Hours: TBD

Course Description:
This course will introduce databases, data concepts, and object-oriented data management. The first part of the course will present personal databases and commercial level databases including schema construction, query languages, complex query structures, database management and database programming. The second part of the course will review components of a programming language (Python, C++, Java or equivalent) for three purposes. The first is to create the ability to seamlessly employ database queries into client side programming, the second is to explore object-oriented data structures, and the third is to create a web-based interactive interface for clients.

Lecture Content:

- Spreadsheets and Data Sets
- Database Ideology, Personal Databases
- Creating Databases and Tables, Schema Design, Language of Databases
- Simple queries, SQL Commands, Data Types and Sorting
- Complicated Queries
- Views and SQL Programming
- Introduction to a sequential programming language (Python, C++, Java, or equivalent), Connecting to MySQL
- Object-Oriented Programming and Object-Oriented Data Management
- GUI Interface
- CGI and an Introduction to HMTL
- Link Analysis
- Issues in Data Fusion
- Student Presentations

Homework:

Students will use on-line and computational resources to explore database queries, data management, algorithms and user interfaces.

Project:
A semester project will allow the student to personally explore a single topic in data management and database queries. Students will deliver short oral presentations of their project to the class.

Exams:

Midterm and final exams will be given, based on the content of the lectures and the homework assignments. Short essays as well as analytic calculations about problem complexity, time, and simple examples from programs will be used.

Grades:

Homework (25%), Projects (15%), Midterm (30%), Final Exam (30%)

Required Text:

. R. T. Watson, Data Management: Databases & Organizations,
5th Edition, Wiley, 2005.