1. **Course Number and Course Title**
   COE 49409 - Computer Networks II

2. **Credit Hours**
   2-3-3

3. **Prerequisites and/or Co-Requisites:**
   Prerequisite: COE 371 (Computer Networks I)

4. **Name and Contact Information of Instructor:**
   Dr. Taha Landolsi
   Office: EB1-258
   Email: tlandolsi@aus.edu
   Phone: +971 6 515-2473
   Office Hours: Posted on office door

5. **Course Description (Catalog Description):**
   Examines current topics in computer networks including the following: Network switching, addressing, and trunking, VLANs and inter-VLAN routing, spanning-tree protocols, network redundancy, advanced routing protocols and techniques, and enterprise internet connectivity.

6. **Textbook and other Supplemental Material:**
   Textbook: B. A. Forouzan, *Data Communications and Networking*, 5th edition, McGraw-Hill, 2013.
   Other supplemental material:
   J. Kurose, K. Ross, *Computer Networking: a Top-Down Approach*, 6th edition. Pearson, 2012.
   R. Froom and E. Frahim, Implementing Cisco IP Switched Networks, Cisco Press, 2015.
   D. Teare, B. Vachon, and R. Graziani, Implementing Cisco IP Routing, Cisco Press, 2015.
   W. Stallings, *Data and Computer Communications*, 9th edition, Prentice Hall, 2010.

7. **Learning Outcomes:**
   Upon completion of the course, students will be able to:
   1. Identify the fundamental concepts in bridging, switching, and broadcast domains.
   2. Implement spanning-tree protocols on switched networks.
   3. Design VLANs and implement inter-VLAN routing.
   4. Understand the fundamentals of routing.
   5. Implement advanced routing protocols e.g. EIGRP, multi-area OSPF, and BGP.
   6. Identify the issues in enterprise internet connectivity.
   7. Harden the security of routers and routing protocols in enterprise networks.

8. **Teaching and Learning Methodologies:**
   Methods include lectures, class discussions, homework, and labs.

9. Course Topics and Schedule:

Topic	Weeks (tentative)
Switching fundamentals and VLANs	2
Switched networks design and STP protocols	2
Layer-2 routing, network redundancy and management	2
Routing fundamentals	2
Advanced routing protocols EIGRP and multi-area OSPF	2
Enterprise internet connectivity	2
Routers and routing protocols security hardening	2
Review and evaluations	2
Total:	**16**

10. Schedule of Laboratory and other Non-Lecture Sessions:

Lab	Due Date (tentative)
Basic Switch Configuration, Trunking, Port Channels	Week 2
DHCP, Inter-VLAN Routing, Multilayer Switching	Week 3
STP, RSTP, MSTP	Week 4
L2 vs L3 EtherChannel, HSRP, VRRP, GLBP	Week 5
AAA, 802.1x, NTP, SNMP	Week 6
Lab Midterm Exam	Week 7
RIP, OSPF, EIGRP Overview	Week 8
EIGRP Load Balancing, EIGRP Stub Routing	Week 9
OSPF Virtual Links, OSPF Multi-Area	Week 10
Redistribution EIGRP & OSPF	Week 11
Controlling Routing Updates, Path Control Using BPR	Week 12
BGP Implementation (iBGP, eBGP)	Week 13
Lab Final Exam	Week 14

11. Out-of-Class Assignments with Due Dates:

Assignment	Due Date (tentative)
Homework 1	Week 3
Homework 2	Week 5
Homework 3	Week 7
Homework 4	Week 10
Homework 5	Week 13

12. Student Evaluation:

Assessment	Weight	Due Date (tentative)
Homework	10 %	End of each chapter
Quizzes	10 %	Pop quizzes
Labs	15 %	Weekly
Midterm Exam-I	20 %	Week 7
Midterm Exam-II	20 %	Week 14
Final Exam	25 %	Week 16

13. Contribution of Course to Program Outcomes

Program outcome	Emphasis in this course
(a) an ability to apply knowledge of mathematics, science, and engineering	◑
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	◑
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d) an ability to function on multidisciplinary teams	
(e) an ability to identify, formulate, and solve engineering problems	◑
(f) an understanding of professional and ethical responsibility	
(g) an ability to communicate effectively	
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i) a recognition of the need for, and an ability to engage in life-long learning	○
(j) a knowledge of contemporary issues	
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	●

Emphasis: ● High; ◑ Medium; ○ Low; Blank – Nothing Specific Expected

14. Letter Grade Policy:

Letter Grade	Total (T)
A	$95 \leq T$
A–	$90 \leq T < 95$
B+	$85 \leq T < 90$
B	$80 \leq T < 85$
B–	$75 \leq T < 80$
C+	$70 \leq T < 75$
C	$65 \leq T < 70$
C–	$60 \leq T < 65$
D	$50 \leq T < 60$
F	$T < 50$