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| **ELEMENT** | **CONTENT** |
| DEPARTMENT | CIS |
| AUTHOR (S) | Craig Damon |
| COURSE NUMBER | **CIS 5050** |
| COURSE TITLE | **Advanced Data Structures & Algorithms** |
| SHORT TITLE | Adv Algorithms |
| COURSE LEVEL | 5000 |
| DATE CREATED | 11/28/2012 |
| CHECKED/CHANGED | 2/6/2017 |
| PREREQUISITES | CIS 3050 |
| COREQUISITES |  |
| RESTRICTIONS | Graduate standing |
| SPECIAL FEES | No |
| CREDITS | 3 |
| HOURS | 3 hours of lecture per week |
| SEMESTER | Spring |
| COURSE DESCRIPTION | This course prepares the graduate student to understand, implement, and analyze sophisticated algorithms and data structures. |
| SUGGESTED TEXTS |  |
| OPTIONAL TEXTS |  |
| COURSE OUTCOMES | The successful student will be able to:   1. Choose appropriate data structures and algorithms for complex problems 2. Implement these data structures and algorithms in an appropriate programming language 3. Analyze the run time and space efficiency of complex data structures and algorithms |
| COURSE CONTENT | 1. Review of asymptotic analysis 2. “Divide and conquer” approaches 3. Binary search trees, red-black trees, splay trees 4. Dynamic programming 5. Amortized analysis 6. B-trees 7. Disjoint sets 8. Graph algorithms 9. Linear programming 10. Event-based architectures 11. String matching 12. Approximation algorithms |
| LAB/STUDIO OUTCOMES |  |
| LAB/STUDIO CONTENT |  |
| LECTURE CAPACITY | 32 |
| LAB CAPACITY |  |
| GRADED OR P/NP | Graded |
| EVALUATION | Homework, exams |
| DELIVERY METHOD | LEC |
| ROOM REQUIREMENTS |  |
| AUTHOR’S NOTES | Undergraduate-level cross-listed course is CIS 4210. |