Course Syllabus – CSC 638/738 – Advanced Algorithms

Instructor: Bikramjit Banerjee
Email: Bikramjit.Banerjee@usm.edu
Office: TEC 201
Office Phone: 601-266-6287
Office Hours: 11:00-12:00 (MW) + 1:00-3:00 (TTh) + by appointment

Course Prerequisite(s)
1. CSC 413/513—Algorithms (or equivalent): Required.
2. Thorough knowledge of basic computational concepts, discrete mathematics, and statistics: Preferred.

Textbook(s) and/or Other Required Material

Additional course materials may be posted on the class website (URL is case-sensitive):
http://www.cs.usm.edu/~banerjee/CSC738
Various notifications and assignments will also be posted on this webpage, so be sure to check this URL often.

Attendance
You should do your best to attend every class. Knowledge presented in class will be critical for passing the midterm and the final.

Email policy
If you send me any email, you must include your full name in the email, and mention “CSC 638/738” on the subject line. I may not respond to your email if you fail to do so.

Workload
There will be a few home-works/assignments in addition to a midterm, and a final exam. The workload will be targeted to roughly 6 to 8 hours per week (on the average) outside of class. Additionally, each student must make one presentation of some algorithmic approach for solving a non-trivial problem, along with analyses. This could be based on your graduate research.

Assignments
Assignments must be submitted on A4-sized paper, and stapled. Emails, or dog-eared submissions will not be accepted. Use an electronic word processor if you can, and submit in print. Hand-written assignments must be clear and legible. Submissions not adhering to these requirements will be considered “not submitted”.

Grading
40% Assignments
10% Presentation
25% Midterm
25% Final
Late assignments will be penalized by 20% per calendar day, except for extreme circumstances. If possible, give the instructor advance notice of any problems. In order to get a good distribution of
grades, it might be necessary to apply a scale or curve. You may not be allowed to take the midterm or the final exams on days other than the declared dates.

**Disability accommodations**

If a student has a disability that qualifies under the Americans with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.

**Address:**
The University of Southern Mississippi  
Office for Disability Accommodations  
118 College Drive # 8586  
Hattiesburg, MS 39406-0001

**Voice Telephone:** 601.266.5024 or 228.214.3232  
**Fax:** 601.266.6035  
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1.800.582.2233 (TTY) or emailing ODA at oda@usm.edu.

**Academic honesty**

Students are encouraged to collaborate in preparing for tests, and even for homeworks or assignments. However, the final work submitted must be the student's own work. **Whenever you collaborate for an assignment, you must declare the names of all collaborators in the team, and the percentage effort of every team member including yourself.** No collaboration will be allowed during tests.

All students at the University of Southern Mississippi are expected to demonstrate the highest levels of academic integrity in all that they do. Forms of academic dishonesty include (but are not limited to):

1. Cheating (including copying from others’ work). *Blind use of online solution manual falls in this category, and will be prosecuted severely.*
2. Plagiarism (representing another person’s words or ideas as your own; failure to properly cite the source of your information, argument, or concepts).
3. Falsification of documents
4. Disclosure of test or other assignment content to another student
5. Submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members’ involved
6. Unauthorized / undeclared academic collaboration with others
7. Conspiracy to engage in academic misconduct

Engaging in any of these behaviors or supporting others who do so will result in academic penalties and/or other sanctions. *If I determine that a student has violated our Academic Integrity Policy, the first occurrence will be sanctioned with 0 credit for the entirety of that work, and the second occurrence will result in a grade of “XF” for the course, which will be on the student’s transcript with the notation “Failure due to academic misconduct.”*

For more details, please see the University’s **Academic Integrity Policy** ([https://www.usm.edu/institutional-policies/policy-acaf-pro-012%20](https://www.usm.edu/institutional-policies/policy-acaf-pro-012%20)). Also check out the website: [https://www.usm.edu/provost/students-guide-academic-integrity](https://www.usm.edu/provost/students-guide-academic-integrity). Note that repeated acts of academic misconduct will lead to expulsion from the University.
Course Plan
I plan to cover some important concepts that are usually skipped (or not covered in depth) in undergraduate or introductory graduate courses. This means the course will be more of a gap-filler than a regular, smooth-flowing course. The success of this strategy depends on your mastery of the concepts taught in lower level classes. The tentative list of topics is:

- Probabilistic analysis and randomized algorithms (ch. 5)
- Median & order statistics (ch. 9)
- Dynamic programming (ch. 15)
- Greedy algorithms (ch. 16)
- Backtracking, branch-and-bound (handout)