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| **CMPE 448 Modern Networking Concepts** |
| **Department:** Computer Engineering |
| **Instructor Information:****Name:** Prof. Dr. Dogu Arifler**E-mail:** dogu.arifler@emu.edu.tr**Office:** CMPE 218 **Tel:** 1192   |
| **Assistant Information:**Mr. John Olaifa |
| **Meeting Times and Places:**Tuesdays 8:30-10:30, Room CMPE 126Wednesdays 12:30-14:30, Room CMPE 126Fridays 12:30-14:30, Lab CMPE 135 |
| **Program Name:** Computer Engineering | **Program** **Code:** 25 |
| **Course Code:** CMPE 448 | **Credits:** 4 | **Year/Semester:**2019-2020 Fall |
| [ ]  Required Course [x]  Elective Course (click on and check the appropriate box)  |
| **Prerequisite(s):** CMPE 344 Computer Networks |
| **Catalog Description**: Recent trends and topics that form the foundations of modern networking. Topics include but are not limited to software-defined networking (SDN), network functions virtualization (NFV), data centers, cloud networking, Internet of Things (IoT), quality of service (QoS) and quality of experience (QoE) to define and support user needs.  |
| **Course Web Page:** https://staff.emu.edu.tr/doguarifler/en/teaching/cmpe448 |
| **Textbook(s):** W. Stallings, *Foundations of Modern Networking: SDN, NFV, QoE, IoT, and Cloud*, Pearson, 2016 |
| **Indicative Basic Reading List:**N/A |
| **Topics Covered and Class Schedule:****(4 hours of lectures per week)**

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| **Week 1** | An overview of traditional networking concepts; evolving network requirements |
| **Week 2**  | A glimpse at recent trends: “Big data”, cloud computing, IoT, mobility |
| **Week 3** | Gigabit networks; 4G/5G; service and security requirements |
| **Week 4** | SDN: Architecture |
| **Week 5** | SDN: Data center networking; big data over SDN, cloud networking over SDN |
| **Week 6** | NFV: Architectural issues; virtual machines; server migration; load balancing |
| **Week 7** | NFV: Relationship with SDN; dealing with “big data” and implementing cloud computing infrastructures |
| **Weeks 8-9** | *MIDTERMS* |
| **Week 10** | Key concepts of the Integrated Services Architecture; quality of service (QoS) |
| **Week 11**  | Elastic vs. inelastic traffic, DiffServ, service-level agreements, IP performance metrics |
| **Week 12** | Quality of experience (QoE); subjective and objective assessment; QoE/QoS mappings |
| **Week 13-14** | Cloud computing: deployment models; relevance of SDN and NFV |
| **Week 14** | Fog computing or IoT; applications |

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| **Lab Schedule:***Please refer to the course Web site for assigned labs.** Lab 1: 18 October
* Lab 2: 1 November
* Lab 3: 8 November
* Lab 4: 6 December
* Lab 5: 20 December
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| **Course Learning Outcomes:** Upon successful completion of the course, students are expected to have the following competencies:1. Explain modern networking concepts such as SDN and NFV;
2. Describe issues related to “big data”, mobility, network complexity, cloud computing;
3. Define user needs and suggest ways to support them;
4. Understand modern networking architectures: clouds and fog
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| **Assessment** | **Method** | **No** | **Percentage** |
| Midterm Exam | 1 | 40% |
| Final Exam | 1 | 50% |
| Lab Sessions | 5 | 10% |
| **Attendance and Participation:** Attendance to every lecture is mandatory. |
| **NG Policy:** Receiving zero from or missing any of the components (midterm, final, lab) used in determination of the letter grade or attending <50% of the lectures may result in an NG if the accumulated total mark in the course is <50%. |
| **Make-Up Policy:** Only one **comprehensive** make-up examination will be given for a missed midterm or final **only under exceptional/extenuating circumstances** (e.g., hospitalization, loss of a close relative, etc.). In these cases, students must submit a petition with related official reports to me within the next three working days following the missed exam. Note that minor ailments are not considered as exceptional/extenuating circumstances. Eligibility to take the make-up exam **will be subject to my final approval.** |
| **Academic Dishonesty:** Any conduct that attempts to gain unfair academic advantage is considered academic dishonesty. Copying labs and assignments, cheating during exams, substituting for another person are some examples of academic dishonesty. Cases of academic dishonesty will not be tolerated and will be punished according to EMU's disciplinary policies. |
| **Relationship of the course to Student Outcomes:**The course has been designed to contribute to the following student outcomes:1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
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| **Prepared by:** Prof. Dr. Dogu Arifler | **Date Prepared:** 15 September 2019 |