

## GEOG657 Web Programming Spring 2016

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Online office hours : Mondays 8– 9pm  
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Lecture: Mondays 5:30 - 8:00pm  
Online & On-campus LeFrak 1166  
Lab: Tuesdays 5:30-7:30 pm  
Online & On-campus LeFrak 1166  
Website : <http://elms.umd.edu>  
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### Description

The growing capability and use of the Internet has created a demand for GIS application on the Web. Component-based web server design and efficient session and secure access management have become challenges to provide fast, robust, and flexible GIS services on the Internet. This course is designed to teach fundamental techniques required in developing both client-side and server-side web applications for not only GIS but also non-GIS applications. This course covers web design and static web generation using HTML5 and CSS, client-side programming with JavaScript, and dynamic web development using PHP and MySQL. This course also introduces object-oriented programming in PHP. MySQL and Structured Query Language are used to design and handle data for web applications.

The format of this course will consist of lectures, lab assignments, readings, and a final program. The lectures will be presented online via the Live Classroom on the Adobe Connect. All lectures involve the interaction between students and instructor in real-time. Lectures will be archived into videos which will be made available on the Enterprise Learning Management System (ELMS). Please note that video archives are intended for occasional or backup use in case students have to miss lectures due to personal, business, or medical reasons. Real-time, online participation is strongly recommended. The readings and lab assignments will also be posted on ELMS.

### Learning Outcomes

The specific objectives of this course are that students are expected to learn the following:

- Have an understanding about the Internet and various Web applications
- Exposed to popular programming languages and techniques used on the Web
- Can design and develop static Web sites using HTML5 and CSS
- Have an understanding of object-oriented programming with PHP
- Be able to publish interactive and data driven Web pages using PHP
- Know the use of SQL to handle data from databases
- Can build ArcGIS application with PHP and Google Map APIs
- Can develop client-side processing in JavaScript working together with server-side processing

**Prerequisites**

GEOG676 Programming for GIS is pre-requisite, or you should have a minimum of programming experience with Python or other programming languages. Web programming using HTML, XHTML, CSS, etc. will be helpful, but not required.

**References** (No Textbook Required)

**RN:** Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic Websites by Robin Nixon, O'Reilly Media Inc, 4<sup>th</sup> Edition, 2014

**WT:** PHP and MySQL Web Development by Luke Welling and Laura Thomson, 4th Edition, Addison-Wesley, 2008 – 5<sup>th</sup> Edition will be published on June 2016

**W3:** *W3Schools online web tutorial*, <http://www.w3schools.com/>

**GM:** Google Maps API <https://developers.google.com/maps/>

ArcGIS Resource Center Web API, <https://developers.arcgis.com/javascript/>

**Course Requirements and Grading**

It is strongly encouraged to attend each lecture and actively participate in online discussion board as well as in class. Students are required to post a reply on the issue posted by the instructor. Lab assignments will be given on a weekly basis to help students gain practical experience in developing websites. Students need to complete final projects to design and implement dynamic websites using PHP and Database Server (MySQL). Final grades will be determined by the following items:

- Weekly discussions and participation            5 %
- Lab assignments    55 %
- Quizzes    10 %
- Final project     30 %

The plus/minus grading system will be used to assign student grades. Minor adjustments to this scale might be made based on the performance of the class as a whole.

97-100 = A+

94-96.99 = A

90-93.99 = A-

87-89.99 = B+

84-86.99 = B

80-83.99 = B-

77-79.99 = C+

74-76.99 = C

70-73.99 = C-

67-69.99 = D+

64-66.99 = D

60-63.99 = D-

<60 = F

**Software Requirements for Web Programming**

- WAMP Server (<http://www.wampserver.com>). WAMP Server is a free all-in-one package to install all of Apache Web Server, PHP, and MySQL in once on Windows.

- MAMP (<http://www.mamp.info/en/downloads/>). MAMP Server is a free all-in-one package to install all of Apache Web Server, PHP, and MySQL in once on Mac OS X.
- Aptana Studio 3 (<http://www.aptana.com/products/studio3/download>), Aptana Studio is a free text editor.
- FTP software: we recommend WinSCP (Secure FTP) for PC and Fetch for Mac. Both of these are free downloads from <http://terpware.umd.edu/>

All students must have a UMD TerpConnect (used to be Glue) account to obtain permissions to upload HTML and CSS files to your personal account in <http://terpconnect.umd.edu>. Students will be able to use Aptana Studio, Apache, PHP, MySQL servers, MS Visual Studio available in the remote Hyperion server (129.2.24.163). All assignments should be saved in your personal directory in the remote Web server and run on the server. Details about the web server will be provided in the class and posted in the Announcements.

## **Communication**

### *Email*

Both the TA and the instructor will always be available by email. Use the email link in the sidebar to send us an email at any time. We will try to answer within 24 hours and usually sooner.

### *Online / Chatroom Office Hours*

If needed, I can provide online office hours if you are unable to meet on campus. To do so, simply send me an e-mail to request a time to meet online.

