CSE 331, Introduction to Algorithm Analysis and Design

FALL 2015

Mon Wed Fri 1:00-1:50pm, NSC 215

- It is **your responsibility** to make sure you read and understand the contents of this syllabus. If you have any questions, please contact the instructor.
- Thanks to Carl Alphonce for kindly allowing the use of some language from his syllabus in this document.
- Please complete the online anonymous feedback form. Filling up the form is optional but I encourage you to fill at least the part about your preferred office hours.

Instructor Information

Atri Rudra (http://www.cse.buffalo.edu/ atri)

- *Email:* `atri "at" buffalo "dot" edu`
- *Office:* 319 Davis
- *Phone:* 645-2464
- *In-person Office Hours:* Mondays, 2:00-2:50pm and Wednesdays, 3:00-3:50pm.

It is preferable to set up an appointment (by email) if you want to talk to me outside of my office hours. However, you can drop by if my office door is open.

TA Information

Md S Q Zulkar Nine

- *Email:* `mdsqzulk "at" buffalo "dot" edu`
- *Office:* 302 Davis
- *Office Hours:* TBA

S Mehdi Shamsi

- *Email:* `seyedmah "at" buffalo "dot" edu`
- *Office:* 302 Davis
- *Office Hours:* TBA.

331 Ninja

331 Ninja is someone who floats around helping students with their question as and when they can.[1] The 331 ninja will not be involved in grading so please do *not* go to the Ninja with grading questions.

Isaac Reath

- *Email:* `isaacrea "at" buffalo "dot" edu`
- *Office:* 302 Davis
- *Office Hours:* Thursdays, 5:00-7:00pm.

Recitations

You should have signed up for one of these four recitation sections:

- Mondays, 12:00-12:50pm (127B Cooke)
- Mondays, 4:00-4:50pm (139 Hoch)
- Tuesdays, 9:00-9:50am (209 Norton)
- Fridays, 9:00-9:50am (209 Norton)

Attending the recitations is *very* important, as it will cover material that could not be covered well in the lecture due to time constraints and/or discuss homework problems (and their solutions once the homeworks have been turned in). Also the recitations will provide an opportunity to ask your questions in a smaller gathering.

Course Description

(*From the course catalog*)

Introduces methods for algorithm design, paradigms such as divide and conquer, greedy, and dynamic programming, and techniques for algorithm analysis, such as asymptotic notations and estimates, as well as time/space tradeoffs. Topics include sorting, searching, scheduling, string matching, graph algorithms, computational geometry, and more.

Pre-requisites

Data Structures (CSE 250), Discrete Math (CSE 191) and College Calculus II (MTH 142). Ideally, you should have a grade of C^- or above in these courses. If you do not satisfy the requirement, please come and see me.

(ABET) Learning Outcomes

This course is required of all computer science students and has a significant relationship with the following program objectives for computer science:

(a) an ability to apply knowledge of computing and mathematics appropriate to the discipline.

(g) an ability to analyze the local and global impact of computing on individuals, organizations, and society.

This course has a strong relationship with the following program objective for computer science:

[1] The usage of "Ninja" in the context of a course is due to Geoffrey Challen.

(j) an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

References

We will be using the following textbook:

Jon Kleinberg and Éva Tardos, "Algorithm Design." Addison Wesley, 2005.

Occasionally, we might study topics that are not covered in the textbook. In such cases, supplementary material will be provided.
The following textbooks could be useful references:

Thomas S. Cormen, Charles E. Leiserson, Ronald Rivest, and Clifford Stein, "Introduction to Algorithms (2nd Ed)." MIT Press, 2001.

Sanjoy Dasgupta, Christos H. Papadimitriou and Umesh Vazirani, "Algorithms." McGraw Hill, 2007.

Donald Knuth, "The Art of Computer Programming Volumes 1, 2, 3, 4." Addison Wesley.

Alfred V. Aho John E. Hopcroft and Jeffrey Ullman, "Data Structures and Algorithms." Addison Wesley, 1983.

Richard E. Neapolitan and Kumarss Naimipour, "Foundations of Algorithms (4e)." Jones and Bartlett, 2009.

Daniel J. Velleman, "How to Prove It: A Structured Approach (2nd Ed)." Cambridge University Press, 2006.

