Instructor: Adrian Dumitrescu, EMS 1081, 229-4265, Email: dumitres@uwm.edu.
Office Hours: (may change) Tue & Thu 12:30–1:20pm or by appointment.
Course web-page: http://www.cs.uwm.edu/classes/cs535/
University policies and other information: http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf
Prerequisites: JR St; Grade of C or better in CS 317 and CS 351.
Level: U/G.
Course description: The course discusses general principles for algorithm design. It makes an introduction to data structures and algorithms commonly used in programming. Students are expected to learn how to analyze the time and space complexities of algorithms, how to prove the correctness of algorithms, and how to use basic data structures and algorithmic paradigms in the design of algorithms for specific problems.
Outline: Tentatively lectures will cover the following material. Some sections from the textbook may be given as reading assignments and additional material may be introduced.
1. Asymptotic notation, algorithm analysis [Ch. 3]
2. Recurrence relations [Chapters 2,4]
3. Lists, stacks, queues [Ch. 10]
4. Disjoint sets [Ch. 21]
5. Heaps, priority queues [Ch. 6]
6. Sorting [Chapters 2,6,7]
7. Binary search trees [Ch. 12]
8. Red-black trees [Ch. 13]
9. Hashing [Ch. 11]
10. Dynamic programming [Ch. 15]
11. Elementary graph algorithms [Ch. 22]
12. Minimum spanning trees [Ch. 23]
13. Single-source shortest paths [Ch. 24]
14. Number-theoretic algorithms [Ch. 31]
15. Algorithm design techniques
Grading scheme: Exams: 75%, In class participation 15%, Overall behavior and discipline 10%.
The exams are closed books and notes. No electronic devices are permitted. Makeup exams will not be given.
By a Graduate School requirement, a graduate student taking this U/G level course must do additional work in some assignments and exams.
Remarks:
1. Being disciplined and having an active class participation is part of your grade. This means being active in class without disrupting the class and having a positive learning attitude. You are expected to attend class and participate in the discussions. People may have different ideas about possible approaches and discussions will help you get a better understanding of the ones that work. Finding errors and/or inaccuracies in the lecture notes or textbook or on the board is encouraged.
2. The following rules of good behavior and discipline need to be respected: You need to show respect to the instructor and your colleagues and respectfully exchange ideas and opinions. You are expected to follow and participate in the discussion, and not be preoccupied with other activities. Occupy your seat before the start time of the class, and avoid leaving or entering during lecture time; you are asked to not bring
food or drinks to class. If you send email to
the instructor you need to address it prop-
perly.
When you are sick, avoid coming to class;
if you still need to come (in an exceptional
situation), you need to sit as isolated as pos-
sible in the back row and avoid contact with
others (to minimize the chance of transmit-
ting your illness to others).
3. Electronic devices, including laptops,
tablets, phones, etc., can only be used for
class purpose, and when directed so by the
instructor.
4. Such devices are prohibited during exams;
any such device should be turned off and
put away (out of sight) in your bag. A stu-
dent found in possession of an electronic de-
vice during an exam should be considered
to be engaged in academic misconduct and
should expect to receive a grade of zero on
the exam. Before any exam you need to
stow away your bag in a separate area of
the exam room; you can only retrieve your
bag after handing in your exam before leav-
ing the room.
5. Attendance is not part of your grade. How-
ever, if you missed a class, you should bor-
row the notes for that class from another
colleague. You are strongly advised to take
written notes throughout the course, since
not all topics may be covered in the text-
book or the coverage/approach might differ
from that in class. In addition, this will pre-
pare you better for the written exams.
6. Homework assignments will be given and
you will be asked to present your solutions
in class. Homework is due for discussion
usually one week after it was assigned, at
the beginning of the respective class period.
The homework will involve about 6-7 assign-
ments. Quizzes based on homework prob-
lems may be given in class. While you can
discuss solutions to homework assignments
with others, the solution must be prepared
independently by you and so you you would
be comfortable in explaining it. If you dis-
cussed any assignments with others, specify
their names in your solutions. Similarly, if
you use other materials/sources you need to
clearly specify them in your solutions. Note
that the midterm and final exams may use
problems directly taken from homework as-
signments, so you are strongly advised to do
the homework. It is unlikely that you will
perform well in this course without a sub-
stantial effort to work on and understand
the assignments.
7. You are expected to provide justifications
and arguments, that is, show your work, to
support your answers in all your assign-
ments and exams, regardless if the problem
explicitly asked for it or not. Unjustified or
poorly justified answers will receive little or
no credit.
8. If you have to miss an exam or the deadline
of an assignment because of an emergency,
please contact the instructor at the earliest
possible opportunity (use both e-mail and
phone). If the instructor is not reachable,
then try to contact the department secre-
tary at 229-4677. No arrangements will be
made for missed exams, unless these rules
are followed and an acceptable evidence of
legitimate emergency is submitted.
9. Plagiarism or cheating is taking some-
one else’s work and calling it your own.
Plagiarism is not allowed and will be
dealt with severely; it is a form of
academic misconduct. In particular,
copying from other sources (including
the internet) without proper citation is
disallowed. More information on academic
misconduct is available at http://uwm.
edu/academicaffairs/facultystaff/
policies/academic-misconduct/
10. Your work will be graded not only on the
correctness of the result, but also on the
quality of presentation. An understandable
handwriting is expected.