

## Fall 2017: CIS 431 - Algorithms (3 Credits)

MWF 11:10-12:00. SN 338.

### Instructor

Dr. Zhijun Wang

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### Course Description

From the Catalog – The topics of this course include basic tools for algorithm analysis including asymptotic notations, lower and upper bounds, and recursive relations; advanced data structures; analysis of recursive algorithms; analysis of algorithms for searching and sorting; analysis of graph and geometric algorithms; analysis of numerical algorithms; study of NP-complete problems; and study of parallel algorithms. Prerequisites: MATH 208, MATH 307, and CIS 321.

### Mandated Goals/Learning Outcomes

- LEAP goal – Intellectual and practical skills throughout the curriculum.
- Learning outcomes – Critical thinking and creative thinking.

### Specific Course Goals

- Learn fundamental algorithms and their implementation methods.
- Analyze performance of algorithms using theoretical analysis and programs.
- Improve program design and implementation skills through practice.

### Tentative Schedules

- Exam 1 – 9/20. Exam 2 – 10/11. Exam 3 – 11/8. Final exam – 12 – 2 pm on 12/13.
- Week 1 – 4. Java structure review. Abstract data types. Algorithm analysis.
- Week 5 – 7. Sorting and searching algorithms and their performance.
- Week 8 – 11. Graph implementation. Graph problems and algorithms.
- Week 12 – 15. String algorithms. NP-completeness. Advanced topics.
- For detailed schedules and assignments with due dates etc., please visit <http://webpages.shepherd.edu/zwang/431.html>.

### Textbook

Recommended - “Algorithms (4<sup>th</sup> Edition)” by Robert Sedgewick and Kevin Wayne, Addison-Wesley Professional 2011. ISBN: 978-0321573513.

### Evaluations

- Assignments/Projects – 50%  
No late assignment/project will be accepted without a documented excusable reason. Due dates are posted on the course website. Please start early.

- Three Midterm Exams – 30%  
The first missing midterm exam can be excused with an excusable reason such as an absence with a doctor's written notice. In this case the final exam carries its weight.
- Comprehensive Final Exam – 20%  
A missing final exam receives a zero. No exception.
- Final Grade – A  $\geq$  90%, B  $\geq$  80%, C  $\geq$  70%, D  $\geq$  60%, F < 60%.

## **Federally, HEPC, and Shepherd Mandated Policies**

### **Disability Support Services**

Disability Support Services at Shepherd University believes that every student should succeed, and works closely with students to meet their needs. Students requesting any disability related accommodation should contact the Disability Coordinator at 304-876-5122. This includes students with learning disabilities needing classroom accommodations, students requesting specific housing accommodations for health-related reasons, and all other disability accommodations. Accommodations need to be documented and provided to instructors. Please see <http://www.shepherd.edu/disability> for more information.

### **Academic Integrity**

Each student in this course is expected to abide by the Shepherd University Academic Integrity Procedures in the Student Handbook – <http://www.shepherd.edu/conduct>.

### **Class Attendance**

You must attend your classes regularly and engage in the requirements for each class; otherwise, your financial aid may be revoked either partially or in full. This would result in an amount due by you to the University immediately. Please refer to <http://www.shepherd.edu/financialaid> for more details.

### **Shepherd and CME Suggested Policies and Information**

Free tutoring scheduling. Please refer to the academic support center's website at <http://www.shepherd.edu/academic-support/>.

Cell Phone and Text Messaging Policy – Please turn your cell phone off or put it in the silent mode. Please talk outside of the classroom if needed. No texting please.

Students in athletics – It is your responsibility to provide a letter signed by your coach listing all of the days in which you will be absent. Accommodations will be made only if the letter is received from your coach no later than the end of the first week of class.

**The instructor reserves the right to update this syllabus, but only when necessary. In this case students will be notified in a reasonable and timely fashion.**