Schedule

We will have roughly 13 weeks worth of classes. Here is a tentative list of topics that we will cover (KT refers to the textbook):

- Introduction [KT, Chap 1] (1.5 weeks).
- Asymptotic Analysis [KT, Chap 2] (1 week).
- Graph Basics [KT, Chap 3] (2.5 weeks).
- Greedy Algorithms [KT, Chap 4] (3.5 weeks).
- Divide and Conquer Algorithms [KT, Chap 5] (2.5 weeks).
- Dynamic Programming [KT, Chap 6] (2 weeks).
- NP-completeness and other advanced topics [KT, Chap 8] (1 lecture).

A more detailed schedule will appear at

http://www-student.cse.buffalo.edu/~atri/331/fall15/schedule.html

Piazza

We will be using Piazza (https://piazza.com/buffalo/fall2015/cse331/home), which will be the one stop shop for the course. All announcements will be made on Piazza. If you are attending the course, you **must** check Piazza regularly. I would **strongly** urge you to enable email notifications on piazza (it is on by default). These announcements will include the ones that inform if and when classes/office hours are re-scheduled etc.

Usually, the instructor and the TAs will be the only ones who will write the entries. There will be an entry for each lecture and homework. Sometimes, the entries may include side comments or stories that I feel are relevant to the course (but are not directly related to the lectures). Also there will be a weekly True/False poll/question to prepare you better for True/False questions on the exams (which you guys will generally not see on the homeworks). Try and work these problems on your own to prepare better for the exams.

We will also be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com. To familiarize yourself with the system, look at their help page.

You will need to sign up for Piazza. To do so, go to

https://piazza.com/buffalo/fall2015/cse331.

Couple of other points:

1. You can post anonymously but note that you will be anonymous to *students only*. Your identity will be known to me and the TAs.
2. Please make sure that you use your UB email to sign up– this is to make sure that I can verify your identity if necessary.
3. You can write posts that are private to just the instructors but if we feel that the answer would be relevant to the class then we reserve the right to make the post public. (If you would like not to have your name in the public version of your private post, please post anonymously in the private post too. Note by the first point, we will still know your identity.)

Grading Policy

Here is the split of grades:

- Piazza participation (2%)
- Mini project (4%)
- Homeworks (31%)
- Quizzes (3%)
- Exams (60%)

See the next few sections for more details on each of the above components.

To get an A in the course, you will *have* to obtain a total of 90.00% or more. The rest of the letter grades will be given based on the curve.

Please see the university rules (http://undergrad-catalog.buffalo.edu/policies/grading/explanation.shtml#incomplete) for university rules on an incomplete. I will not consent to an incomplete except in provably extreme circumstances.

Piazza Participation

If you do not participate[2] at all, you get a 0. (Note that reading a question or comment does not qualify as participating.) If you are in the bottom quarter by activity among participating students you get 1 point, otherwise you will get 2 points. (Piazza supplies participation statistics, which I will use to figure out which group you will land up in. This will work even if you post anonymously to the class.)

Since piazza will only show you the number of times you have participated, at the end of each month, I will specify the cut-off for the bottom quarter of the class piazza activity. (If I forget to do this, please send me a reminder: on piazza!)

Mini Project

Logistics. Below are the logistical details.

You will form groups of size **exactly seven** for this part of the course. Your mini project will be to study a specific algorithm (it could be an algorithm that we cover in class or it could be an algorithm that you read up from somewhere else). The following are the logistics:

- A list of the members of your group (with seven students) is due by **11:59pm, Wednesday, October 7, 2015**.
- Every group will have to pick different algorithms. An algorithm that is picked by multiple groups will be allotted to the first group that emails me with their choice. A list of algorithms already picked will be online.
- A two page report (excluding references), which **has to be in PDF** format, is due by **11:59pm, Wednesday, November 11, 2015**.
- The group will make a **4 minute presentation** in class on **Wednesday, December 9, 2015** or **Friday, December 11, 2015**. The slots will be filled on a first-come-first serve basis.
- The report and presentation will each be worth 2% of the grade. All members of the group will receive the same grade.

The mini project will assess student learning outcome (g).

