Department of Applied Information Technology
The Volgenau School of Information Technology & Engineering
IT 410 Java Web Programming
Spring 2016

Syllabus

This is a distance learning course offered via Blackboard Learn 9.1 at http://mymason.gmu.edu. This course:
- is "asynchronous": does not usually require student participation at a particular time of day.
- is not "self-paced" or independent study. You’ll work through the course with interaction from the professor and other students, participating actively in virtual class activities, and submit assignments according to deadlines set by the professor.
- is flexible: you may fit your coursework into other activities of your semester, but expect to spend several hours each week on the course.
- requires self-discipline: you'll need to make regular time each day during the course to participate actively in class, by checking your Mason email account and the course Blackboard site, completing homework, and participating in other asynchronous class activities. Plan to devote at least the amount of time you would to a campus-based class, including class meetings.

In order to really understand the material, it is absolutely necessary for you to be actively involved. You need to view the posted videos and read the posted material, work through the assignments, and participate in online activities with each other as assigned to check your knowledge. You need to keep up with the class schedule and to understand the material in one learning module before moving on to the next.

Technical Requirements
Aside from exams, you may work at any location on your own computer. You will need an Internet-connected computer, capable of running the current versions of Java and NetBeans (see http://java.sun.com/javase/downloads/netbeans.html for platforms) and the Adobe Flash Player (see http://get.adobe.com/flashplayer/otherversions/). The software required for this course is available by free download; see the Getting Started module for setup instructions. Other requirements include a Web browser and speakers. An optional microphone or headset will allow you to communicate via voice.

Exam Logistics
This class is mostly a hands on programming class hence the exams will be a take home project. However, you will have to present your work to the class and the instructor.

Prerequisites
The prerequisite for this course is IT 206 Object Oriented Techniques for IT Problem Solving. A grade of "C" or better must be achieved in the prerequisite course before a student is qualified to take this course. The prerequisite course must be completed prior to, not concurrently with, this course.
This requirement will be strictly enforced. Any student who does not meet the prerequisite requirement will be dropped from the course by the instructor at the start of the semester and the student will be responsible for any consequences of being dropped. In addition, strong Java programming experience is required to realize full benefit of this class.

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**Rationale**

In today’s information age, it is common to observe an application user interface built using the web browser such as Internet Explorer. These interfaces are built using web development tools such as HTML, CSS, and JavaScript. It is relatively easier to build static content web applications but one needs sophisticated development frameworks for building data driven web applications. There are a number of open source frameworks built using Java that help the development of enterprise class web applications. This course teaches students how to use some of these frameworks for building these web sites. It teaches students about the layers of the n-tier architecture such as User Interface tier, Business tier, and Persistence tier. Students will be taught to build web applications using available frameworks at each tier, such as Java Server Faces and Servlets for building the UI tier. Web Services for building the business tier, and Java Persistence API (JPA) for building the persistence tier.

**Objectives**

On successful completion of this course, students will be able to:

- Understand various tiers of the n-tier application architecture
- Develop User Interface (UI) tier using Java Server Pages and Servlets and explore Java Server Faces for building sophisticated web interfaces
- Develop both SOAP and REST based web services for developing business tier logic
- Develop data persistence layer using JPA

**References**

**Textbooks**

The instructor will provide the material

In addition, the students are strongly encouraged to refer to Java EE documentation on Oracle web site: http://docs.oracle.com/javaee/6/tutorial/doc/javaetutorial6.pdf

**Faculty and Staff**

Instructors:
Grading

Grades will be awarded in accordance with the GMU Grading System for undergraduate students. See the University Catalog under Grading System for more information.

There are a total of 13 sessions and some topics may span multiple sessions. The syllabus will be divided into 10 modules and there will be an assignment for each module. In addition there will be in class activities worth 5 points and an assignment worth 20 points, for a total of 25 points per module.

Unless otherwise noted, assignments may be submitted up to 48 hours late with a 20% reduction in grade. Work submitted over 48 hours late will receive a grade of 0. In class activities are due the same day.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
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<tbody>
<tr>
<td>Weekly in class Activities (10 modules, 5 points each)</td>
<td>50</td>
</tr>
<tr>
<td>Eight Assignments (25 points each)</td>
<td>200</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
<tr>
<td><strong>Course Total</strong></td>
<td><strong>450</strong></td>
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</tbody>
</table>

Your grade will be assigned based on your total points earned as a percentage of the total points available:
<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>97-100</td>
<td>A+</td>
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<tr>
<td>93-96</td>
<td>A</td>
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<tr>
<td>90-92</td>
<td>A-</td>
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<tr>
<td>87-89</td>
<td>B+</td>
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<tr>
<td>83-86</td>
<td>B</td>
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<tr>
<td>80-82</td>
<td>B-</td>
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<tr>
<td>77-79</td>
<td>C+</td>
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<tr>
<td>73-76</td>
<td>C</td>
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<tr>
<td>70-72</td>
<td>C-</td>
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<tr>
<td>60-69</td>
<td>D</td>
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<tr>
<td>0-59</td>
<td>F</td>
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Raw scores may be adjusted by the Instructor to calculate final grades. Adjustment of raw scores is not guaranteed.

