



## CSE 355: Introduction to Theoretical Computer Science

(This syllabus borrowed text from <https://sites.google.com/a/asu.edu/cse355-spring-2015-fainekos/home>)

**(Fall 2017)**

*Information herein is subject to change.*

### 1. Course Description:

This course provides a first introduction to the theoretical concepts of Computer Science. The focus of the course is the study of abstract computing devices without targeting a specific programming language and/or computing platform. In particular, we will study:

- **Regular Language**, which model computing machines with finite fixed memory, and the class of regular languages, which is used for pattern matching languages
- **Context-free Language**, which facilitate declarative specifications of language syntax
- **Computability Theory**, which addresses the inherent limits of what can be solved by a computer (undecidability)
- **Complexity Theory**, which helps us measure the time and space used to solve a problem.

### 2. Course Information:

#### Lecture:

T & Th      3:00–4:15 PM      WGHL101

#### Recitation (TA):

W	9:40–10:30AM	BYAC190	Mehrdad Zaker Shahrak
W	10:45–11:35AM	BYAC190	Mehrdad Zaker Shahrak
Th	4:30–5:20 PM	BYAC190	Ze Gong

**Instructor:** Yu (“Tony”) Zhang

Email: [yzhan442@asu.edu](mailto:yzhan442@asu.edu)

#### Instructor Office Hours:

T & Th      5:30PM–6:30PM      BYENG 594

TA (Mehrdad Zaker Shahrak <[mzakersh@asu.edu](mailto:mzakersh@asu.edu)> & Ze Gong <[zgong11@asu.edu](mailto:zgong11@asu.edu)>)

**Office Hours:**

W	1:00PM—2:00PM	Centerpoint TA area	Mehrdad
F	11:00AM—noon	Centerpoint TA area	Mehrdad
M	2:00PM—3:00PM	Centerpoint TA area	Ze Gong
W	11:00AM—noon	Centerpoint TA area	Ze Gong

**Remarks on Electronic Communication:** For questions regarding personal issues, email **BOTH** the TA(s) and me. Before sending an email please follow the excellent advice <http://www.wikihow.com/Email-a-Professor>. For questions about class materials (e.g., homework, quizzes and etc.), see the respective sections below.

**3. Textbooks:**

**Required:** Introduction to the theory of computation, Michael Sipser,  
Thomson Course Technology, 3rd Edition, 2013

- **Note:** The publisher also provides an electronic version of the book through CourseSmart (<http://www.coursesmart.com/>). They also provide Apps for all platforms.
- **Note:** The 2nd Edition can still be used. However, you might have to consult with your classmates regarding the mapping of homework problems and pages between the two editions.
- **Note:** The 1st Edition is still acceptable. However, the 1st edition does not include any problem answers and it does not have as many examples and explanations as the 2nd and above editions. Also, you will have to consult with your classmates regarding the mapping of homework problems and pages between the 2 editions.
- **Note:** International editions of the textbook have different numbering in the exercises. If you are using the international edition, you will have to consult with your classmates regarding the mapping of homework problems and pages between the 2 editions.

**Supplementary reading:** will be announced on BB and via course website.

**4. Resources** (more will be added):

**Course web page** (will be active soon):

<http://www.public.asu.edu/~yzhan442/teaching/CSE355/>

**Schedule** (will be active soon and updated incrementally):

<http://www.public.asu.edu/~yzhan442/teaching/CSE355/schedule.html>

**On-line discussions and polls (Piazza):**

<http://piazza.com/asu/fall2017/cse355/home>

To sign up:

<http://piazza.com/asu/fall2017/cse355>

**5. Homework:**

Homework problems will be posted on Blackboard. Submission of homework is done **electronically** via Blackboard before the deadline (specified by date **AND** time). Both scanned and typed homework will be accepted. You are encouraged to use [Overleaf](#) to typeset your homework. Homework problem solutions are going to be discussed in the recitations after the homework due date.