Contents of Report and Presentation. Both your report and presentation must focus on the **impact of the algorithm on individuals, organizations, and society at large**. You should clearly state the problem that the algorithm is solving and the previous method used to solve the problem. You should be able to clearly demonstrate the impact of the algorithm that you chose. (As long as the impact is demonstrable/documented, there is no restriction on the specifics.) Refrain from putting in the pseudocode for the algorithm: if necessary present a description of the algorithm in English. Ideally, you should just present the main idea(s) behind the algorithm.

In particular, both your report and presentation have to address the following:

- PROBLEM: You should clearly define the problem you are trying to solve. Ideally, if it is possible you should state the mathematical description of the problem.
- ALGORITHM: You should clearly present the main ideas behind the algorithm. This would be similar to algorithm ideas you guys will be submitting in your homeworks. Algorithm details (e.g. pseudocode) is not required but you can put them in your report (but refrain from doing so in your presentations).
- IMPACT: You must clearly articulate the impact of the algorithm on individuals, organizations, and society at large. Some examples could be: impact on security of society at large or economic impact of an algorithm. The important point is to clearly state demonstrable impact. That is, vague sentence like this algorithm had a big impact is not good enough. Whatever impact you claim, it should be backed by sources. So e.g. if you say your chosen algorithm had an economic impact of one billion USD: then you should cite a source that

[2] This means asking a question or answering a question on the discussion board.

backs this claim. It might be helpful to state what folks were doing before to solve the problem your chosen algorithm solves and what were their short comings (and how your chosen algorithm overcame them).

For both the report and the presentation the problem and algorithm ideas will be worth 25% each while the impact of your algorithm will be worth 50% of the grade.

More details on the presentation. First, if you have a preference for presenting on Wednesday, December 9 or Friday, December 11, please email me your preference by **11:59pm, Monday, December 7, 2015**. If the slots are not filled up by then, I am going to make the rest of the assignments arbitrarily on December 8 morning.

Here are other pertinent details on the presentation:

- Your slides should be emailed to me before midnight before your talk. That is, by **11:59pm on December 8** for a December 9 presentation and by **11:59pm on December 10** for a December 11 presentation.
- Your slides have to be in **PPT, PPTX** or **PDF** format.
- Your presentation has to have **four (4)** slides in the following order: (1) Title slide (which must not include any detail other than the name of the algorithm and the group composition), (2) Problem statement (a general overview and a formal definition if appropriate), (3) Algorithm idea (**no** pseudocode please), (4) Impact of your algorithm (present precise, verifiable impact).
- You will have four (4) minutes for your presentation. **The time limit will be strictly enforced.** If 4 minutes are done in mid sentence, then you will have to stop in mid-sentence. So make sure you practice to keep the timing under control. It is fine to finish before 4 minutes.
- The set of speakers is up to the group. I would recommend having one or at most two speakers. This will help with the timing. Of course if you as a group decide to have more that is up to you but remember the above point.
- You will be able to use your slides (they will be uploaded on to the computer in the room) and will be able to use a microphone.
- In addition to the content, your presentation will also be graded on delivery.

Some other points.

- Algorithms are used very frequently in practice so this is an opportunity for you to discover the utility of the material we cover in class on your own.
- Unlike other aspects of the course, for the mini project you can refer to any source you want as long as (i) you explicitly refer to your source and (ii) the report and presentation are your own.
- You will need to “register" your group as well as your algorithm choice. To do this send email to `atri "at" buffalo.edu` with the algorithm choice and the names of the group members. Algorithms will be allotted on a first-come-first-serve basis.
- Once an algorithm has been chosen by a group, the choice cannot be changed. Hence, make your choice carefully, keeping in mind that you need to demonstrate the impact of your chosen algorithm.
- Only one report should be submitted by email per group.
- Only one presentation per group. The group can decide on the presenters. Presentations will be in class in the last two lectures: the dates will be allotted on a first-come-first-serve basis. To reserve your slot, please send email to `atri "at" buffalo.edu` with your choice of the two days.

Homeworks

Homeworks will be handed out on Fridays in class and will be due in class before the *start* of the next lecture on Friday. There will be **10** homeworks. In addition, there will be a Homework 0, which will be graded but will not count towards your final grade. Homework 0 is just to give you feedback on your proofs so that you can avoid your mistakes in the homeworks that will count towards your grade. Homework 0 will be handed out on the first day of class and will be due on Friday, September 4, 2015. *Submitting Homework* 0 *is optional.*

No late submission will be accepted. (The entire homework schedule is on the schedule page and is reproduced at the end of this section, so please plan accordingly.) However, the *three lowest score on your homeworks will be dropped.* I strongly encourage you to save these three homeworks till the end of the semester when you will be very busy with projects etc. or for possible sick days.

