1. **Course Number and Course Title:**
    COE 594-04 Cloud Computing Infrastructure

2. **Credits Hours:**
    3 – 0 – 3

3. **Prerequisites and/or Co-Requisites:**
    Prerequisite: Approval of Program Director
    Co-requisites: None
    Competencies: CMP 220 Programming II and COE 312 or equivalent courses

4. **Name and Contact Information of Instructor:**

    Dr. Raafat Aburukba

5. **Course Description (Catalog Description):**
    Covers advanced topics in cloud computing infrastructure, including: the role of cloud computing in applications such as smart cities, current practices, recent developments, and challenges in cloud computing infrastructure, cloud computing models and enabling technologies such as virtualization and web services, resource control and management, and current research topics.

6. **Textbook and other Supplemental Material:** Textbook:

    *   Igor Faynberg, Hui-Lan Lu, Dor Skuler, <u>Cloud Computing: Business Trends and Technologies,</u> 2016, Wiley

    Other supplemental material:
    *   Sanjay Chaudhary, Gaurav Somani, Rajkumar Buyya, <u>Research Advances in Cloud Computing,</u> December, 2017, Springer
    *   Research papers relevant to topics in cloud computing.

7. **Course Learning Outcomes:**
    Upon completion of the course, students will be able to:
    1. Demonstrate an understanding of the cloud computing building blocks and enabler technologies
    2. Analyze cloud computing models
    3. Create and manage cloud computing data center using current tools
    4. Analyze, model, and implement adequate scheduling techniques for cloud computing data centers
    5. Demonstrate an understanding of cloud computing current practices and challenges
    6. Conduct and present independent research in cloud computing

8. **Teaching and Learning Methodologies:**

Methods include lectures; problem and project based learning methods (simulations tools, and research paper, team project) and class discussions.

9. **Course Topics and Schedule:**

Topic	Weeks
Cloud computing models	1
Cloud computing physical resources and virtualization techniques	2
Service oriented architecture and its importance to cloud computing	1
Fundamental control and management techniques in cloud data centers	1
Modeling techniques for cloud computing resource management	1
Scheduling techniques for single and multiple cloud data centers	2
Tools for creating and managing cloud data centers	1
Workflow modeling and orchestration	1
Current research issues and directions such as resource allocation, latency, fault tolerance, and privacy	3
Research projects presentations	2
Review and evaluations.	1
Total:	**16**