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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**~~Monday~~ Tuesday 8:30-10:20, Room CMPE 036 All the classes are onlineFriday 4:30-16:20, Room CMPE 036Wednesday 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:**2020-2021 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 j1(2)      Know methods providing information protection j1(3)      Know discretionary and mandatory access models j1(4)      Know types of malicious software and countermeasures  j1(5)      Know cryptographic technique cmse-m, j1(6)      Understand DES, AES, RSA cmse-m, j1(7)      Understand authentication, digital signature, certificates, hash functions j1(8)      Know practical aspects of information security in operating systems, databases, network applications j1(9)      Develop a Secure Software System for Term Project     c1, d, cmse-l(10) Make Presentation for Final Project status with demo  g1, g2 |
| **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**(c1) an ability to design a system to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability(g1). an ability of effective oral communication 10(g2). an ability of effective written communication 10(j1) a knowledge of computer related (technical) contemporary issues 1-8(cmse-l) an ability to analyze, design, verify, validate, implement, apply, and maintain software systems 9(cmse-m) an ability to appropriately apply discrete mathematics, probability and statistics, and relevant topics in computer science and supporting disciplines to complex software systems(cmse-o) an ability to manage the development of software systems  9  |
| **Prepared by:** Assoc. Prof. Dr. Alexander Chefranov | **Date Prepared:** 10October 2020 |
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