Citing Sources. You can **ONLY** use the following sources for reference once you start working on the homework problems: **the Kleinberg-Tardos textbook, any material linked from the CSE 331 piazza page (including any discussion in the Q&A section), specific *mathematical* result from a previous course and any notes that you might have taken during class**. In particular, **YOU ARE NOT SUPPOSED TO SEARCH FOR SOLUTIONS ON THE INTERNET OR ANY OTHER SOURCES (including tutors or students who have taken CSE 331 before)**. In order to ensure compliance with this, here are the various rules you will have to follow:

- For every question in a HW that you submit, you will have to **explicitly cite your sources**: i.e. state whether you consulted the KT textbook, material from piazza (if so specify which one), your lecture notes or some specific *mathematical* result from a previous course (if so, specify the earlier course as well as the result you consulted). If you did not use any of these sources they says so (e.g. by saying "None"). Note that using knowledge that you have gained from a previous course is considered to be not using a source (unless you are using a result without proof from an earlier course without proof).
- If while writing up your solution for a question you think you should cite some other source than the ones allowed above, it means you have consulted a source that was not allowed. In such a case, do **not** submit the question. If you are unsure, see the procedure outline in the clarification below.
- **If you do not cite your source, you will get a zero for the corresponding question irrespective of whether your actual solution is correct or not**.
- In the spirit of trust but verify, there will be specific questions in the Homeworks that are specifically designed to see if you used a source other than those allowed. Note that if you can find a solution easily online, then so can we!
- Deviating from the rules above will be considered cheating with a **penalty of an F grade for the course for the *first* violation of academic integrity**.

Note that the above does not mean that you cannot consult other sources to understand the basic material better: e.g. if you do not follow a lecture and want to read up that material from another source that is fine. However, *once you start working on a homework* the above rules come into effect.

Collaboration. Collaboration is generally allowed on the homeworks. Here is the collaboration policy:

- You are allowed to collaborate provided you have thought about **each problem for at least 30 minutes on your own**. This will help you in the exams.
- You can collaborate on any homework in a **group of size at most 3**, including yourself. Note that you cannot collaborate with different groups for different problems. You must write the name of *everyone* in your group on your submission.

- You can **only discuss the problems with your group till you come up with the proof ideas**: the detailed formal proof is something you should work on alone.
- Your submitted homework must be **written in your own words**. Everything, including the proof idea, has to be written up individually. In particular, at no point of time should you have in your possession the written homework of someone else.

Deviating from the rules above will be considered cheating with a **penalty of an *F* grade for the course for the *first* violation of academic integrity**.

Talking with non-collaborators. In addition to your collaborators, for your Homeworks you can talk to:

- the instructor and the TAs;
- any other student in the class (who is not a collaborator) but only up to the extent of understanding the statement of a question on a homework. You are not allowed to discuss your solutions or solution ideas with students who are not your collaborators.

Other than your collaborators and the two rules above, you should not discuss the homework questions with anyone else (including but not limited to tutors and students who have taken CSE 331 before). Deviating from the rules above will be considered cheating with a **penalty of an *F* grade for the course for the *first* violation of academic integrity**.

A Clarification. If you are not sure if you consulted with a source or someone that was not allowed, please check with the instructor before submitting your homework. If the instructor thinks that there was no inappropriate use of sources or collaboration, then you can go ahead and submit your homework. Otherwise you can just not submit your homework **without incurring any penalty**.

The line between collaboration and cheating can be blurry– when in doubt, play safe. Not only is cheating bad in principle, in practice it is highly unlikely that you'll do well in the exams unless you have worked hard on the homeworks on your own. It is highly recommended that you do not try to test my claim out on yourself.

For more rules and suggestions on homeworks, please refer to the Homework policy document, which can be found at

http://www-student.cse.buffalo.edu/~atri/331/fall15/handouts/hw-policies.pdf

Below are the due dates for the homeworks. They all assess student learning outcomes (a) and (j).

