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| **1. Course title/number, number of credit hours****COT 5930 / 4930** |
| **Randomized Algorithms** |  3 of credit hours |
| **2. Course prerequisites, corequisites, and where the course fits in the program of study** |
| Prerequisites: COT 4400 Design and Analysis of Algorithms  |
| **3. Course logistics** |
| *Term*: Fall 2015This is a classroom lecture course *Class location and time: Computing Building Boca 128, Tuesday and Thursday 11:00 – 12:20* |
| **4. Instructor contact information** |
| *Instructor’s name**Office address**Office Hours* *Contact telephone number**Email address* | Dr. Feng-Hao LiuEE 529 TBD561-297-2341fenghao.liu@fau.edu |
| **5. TA contact information** |
| *TA’s name**Office address**Office Hours* *Contact telephone number**Email address* |  TBD |
| **6. Course description** |
| Probability, randomness, statistics have been playing an important role in computer science, ranging from purely theoretical studies (e.g. complexity theory) to highly practical applications (e.g. secure communication, page ranking, network routing, etc.) Research in the related fields has been extremely active since the past three decades. This course will introduce several basic techniques in the design and analysis of randomized algorithms. With each technique, we will demonstrate various applications to see how it can be applied. We will see how and why randomness can be so powerful that bypasses some barriers of deterministic algorithms. Also, we will see its limitations.  |
| **7. Course objectives/student learning outcomes/program outcomes** |
| *Course objectives* | To learn the power of randomness in computer science, and how to design and analyze randomized algorithms.  |
| *Student learning outcomes**& relationship to ABET a-k objectives* |  |
| **8. Course evaluation method** |
| Homework - 70 %Midterm - 10 %Final Examination - 20 % | *Note*: The minimum grade required to pass the course is C. |
| **9. Course grading scale** |
| Grading Scale: 90 and above: “A”, 87-89: “A-“, 83-86: “B+”, 80-82: “B”, 77-79 : “B-“, 73-76: “C+”, 70-72: “C”, 67-69: “C-“, 63-66: “D+”, 60-62: “D”, 51-59: “D-“, 50 and below: “F.” |
| **10. Policy on makeup tests, late work, and incompletes** |
| Assignments are to be submitted on time, with possible point penalties for late submissions. In no casewill an assignment be accepted after the graded papers for that assignment have been returned to the students. However, appropriate accommodations will be made for students having a valid medical excuse for being unable to work on an assignment during its two week period. |
| **11. Special course requirements** |
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| **12. Classroom etiquette policy** |
| University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions. |
| **13. Disability policy statement** |
| In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures. |
| **14. Honor code policy** |
| Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at [www.fau.edu/regulations/chapter4/4.001\_Code\_of\_Academic\_Integrity.pdf](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf) |
| **15. Required texts/reading** |
| There is no required textbook. The lectures will follow the book: Probability and Computing: Randomized Algorithms and Probabilistic Analysis. By Michael Mitzenmacher and Eli Upfal. |
| **16. Supplementary/recommended readings** |
| * Randomized Algorithms. By Rajeev Motwani and Prabhakar Raghavan
* The probability method. By Noga Alon and Joel H. Spencer
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| **17. Course topical outline, including dates for exams/quizzes, papers, completion of reading** |
| * Introduction: the power of randomness in computer science
* Background of (discrete) probability: random variables, expectations
* Chernoff bounds and applications
* Balls, bins, and random graphs
* The probabilistic methods
* Markov chains and random walks
* Entropy, randomness, and information
* Other selected topics (e.g. Monde Carlo methods, martingale, derandomization, Applications in Cryptography)
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