### *Offline / On-campus Office Hours*

I will be available to meet on campus for face-to-face office hours at specified times. You can also email either the TA or the instructor to set up individual office hours by appointment.

### *Discussion Board*

The discussion board is a place on the ELMS site for you to visit your classmates. This is an open forum for discussion about course material and for casual conversation. We encourage any general questions about the course material or lab assignments to be posted here so that students can help learn from each other. We will try to help answer any course-related questions that are posted here. In addition, there will be study rooms set up for you to form study groups. We will not be monitoring these rooms. Remember that the University Code of Academic Integrity specifies that you are free to work together and to discuss the assignments, but that you must produce your own original and independent work.

## **Class Attendance and Environment**

You are strongly recommended to attend every lecture in real time at the online site or on campus at the physical classroom. We will meet online at the announced time for a live audio/video lecture. During this time you can follow along with the lecture and ask any questions that you may have. The lecture will be archived for anyone who absolutely must miss a class, but I encourage you to join the class online at the appointed time so that you can ask questions and keep up with the course schedule.

In this class, students will meet in a virtual space online which will be treated as a classroom. Our class will meet within the Enterprise Learning Management System (ELMS), the university's online learning system. Go to <http://elms.umd.edu> to access the course. After login, the course will be listed in the right column under "My Courses".

It is important to recognize that the classroom is an environment that requires respect for all participants. Therefore, students are expected to conduct themselves in a considerate manner.

### Make-up Policy

Assignments must be turned in by 11:59PM at which they are due. Late assignments will result in penalties unless prior arrangements are made with the instructor. If you have a documented disability and wish to discuss academic accommodations, please contact the instructor immediately. Students should not expect 'Incomplete' grade as they will be only given under extra-ordinary circumstances.

### Academic Integrity

The University of Maryland, College Park, has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student, you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.shc.umd.edu>.

Within our class, students may work together to review class notes and home assignments. However, assignments must be done individually. Each student must turn in his or her own work, from his or her own computer. Any discussion or problem solution must be his or her alone, without assistance from any other person.

### Disabilities and Religion

Any student with a disability is encouraged to meet with the instructor privately during the first week of class to discuss accommodations. I will make every effort to accommodate students who are registered with the Disability Support Services (DSS) Office and provide a DSS accommodation form. Please refer to the Online Undergraduate Catalog Policy on Religious Observance.

### Sustainability

In an effort to promote greater understanding of sustainability among students, faculty, and staff at the University of Maryland, this course has been adapted to include discussion about larger sustainability issues, such as global climate change, food security, and systems modeling. Visit the University of Maryland's office of sustainability at: <http://www.sustainability.umd.edu/>.

### Course Schedule

This is a tentative schedule and may be adjusted to suit our class. Changes will be announced and posted on Blackboard.

Dates	Topics	Contents	Reading	Assignment
Feb 29 Mar 1	Course Introduction HTML /XHTML	Overview of the Internet and the World Wide Web Basic HTML/XHTML Basic CSS (Cascading Stylesheet)	W3: HTML & CSS tutorial RN:18	Lab 1 Out
Mar 7 Mar 8	HTML	More HTML/XHTML More CSS	W3: HTML & CSS tutorial RN: 18	Lab 1 Due Lab 2 Out

Mar 14 Mar 15		Spring Break		
Mar 21 Mar 22	HTML5 JavaScript	Introduction to JavaScript JavaScript DOM, JSON HTML5 Google Maps JavaScript API	W3: HTML5 JavaScript tutorial RN:13, 14, 15	Lab 2 Due Lab 3 Out Quiz 1 Out
Mar 28 Mar 29	JavaScript	HTML Forms Responsive Web Design Bootstrap	W3: JSON, JavaScript RN: 17	Lab 3 Due Lab 4 Out
Apr 4 Apr 5	PHP	Introduction to PHP Processing Form Data in PHP	W3: HTML, PHP RN: 1,2,3,6,11	Quiz 1 Due Lab 4 Due Lab 5 Out
Apr 11 Apr 13	PHP	Functions Object-oriented PHP Working with Files in PHP Sending emails in PHP	W3: PHP RN: 5,7	Lab 5 Due Lab 6 Out Final Project Proposal Out
Apr 18 Apr 19	PHP MySQL	Databases Basics Structured Query Language (SQL) MySQLwith PHP phpMyAdmin	W3: PHP RN: 8, 9, 10	Lab 6 Due Lab 7 Out
Apr 25 Apr 26	PHP Security Management	Date/Time Functions and Classes in PHP Date/Time Functions in MySQL Generating Images in PHP	IS 16 MM Ch 8, 19, 20	Lab7 Due Quiz 2 Out Final Project Proposal Due
May 2 May 3	PHP	Cookie Session Authentication	W3: PHP	
May 9 May 10	JavaScript	More on JavaScript framework: AJAX, Dojo, JQuery, etc. Web Services JavaScript APIs Review & Q/A	W3: AJAX, jQuery	Quiz 2 Due Final Project Due