Quizzes

There will be two quizzes: both in class. The quizzes will be from **1:00-1:10pm** on **Monday, October 12** and **Monday, December 7**. The quiz will consist of one or two true/false (with justification) questions. Such questions will be on the exams but are not on homeworks and hence, these quizzes will be an opportunity for you to try and solve such questions before the exams (and under some time pressure). You will also gain experience working on true/false questions with a weekly such question that will be posted on piazza.

The quizzes are worth 3% of your grade. *However, if it is to your advantage, I will drop the quiz scores and bump up the homeworks to* 34% *of your grade.*

The quizzes will assess student learning outcomes (a) and (j).

Homework #	Handed out on	Due Date
0	Aug 31	Sep 4
1	Sep 11	Sep 18
2	Sep 18	Sep 25
3	Sep 25	Oct 2
4	Oct 2	Oct 9
5	Oct 9	Oct 16
6	Oct 30	Nov 6
7	Nov 6	Nov 13
8	Nov 13	Nov 20
9	Nov 20	Dec 4
10	Dec 4	Dec 11

Exams

The mid-term is worth 25% of your grade and the final exam is worth 35% of your grade. *However, if it is to your advantage, then the final exam will be worth* 60% *of your grade.*

No makeup exams will be given except in *provably extreme circumstances.* Please note the following additional policies/suggestions with respect to makeup exams:

- Notify your instructor 24 hours prior to the exam via e-mail or telephone (voice mail) if you are going to miss an exam. If it is medically *impossible* for you to give prior notice, please obtain a note from a physician detailing the period (and the reason) you were medically incapable of communicating with the instructor.
- If you miss an examination because of sickness or similar reasons, *visit a physician and obtain a note detailing the period and the reason you were medically incapable of taking the exam.*
- The exam dates are stated below. Please plan your travel and other activities accordingly.
- Exam times are stressful and one could forget about the exam time. Please make sure you arrange for multiple reminders so that you do not forget about the exam(s). This is another reason to religiously follow piazza as there will be numerous reminders about the exam when it gets close to the actual exam date.

The exams will assess student learning outcomes (a) and (j).

Mid-term exam

The mid-term exam will be split across two lectures. The in-class exams will from be **1:00-1:50pm** on **Monday, October 19** and **Wednesday, October 21** in the usual meeting place and time. The exam will be closed book and notes. However, you can bring in a single 8.5x11 inch paper (you can use both sides). (The sheet can be typed as long as the sheet is readable.) The exam is split over two lectures to give your appropriate amount of time to finish the exam.

Final exam

The final exam will be held in the classroom (NSC 215) on **Friday, December 18** from **noon-2:30pm**. (Note that the exam is for two and a half hours and not for three hours.) Again the exam will be closed book and notes but you can bring in *two* 8.5x11 inch sheets. (Again, the sheets can be typed as long as they are readable.)

Study time

In this course, as in any course, you are expected to put in additional time beyond the scheduled class times. Professors generally expect that for each credit hour a typical student will put in 2 – 3 hours of time **each week** outside of class. Since this is a 4 credit course that translates into 8 – 12 hours of time outside of scheduled times, **each week**. During this time you should review your lecture notes, attend office hours as needed, and work on assignments. As a rough guide, you should expect to spend **at least** the following time working on this course, **each week**:

lectures 3 hours

recitation 1 hour

individual/group study 3 hours

assignments 5 hours

Miscellaneous Notes

Here are some other policies/suggestions to keep in mind:

1. Your grade will solely depend on your performance in this semester: you will not get any opportunity to do extra work to improve your grade. It is your responsibility to make sure you understand what is expected of you. This course will require a fair bit of work so if you are busy this semester, please plan accordingly.
2. If there is a genuine reason for re-grading, please contact the person who graded your homework/exam within *a week* of when the graded material is handed out in class. In particular, if you do not pick up your graded material on time, you lose the opportunity to get back to us within the stipulated time period.
3. See this blog post from Fall 2009 on some tips on how to do well in this course (hint: work hard!)

   http://cse331.wordpress.com/2009/10/24/how-to-do-better-in-this-class/
4. The 6% of the grade consisting of piazza participation and mini project will be the easiest points in the entire course. Do not miss on those by forgetting about the deadlines.
5. Feel free to make up a group of up to three students and stick with it for all your homeworks. You can also use the group as your study group for the course. Piazza offers a mechanism to search for group-mates.