Final grades will be posted to PatriotWeb, which is the only vehicle for students to obtain their grades. A student with a "hold" on his or her PatriotWeb account will be unable to access final grades until the hold has been removed by the Registrar.

**Schedule**

This course is structured in terms of weekly modules. Each week begins on a Sunday and ends on a Saturday.

This schedule is tentative and is subject to change.

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Chapter(s)</th>
<th>Topic(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/25 - 1/31</td>
<td>Present the n-tier application architecture</td>
<td>Present the JEE technology stack and map them to various tiers</td>
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<td>Configure Glassfish and NetBeans</td>
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<td></td>
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<td>Develop a sample web application</td>
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<tr>
<td>2</td>
<td>2/1 - 2/7</td>
<td>Deep dive into Servlets and JSPs development</td>
<td>Present the servlet methods (GET, POST)</td>
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<td>Present request forwarding and redirecting</td>
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<td>Present Servlet filters</td>
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<td>Present how servlets are developed, packaged and deployed</td>
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<tr>
<td>3</td>
<td>2/8 - 2/14</td>
<td>Present MVC design pattern and how Java Server Faces framework enable developing enterprise web applications</td>
<td>Present View component development</td>
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<td>Present the controller and how it can be configured using the selected framework</td>
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<tr>
<td>IT 410</td>
<td>Spring 2016</td>
<td>Syllabus</td>
<td></td>
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</table>
|   |   | Present the model objects  
|   |   | Present data validation  
|   |   | Present simple controls such as labels, text boxes, and buttons  
|   |   | Present data submission from forms to service tier for processing  
|   |   | Discuss the usage of radio buttons  
|   |   | Discuss the usage of List boxes / Combo Boxes  
|   |   | Discuss the usage of Check boxes  
|   |   | Discuss the usage of Text Areas  
|   |   | Discuss the usage of Data Grid Control  
|   |   | Discuss the usage of Menus  
| 5 | 2/22 - 2/28 | Explore slider, spinner, Multi-select checkbox control  
|   |   | Discuss AJAX features of Prime Faces framework  
|   |   | Discuss auto complete features  
| 6 | 3/1 - 3/7 | Mid Term Exam  
| 7 | 3/8 - 3/14 | Present developing Facelets (reusable layouts) with JSF.  
|   |   | Present data validation with PrimeFaces  
|   |   | Present composite component development with JSF.  
| 8 | 3/15 - 3/21 | RESTful Web Services fundamentals  
|   |   | Data marshalling and Un-marshallding  
|   |   | Discuss output formats (XML, JSON)  
| 9 | 3/22 - 3/28 | Develop RESTful Web Services using Apache CXF  
|   |   | Discuss JSON and XML formats for data exchange  
|   |   | Securing RESTful Web Services  
| 10 | 3/29 - 4/4 | Developing client for accessing RESTful Web Services  
|   |   | Integrating web applications with RESTful web Services  
| 11 | 4/5 - 4/11 | SOAP Protocol and WSDL development  
|   |   | Discuss top down approach for developing Web Services  
|   |   | Discuss bottom up approach for developing Web Services  
| 12 | 4/12 - 4/18 | Develop Web Services using SOAP and Apache CXF  
|   |   | Securing SOAP based Web Services  
| 13 | 4/19- 4/25 | Developing SOAP clients  
|   |   | Integrating web applications with SOAP Web Services  
| 14 | 4/26 - 5/2 | JPA fundamentals  
|   |   | Developing Model objects and ORM tools  
|   |   | Developing data persistence with JPA  
| 15 | 5/3 – 5/9 | Final Review  
| 16 |   | Final Exam Tuesday, May 9, 6:00 PM - 9:00 PM, location TBA  

This syllabus is subject to revision. Changes will be announced on the course Blackboard site at [http://mymason.gmu.edu/](http://mymason.gmu.edu/).
Important Dates

- **Last day to add classes**: January 26
- **Last day to drop with no tuition penalty**: January 26
- **Last day to drop with 33% penalty**: February 2

Please refer to [http://registrar.gmu.edu/calendars/spring-2016/](http://registrar.gmu.edu/calendars/spring-2016/) the URL for full details.

Religious Holidays

A list of religious holidays is available on the [University Life Calendar page](http://registrar.gmu.edu/calendars/spring-2016/). Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor at least 2 weeks in advance of the conflict date in order to make alternative arrangements.

Attendance Policy

Students are expected to attend each class, to complete any required preparatory work (including assigned reading – see **Schedule** above) and to participate actively in lectures, discussions and exercises. As members of the academic community, all students are expected to contribute regardless of their proficiency with the subject matter.

Students are expected to make prior arrangements with Instructor if they know in advance that they will miss any class and to consult with the Instructor as soon as possible if they miss any class without prior notice. Any student who expects to miss more than one class session is strongly advised to drop the course and take it in a later semester when he/she can attend every class.

