

TCOM 616– Scalable Network Architecture

Department of Electrical and Computer Engineering
George Mason University
Spring 2021

Syllabus (revised 2020-December 28)

Administrative Information

Instructor: **Jeremiah D. Lawson**
Email: jlawso5@gmu.edu Subject = GMU-TCOM 616
Phone: 210-775-8996
Office hours: By appointment
Teaching Assistant: N/A
Classes: Friday 4:30 pm – 7:10 pm
Location: Online
Lectures will be held using Zoom.

Course Description

TCOM 616 - Scalable Network Architecture

Prerequisites: TCOM 514, TCOM 515 and TCOM 535.

**This course assumes you are already familiar with routing and switching concepts.

This course covers concepts and protocols associated with designing highly available and scalable networks on the cloud. Topics include server class operating systems and their application in Internet and enterprise deployments, techniques used to support an enterprise cloud network, networking in virtualized environments and fundamentals of cloud computing. Course also includes exercises and lab work that applies concepts learned throughout the course.

Textbooks

AWS Certified Solutions Architect Official Study Guide: Associate Exam 3rd Edition

Available in Blackboard in the Course Content

Grading

The grade for the course is determined from a calculation of points on a 0 to 100-point scale, which will be assessed on the following components:

Homework / Labs	40%
Mid-Term Exam	20%
Final Exam	20%
Participation	20%

Lab/Exercises

Labs are conducted using an AWS free tier account and submitting screenshots. Not all services used are free. Although charges should be minimal, it is suggested to clean up environment after each set of labs to keep charges from adding up.

*You are responsible for your own account and its use. George Mason University nor any of its staff assumes any liability or responsibility for anything you do with your account or any charges that you may incur.

Class Participation

Participation points are earned by attending class and completing the exercises the week they are assigned. There are 13 Lectures and 13 Chapter Exercise Assignments this semester. Each Lecture attended is worth 5 participation points. For Chapter Exercises, there are two due dates given. The Exercises will be demonstrated at the end of each Lecture. If the Exercises are completed and turned in by End of Day the Saturday at the end of the next week following that Lecture, it will add 10 participation points.

For example, Chapter 1 Exercises will be demonstrated the end of the Lecture of Week 1. If it is completed and turned in by End of Day the Saturday at the end of Week 2, then the participation points will be added. The assignment can be turned in up until the end of the Mid-Term week for normal grading, but no participation points will be added if turned in after that Week 2 deadline.

Mid-Term Exams

The mid-term exam will be taken online, using Blackboard, and will cover material discussed up until exam date.

Final Exam

The final exam will be taken online, using Blackboard, and will cover material discussed up until exam date.