Accessibility Resources

If you have a diagnosed disability (physical, learning, or psychological) that will make it difficult for you to carry out the course work as outlined, or that requires accommodations such as recruiting note-takers, readers, or extended time on exams or assignments, you must consult with Accessibility Resources (25 Capen Hall, Tel: 645-2608, TTY: 645-2616, Fax: 645-3116, http://www.student-affairs.buffalo.edu/ods/).

You must advise your instructor during the first two weeks of the course so that we may review possible arrangements for reasonable accommodations.

Counseling Center

Your attention is called to the Counseling Center (645-2720), 120 Richmond Quad. The Counseling Center staff are trained to help you deal with a wide range of issues, including how to study effectively and how to deal with exam-related stress. Services are free and confidential. Their web site is

http://www.student-affairs.buffalo.edu/shs/ccenter/

Academic Integrity

Source: http://www.cse.buffalo.edu/undergrad/policy_academic.php

The academic degrees and the research findings produced by our Department are worth no more than the integrity of the process by which they are gained. If we do not maintain reliably high standards of ethics and integrity in our work and our relationships, we have nothing of value to offer one another or to offer the larger community outside this Department, whether potential employers or fellow scholars.

For this reason, the principles of Academic Integrity have priority over every other consideration in every aspect of our departmental life, and we will defend these principles vigorously. It is essential that every student be fully aware of these principles, what the procedures are by which possible violations are investigated and adjudicated, and what the punishments for these violations are. Wherever they are suspected, potential violations will be investigated and determinations of fact sought. In short, breaches of Academic Integrity will not be tolerated.

Departmental Statement on Academic Integrity in Homework Assignments

The following statement further describes the specific application of these general principles to a common context in the CSE Department environment, the production of homework assignments. It should be thoroughly understood before undertaking any cooperative activities or using any other sources in such contexts.

All academic work must be your own. Plagiarism, defined as copying or receiving materials from a source or sources and submitting this material as one's own without acknowledging the particular debts to the source (quotations, paraphrases, basic ideas), or otherwise representing the work of another as one's own, is never allowed. Collaboration, usually evidenced by unjustifiable similarity, is never permitted in individual assignments. Any submitted academic work may be subject to screening by software programs designed to detect evidence of plagiarism or collaboration.

It is your responsibility to maintain the security of your computer accounts and your written work. Do not share passwords with anyone, nor write your password down where it may be seen by others. Do not change permissions to allow others to read your course directories and files. Do not walk away from a workstation without logging out. These are your responsibilities. In groups that collaborate inappropriately, it may be impossible to determine who has offered work to others in the group, who has received work, and who may have inadvertently made their work available to the others by failure to maintain adequate personal security In such cases, all will be held equally liable.

These policies and interpretations may be augmented by individual instructors for their courses. Always check the handouts and web pages of your course and section for additional guidelines.

Departmental Policy on Violations of Academic Integrity

Any student accused of a violation of academic integrity will be so notified by the course director. An informal review will be conducted, including a meeting between these parties. After this review and upon determination that a violation has occurred, the following sanctions will be imposed. **It is the policy of this department that, in general, any violation of academic integrity will result in an F for the course, that all departmental financial support including teaching assistantship, research assistantship or scholarships be terminated, that notification of this action be placed in the student's confidential departmental record, and that the student be permanently ineligible for future departmental financial support.** A second violation of academic integrity will cause the department to seek permanent dismissal from the major and bar from enrollment in any departmental courses. Especially flagrant violations will be considered under formal review proceedings, which may in addition to the above sanctions result in expulsion from the University.

Suggestions or Comments?

I would be happy to get feedback from you. You can either

- Talk/send email to the instructor, or

- Use Piazza, or
- Fill in the online feedback form.

University at Buffalo
Department of Computer Science & Engineering
CSE 331 — Introduction to Algorithm Analysis and Design

I, _____ (PRINT name), acknowledge that I have read and understood the syllabus (and the homework policy document) for this course, CSE 331 *Introduction to Algorithm Analysis and Design*.

I also acknowledge that I understand the definition of academic integrity as outlined in the syllabus, and that I will minimally receive a grade of F in the course if I am found to have breached academic integrity, *even if it occurs for the first time*.

Signature: _____ Date: _____