# TCOM690-002: MPLS Fundamentals
## Lecture and Laboratory Course
## Department of Electrical and Computer Engineering
## George Mason University
## Fall, 2012

**Course Description:**
The course covers the principles and theory of MPLS thoroughly. It explains the MPLS applications that made MPLS so popular, including MPLS VPN, MPLS traffic engineering (TE), Any Transport over MPLS (AToM), and QoS. The class is interleaved with hands-on labs, detailing how to implement and troubleshoot MPLS and its applications.

The major educational objectives of the course are listed below:

- An introduction to MPLS, its important applications, and how it came about.
- The fundamentals of MPLS Architecture, and its basic building blocks.
- Label distribution protocols, and how labels retained and advertised.
- Label forwarding and the usage of the MPLS labels.
- Quality of Service (QoS) with MPLS.
- Explain the architecture of the most popular of all MPLS applications: MPLS VPN.
- How the MPLS network can transport Layer 2 services.
- Explain how traffic engineering (TE) is implemented with the MPLS technology.
- Discuss how the MPLS network can provide QoS and how the QoS information is propagated in MPLS networks

**Instructors:**
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Office Hours: by appointment, email to setup appointment

**Course Time:**
Course Meeting Time:  7:20-10:00pm
Lecture: Mondays in Research Hall 201
Lab Session I : Mondays in Research Hall 201

**Course Texts**
1.  MPLS Fundamentals. Author: Lic DE Ghein
ISBN-13: 978-1-58705-197-5
ISBN-10:       1-58705-197-4

**Course Grade Breakdown**
The grade for the course is determined from a calculation of points on a 0 to 100 points

scale. Whose components are: **Midterm: 30%    Lab Final: 30%    Final: 40%**
Typically:

| Grade | Point Range |
|-------|-------------|
| A | 95-100 |
| A- | 90-94 |
| B+ | 86-89 |
| B | 80-85 |
| B- | 70-79 |
| C | 60-69 |
| F | 0 - 59 |

You can NOT make up the exams, and you must take the final during the scheduled timeslot -**ABSOLUTELY NO EXCEPTIONS!!** - Coordinate your travel accordingly

**Lecture and labs**
Lecture PowerPoint slides and lab procedures will be posted online. Please login to https://mymasonportal.gmu.edu to access the class folders.

**Class Schedule**

|  | **Topic** | **Date** | **Reading / Lab** |
|---|---|---|---|
| **Lecture 1** | MPLS Evolution and Architecture | 8/27 | Chapter 1-2 |
| | **Labor Day, university closed** | 9/3 | |
| **Lab 1** | Setup Lab topology | 9/10 | |
| **Lecture 2** | Labeled Packets and Label Distribution | 9/17 | Chapters 3-4 |
| **Lab 2** | MPLS in the core | 9/24 | |
| **Lecture 3** | MPLS L3VPNs | 10/1 | Chapter 7 |
| **No Class** | Columbus Day recess (**Monday classes/labs meet Tuesday**. Tuesday classes do not meet this week) | 10/8 | |
| **Lab 3** | MPLS L3VPNs | 10/9 | |
| **Lecture 4** | MPLS Traffic Engineering (TE) | 10/15 | Chapter 8 |
| | **Midterm** | 10/22 | |
| **Lab 4** | Traffic Engineering | 10/29 | |
| **Lecture 5** | Any Transport over MPLS (AToM) Layer 2 Tunneling Protocol V3 (L2TPV3) | 11/5 | Chapter 10, L2TPv3 |
| **Lab 5** | MPLS L2VPNs | 11/12 | |
| **Lecture 6** | QoS | 11/19 | Chapter 12 |
| **Lab 6** | QoS Lab | 11/26 | |
| **Lab** | Lab Final | 12/03 | |
| | | | |
| | **FINAL EXAM** | 12/10 | |

**Schedule Tentative:** The schedule may change as the semester progresses.

**Official Syllabus:** The only official version of this syllabus is the online version, which may change during the semester.

**Attendance Policy:** In class, announcements are sometimes made of new or changed course policies, requirements, modifications to assignments, etc. Information provided in such announcements may not appear anywhere in the course documentation. Furthermore, course sessions will cover some of the material in the readings, but will also include some material not covered by the readings. Therefore, students are *e*ncouraged to attend all classes, however; if you do miss out on a class, it is your responsibility to find out what we covered in class, as well as what announcements might have been made. It is also your responsibility to obtain the missed material.  I normally take attendance at every class. Attendance does not get factored directly into the grading process. However; I do consult attendance records in deciding how much I am willing to extend myself in providing help should you get into academic difficulty during the semester. You are in a much better position to get a "break" if you have been conscientiously attending class.

**Honor Code:** "Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work." I reserve the right to compare Lab reports submitted by students to any other labs by any means necessary to identify violations of the GMU Honor Code. Please notice that the Dean has identified plagiarism as a serious problem at every level of study. Students are required to be familiar and comply with the requirements of the GMU Honor Code.  The Honor Code will be strictly enforced in this course.