Departmental policy requires students to take exams at the scheduled time and place, unless there are truly compelling circumstances supported by appropriate documentation. Except in such circumstances, failure to attend a scheduled exam will result in a score of zero (0) for that exam, in accordance with [Mason policy on final exams](http://registrar.gmu.edu/calendars/spring-2016/). Students should not make travel plans or other discretionary arrangements that conflict with scheduled classes and/or exams. If the University is closed due to weather or other unforeseen conditions, final exams may be rescheduled – students are strongly advised not to make plans that would prevent them from attending exams that may be rescheduled during the entire exam period.
Classroom conduct

Students are expected to conduct themselves in a manner that is conducive to learning, as directed by the Instructor. Any student who negatively impacts the opportunity for other students to learn will be warned – if disruptive behavior continues, the student will be asked to leave the classroom.

Electronic devices are potential distractions in the classroom environment. Cell phones, pagers and other handheld devices must be turned off or set to "silent" mode and not used while class is in session. Laptop computers and similar devices may be used only if such use is directly related to the classroom activity in progress – for some activities the Instructor may require that such devices not be used in order to maximize student engagement.

Communications

Registered students will be given access to a section of the Blackboard Learning System for this course. Blackboard will be used as the primary mechanism (outside of lectures) to disseminate course information, including announcements, lecture slides, homework and other assignments, and scores for homework and exams.

Communication with the Instructor on issues relating to the individual student should be conducted using Blackboard Mail, Mason e-mail, via telephone, or in person - not in the public forums on Blackboard. Mason e-mail is the preferred method – for urgent messages, you should also attempt to contact the Instructor via telephone. Federal privacy law and Mason policy require that any communication with a student related in any way to a student's status be conducted using secure Mason systems – if you use e-mail to communicate with the Instructor you MUST send messages from your Mason e-mail account.

Lecture slides are complements to the lecture process, not substitutes for it - access to lecture slides will be provided in Blackboard as a courtesy to students provided acceptable attendance is maintained.

All course materials (lecture slides, assignment specifications, etc) are published on Blackboard in Adobe® Portable Document Format (PDF). This allows users of most computing platforms to view and print these files. Microsoft® Word (or a compatible word processing application) is required for preparing assignments – it is available on computers in the Mason open labs.

Privacy

Instructors respect and protect the privacy of information related to individual students.

As described above, issues relating to an individual student will discussed via email, telephone or in person. Instructors will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student.
Assessable work other than final exams will be returned to individual students directly by the Instructor (or by a faculty or staff member or a Teaching Assistant designated by the instructor, or via another secure method). Under no circumstances will a student's graded work be returned to another student.

Faculty and staff will take care to protect the privacy of each student's scores and grades.

**Disability Accommodations**

The Office of Disability Services (ODS) works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with ODS as soon as possible and take advantage of the services offered.

Accommodations for disabled students must be made in advance – ODS cannot assist students retroactively, and at least one week's notice is required for special accommodations related to exams. Any student who needs accommodation should contact the Instructor during the first week of the semester so the sufficient time is allowed to make arrangements.
Honor Code

All members of the Mason community are expected to uphold the principles of scholarly ethics. Similarly, graduating students are bound by the ethical requirements of the professional communities they join. The ethics requirements for some of the communities relevant to Applied IT graduates are available via the following links:

- ACM Code of Ethics and Professional Conduct
- IEEE Code of Ethics
- EC-Council Code of Ethics

On admission to Mason, students agree to comply with the requirements of the Mason Honor System and Code\(^1\). The Honor Code will be strictly enforced in this course. Honor Code cases are heard by a panel consisting of students – students who meet the requirements are encouraged to nominate themselves to serve on the Honor Committee.

Any use of the words or ideas of another person(s), without explicit attribution that clearly identifies the material used and its source in an appropriate manner, is plagiarism and will not be tolerated. The Instructor reserves the right to use manual and/or automated means (including such services as Turnitin.com) to detect plagiarism in any work submitted by students for this course, and to direct Teaching Assistants and/or other faculty and/or staff members to do likewise in support of this course.

For this course, the following requirements are specified:

- All assessable work is to be prepared by the individual student, unless the Instructor explicitly directs otherwise.
- All work must be newly created by the individual student for this course for this semester. Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the instructor.
- Students should not copy source code from internet sites for completing their homework. They can research the solution for the problem using the internet.

Students may seek assistance with assigned work (and are encouraged to do so if they feel the need), provided:

- The directions for the assigned work do not prohibit such assistance.
- Such assistance is acknowledged in the submitted work, clearly identifying the person(s) giving assistance and the nature of the assistance given.

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\(^1\) Available at [www.gmu.edu/catalog/apolicies](http://www.gmu.edu/catalog/apolicies) and related Mason Web pages.
Any work to be submitted is prepared entirely and exclusively by the student submitting it. Students are expressly prohibited from sharing any assessable work for this course in any manner with other students (except students assigned as Teaching Assistants or Undergraduate Peer Mentors to this course and the student's section), unless all students involved have had their work graded and returned by the Instructor, or the Instructor has explicitly approved such sharing.