Schedule

<i>Week</i>	<i>Date</i>	<i>Topic</i>	<i>Reading</i>	<i>Assignments</i>	<i>Participation Awarded</i>	<i>Due No Later Than</i>
<i>Week 1</i>	<i>1/29</i>	<i>Introduction to Cloud Computing and AWS</i>	<i>Chapter 1</i>	<i>Ch 1 Exercise</i>	<i>2/6</i>	<i>3/27</i>
<i>Week 2</i>	<i>2/5</i>	<i>Elastic Compute Cloud and Elastic Block Store</i>	<i>Chapter 2</i>	<i>Ch 2 Exercise</i>	<i>2/13</i>	<i>3/27</i>
<i>Week 3</i>	<i>2/12</i>	<i>AWS Storage</i>	<i>Chapter 3</i>	<i>Ch 3 Exercise</i>	<i>2/20</i>	<i>3/27</i>
<i>Week 4</i>	<i>2/19</i>	<i>Amazon Virtual Private Cloud</i>	<i>Chapter 4</i>	<i>Ch 4 Exercise</i>	<i>2/27</i>	<i>3/27</i>
<i>Week 5</i>	<i>2/26</i>	<i>Database Services</i>	<i>Chapter 5</i>	<i>Ch 5 Exercise</i>	<i>3/6</i>	<i>3/27</i>
<i>Week 6</i>	<i>3/5</i>	<i>Authentication and Authorization CloudTrail, CloudWatch, and AWS Config</i>	<i>Chapter 6 & 7</i>	<i>Ch 6 & 7 Exercises</i>	<i>3/13</i>	<i>3/27</i>
<i>Week 7</i>	<i>3/12</i>	<i>Network Routing Route 53 and CloudFront</i>	<i>Chapter 8</i>	<i>Ch 8 Exercise</i>	<i>3/20</i>	<i>3/27</i>
<i>Week 8</i>	<i>3/19</i>	<i>Simple Queue Service and Kinesis</i>	<i>Chapter 9</i>	<i>Catch-up Week</i>		<i>3/27</i>
<i>Week 9</i>	<i>3/26</i>	<i>(NO CLASS) - Mid-Term Due (3/20 – 3/27)</i>		<i>Mid-Term</i>		<i>3/27</i>
<i>Week 10</i>	<i>4/2</i>	<i>The Reliability Pillar</i>	<i>Chapter 10</i>	<i>Ch 10 Exercise</i>	<i>4/10</i>	<i>5/8</i>
<i>Week 11</i>	<i>4/9</i>	<i>The Performance Efficiency Pillar</i>	<i>Chapter 11</i>	<i>Ch 11 Exercise</i>	<i>4/17</i>	<i>5/8</i>
<i>Week 12</i>	<i>4/16</i>	<i>The Security Pillar</i>	<i>Chapter 12</i>	<i>Ch 12 Exercise</i>	<i>4/24</i>	<i>5/8</i>
<i>Week 13</i>	<i>4/23</i>	<i>The Cost Optimization Pillar</i>	<i>Chapter 13</i>	<i>Ch 13 Exercise</i>	<i>5/1</i>	<i>5/8</i>
<i>Week 14</i>	<i>4/30</i>	<i>The Operational Excellence Pillar</i>	<i>Chapter 14</i>	<i>Ch 14 Exercise</i>	<i>5/8</i>	<i>5/8</i>
<i>Week 15</i>	<i>5/7</i>	<i>(NO CLASS) - Final Exam Due (5/1 – 5/8)</i>		<i>Final Exam</i>		<i>5/8</i>

This schedule is subject to revision before and throughout the course.

Call 703-993-1000 for recorded information on campus closings (e.g. due to weather).

Graduate Grading Scale:

A+ (97-100), A (93-96), A- (90-92), B+ (88-89), B 83-87, B- (80-82), C (70-79), & F (0-69)

Important Dates

Semester Calendars/Deadlines (<https://registrar.gmu.edu/calendars/>)

Religious Holiday Calendar (<https://ulife.gmu.edu/religious-holiday-calendar/>)

Attendance Policy

Students are expected to attend each class to complete any required preparatory work (including assigned reading) 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 if they miss any class without prior notice.

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 may result in a grade of zero (0) for that exam.

Communications

Communication on issues relating to the individual student should be conducted using email or telephone. Email is the preferred method – for urgent messages, you should also attempt to contact the Instructor via telephone. Email messages from the Instructor must be sent to students' GMU email addresses – if you use another email account, you should forward your GMU email to that account.

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

Honor Code

Students are required to be familiar and comply with the requirements of the GMU Honor Code (available at <https://oai.gmu.edu/mason-honor-code/>).

The Honor Code will be strictly enforced in this course.
All assessable work is to be completed by the individual student.

Students must **NOT** collaborate on the exam or final project.

In order to be able to fully exchange information and ensure complete candor in discussions, the policy of non-attribution will be STRICTLY enforced.

Disability Accommodations:

If you have a documented learning disability or other condition that may affect academic performance you should: 1) make sure this documentation is on file with Office of Disability Services (SUB I, Rm. 2500; 703-993-2474; <http://ods.gmu.edu>) to determine the accommodations you need; and 2) talk with me to discuss your accommodation needs.

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 703-993-2474, <http://ods.gmu.edu>. All academic accommodations must be arranged through the ODS.

If you have a learning or physical difference that may affect your academic work, you will need to furnish appropriate documentation to the Office of Disability Services. If you qualify for accommodation, the ODS staff will give you a form detailing appropriate accommodations for your instructor. In addition to providing your professors with the appropriate form, please take the initiative to discuss accommodation with them at the beginning of the semester and as needed during the term. Because of the range of learning differences, faculty members need to learn from you the most effective ways to assist you. If you have contacted the Office of Disability Services and are waiting to hear from a counselor, please tell me.

Privacy:

Students must use their MasonLive email account to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.