1. **Course Number and Course Title**
   COE 49410 – Telecommunications Networks Engineering

2. **Credit Hours**
   3-0-3

3. **Prerequisites and/or Co-Requisites:**
   Prerequisite: COE 370 (Communications Networks)

4. **Name and Contact Information of Instructor:**
   Dr. Taha Landolsi

5. **Course Description (Catalog Description):**
   Examines current topics in telecommunications networks. Covers network elements functions, access, metropolitan and transport network architectures, bandwidth considerations and multiplexing techniques, current engineering practices in designing and optimizing telecommunications networks.

6. **Textbook and other Supplemental Material:**
   Textbook:
   - B. A. Forouzan, Data Communications and Networking, 5th ed., McGraw-Hill, 2013.

   Supplemental material:
   - W. Stallings, Data and Computer Communications, 10th ed. Prentice Hall, 2013.
   - I. Glover, P. Grant, Digital Communications, 3rd ed., Prentice Hall, 2010.
   - J. Kurose, K. Ross, Computer Networking, 7th ed., Pearson, 2016.

7. **Learning Outcomes:**
   Upon completion of the course, students will be able to:
   1. Identify the functions of telecommunication systems and network elements.
   2. Compare the different architectures of access, metropolitan, and transport networks.
   3. Calculate the bit rates of electrical and optical multiplexed systems.
   4. Estimate bandwidth and capacity requirements of telecommunications systems.
   5. Understand design issues in optical and wireless networks.
   6. Apply telecommunication engineering best practices to plan and optimize networks.

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

9. **Course Topics and Schedule:**

Topic	Weeks
Telecommunications networks overview	1
Architectures of access networks	1
Architectures of metropolitan and transport networks	1
Cloud and datacenter network connectivity	1
Digital communications overview	1
Wired transmission media	1
Wireless links characteristics	1
Performance of communications systems	1

Capacity estimation	1
Multiplexing and switching	1
Design of telecommunications networks	1
Management of telecommunications networks	1
Optimization of telecommunication networks	1
Testing and troubleshooting	1
Review and evaluations	2
Total:	**16**