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| **CMSE353 Security of Software Systems** |
| **Department:** FORMTEXT Computer Engineering  |
| **Instructor Information****Name:** Assoc. Prof. Alexander Chefranov**E-mail:** Alexander.chefranov@emu.edu.tr**Office:** CMPE 219**Office Tel:** 1190                     |
| **Assistant Information****Name:** TBD **Office:** TBD |
| **Meeting times and places**Group 1: Monday 8:30-10:20, Room CMPE 128; Friday 12.30-14.20, Room CMPE 128; Monday 14.30-16.20, Room CMPE 134 (Labs);Group 2: Monday 14:30-16:20, Room CMPE 034; Thursday 8.30-10.20, Room CMPE 034, Friday 16.30-18.20, Room CMPE 238 (Labs)Wednesday 12:30-14:20, Room CMPE 135 (Labs)  |
| **Program Name:** Software Engineering | **Program Code: 29** |
| **Course Number:** CMSE 353 | **Credits:** (4,1) 4 Cr | **Year/Semester:**2021-2022 Fall |
|  FORMCHECKBOX   Required Course          FORMCHECKBOX   Elective Course       (click on and check the appropriate box)  |
| **Prerequisite(s):**

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| CMPE201  Fundamentals of Software Engineering  |

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| **Catalog Description**: Information security requirements, security threats, attacks, and methods providing information protection, discretionary and mandatory access models. Malicious software. Symmetric and asymmetric cryptographic methods, DES, AES, RSA. Authentication, digital signature, certificates, one-time passwords, hash functions. Practical aspects of information security in operating systems, databases, network applications. |
| **Course Web Page:** <https://staff.emu.edu.tr/alexanderchefranov/en/teaching/cmse353> |
| **Textbook(s):**Michael T. Goodrich, Roberto Tamassia, Introduction to Computer Security, International Edition, Pearson, 2011, 541 p., ISBN 10: 0-321-70201-8; ISBN 13: 978-0-321-70201-2William Stallings, Cryptography and Network Security. Principles and Practices, 5th Edition, Pearson, 2011, 721 p., ISBN 10: 0-13-609704-9, ISBN 13: 978-0-13-609704-4     |
| **Indicative Basic Reading List :** No  |
| **Topics Covered and Class Schedule:****(4 hours of lectures per week)**

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| **Weeks 1-2** | Introduction. Information security requirements, security threats, attacks, and methods providing information protection, discretionary and mandatory access models  |
| **Week 3-4** | Malicious software, countermeasures. Cryptographic technique. DES |
| **Weeks 5-6** | DES, AES, RSA  |
| **Weeks 7**  | RSA.  |
| **Week 8** | Problem sessions.  |
| **Weeks 9-10** | Midterm exams. |
| **Weeks 11** | Authentication, digital signature. Certificates,  |
| **Weeks 12-13** | One-time passwords, hash functions. Practical aspects of information security in operating systems, databases, network applications.  |
| **Week 14**   | Problem sessions. Term Project report presentation |
| **Weeks 15-17**  |   | Final Exams |

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| **Laboratory Schedule:****(2 hours of laboratory per week, Tentative)**

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| **Week 3-4-5** | Access control acquaintance |
| **Week 6-7** | Access control implementation |
| **Weeks 11-13** | DES |
| **Week 14** | Project presentation |

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| **Course Learning Outcomes:** On successful completion of the course, the student is expected to be able to:(1)      Know information security requirements, security threats, attacks(2)      Know methods providing information protection (3)      Know discretionary and mandatory access models (4)      Know types of malicious software and countermeasures  (5)      Know cryptographic technique(6)      Understand DES, AES, RSA (7)      Understand authentication, digital signature, certificates, hash functions (8)      Know practical aspects of information security in operating systems, databases, network applications (9)      Develop a Secure Software System for Term Project  (10) Make Presentation for Final Project status with demo |
| **Assessment** | **Method** | **No** | **Percentage** |
| Midterm Exam(s) | 1 | 30% |
| Attendance |   | 0 % |
| Labs | 3 | 10% |
| Project | 1 | 20 % |
| Final Examination  | 1 | 40% |
| **Computation of the attendance grade:** Attendance is taken every lecture and entered to EMU portal. Those missing more than 20% of classes without valid excuse may get NG grade  |
| **Policy on makeups:** If you miss a midterm or final exam, you can take a make-up exam (for the midterm or final exam) if you have valid excuses (e.g., you are sick) and provide material evidence for it (e.g., a doctor’s report which must be issued/approved by EMU Health Center) within 3 working days of the exam. Resit exam may be taken according to its rules.  |
| **Policy on cheating and plagiarism:** Any student caught cheating at the exams or assignments will automatically fail the course and may be sent to the disciplinary committee at the discretion of the instructor.  |
| **Contribution of Course to ABET Criterion 5**Credit Hours for:  Mathematics & Basic Science : 0Engineering Sciences and Design : 4 General Education : 0  |
| **Relationship of Course to Program Outcomes****The course supports achievement of the following program objectives**1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives    |
| **Prepared by:** Prof. Dr. Alexander Chefranov | **Date Prepared:** 2October 2021 |
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