**General policy:**

- If the homework is turned in late **AND within 48 hours of the deadline**, the maximum grade you can expect is **50%** of the total grade (if you do submit a late homework, you need to send **BOTH** me and the TA(s) an email with the homework as an attachment); **no grade will be given after 48 hours**. [Only under extremely rare situations will exceptions be made. Make sure to plan ahead.]
- If you are stuck, you must **FIRST** consult the textbook, handouts, and notes again to attempt your own solutions. If you are still stuck afterwards, you may post questions on Piazza (about where you are stuck) under the most relevant topic, consult online resources, or visit the TA(s) or me during office hours [however, make sure to post on Piazza **BEFORE** visiting us]. **However, at no point of time should you blatantly ask for solutions to homework problems on Piazza, or copy others' or online solutions.**
- If you find yourself unable to start **AFTER** consulting the textbook, handouts, and notes, visit the TA(s) or me during office hours.
- If you cannot come up with satisfactory solutions to homework problems, submit your attempted solutions.
- In some cases, the instructor or the TA may send you additional questions or ask you to clarify your solutions. If you get such a message, you must respond **within 2 business days**.
- Unless noted otherwise, the only acceptable submission format is **PDF**.
- If cheating is detected (e.g., directly copying others' or online solutions), then the homework score will be zero **AND** the final score will be lowered by an additional **5%**.
- For questions posted on Piazza, the TA(s) and me will be responding **after 1 business day** [if you plan to rely on our answers, make sure to plan ahead]. This will let your classmates enough time to attempt to answer your questions for class participation credit.
- The homework with the **lowest score** will be discarded, if the score is greater than

**25%** of the total grade; the homework with **the second lowest score** will also be discarded, if the score is greater than **50%**.

The homework will have an individual part and, **sometimes**, a group part [YOU MUST ANSWER BOTH PARTS, i.e., if you are submitting on your own the whole homework, you still need to submit the group part]. Individual homework exercises **must be solved and submitted individually**. Individual exercises are not challenging; therefore, collaborative work is NOT allowed. However, if you are stuck or you do not understand something, you are allowed to post a question on Piazza or consult online resources. However, again, at no point of time should you blatantly ask for solutions to homework problems on Piazza, or copy others' or online resources.

### **Group part policy:**

- It is **highly recommended** that you form/join a group. Groups can have **up to 3** members. A **SINGLE** member from the group must submit the group homework exercises **SEPARATELY** from his/her individual homework exercises (unless you are working by yourself). That is, each group submits only one solution for the group part.
- **The names of all the group members should be displayed** on the submitted group part.
- The base grade of the group part will be the same for all group members. However, the final grade for the group part for each student will be adjusted upward or downward based on feedbacks received through **peer assessment** [a score in [1-10] and a justification for the score] among the members of the group, **which must be submitted along with the submission of individual part**.
- Groups can be changed for every homework with a group part. If you want to join a group and cannot find one, use the respective discussion forum on Piazza.
- Collaboration between individuals who are not in the same group is **NOT** permitted and will be treated as cheating! However, if your group is facing a challenging problem and you are not making progress, then you are allowed to post questions on Piazza or consult online resources. The general guide still holds here: at no point of time should you blatantly ask for solutions to homework problems on Piazza, or copy others' or online solutions.

### **6. Exams and quizzes:**

Before each lecture (in most cases), there will be an online quiz for testing reading assignments (which will be assigned soon after the previous lecture) for your understanding of the materials that will be covered in the lecture. **You can take a quiz as many times as you like; only the latest submission will be graded. Quizzes with the lowest 5 scores with scores ABOVE 25% will be discarded.** This means that, quizzes with scores less than **25% will be counted towards your final score.**

- The class follows the Just-In-Time-Teaching (JITT) philosophy. This means that **you have to read the assigned material BEFORE coming to class** and answer a

brief online quiz. This will help me identify potential weaknesses and revise that day's lecture based on your answers and feedback. The quizzes will contain 2-4 very simple questions which are graded and which simply test whether you read the assigned material or not.

- The online quizzes must be completed ASAP (when it is available will be announced) **and BEFORE the corresponding classes begin.**

There will be one final exam and 3 mid-term exams. The mid-term exam with the **lowest score will be replaced** by the final exam (i.e., you will receive the same grades for the mid-term and final), if your final exam score is **greater than** the mid-term exam score **AND** the mid-term exam score is at least **30%**.

- **Mid-term:** In class, 1hr 15 min exams. In class, closed book and closed notes. A cheat sheet will be allowed which must be hand written. Nothing else must be on your desks besides your pen and/or pencil. Not even scrap paper. For scrap paper you can use space on the exam booklet (e.g., backside). The exact material for each midterm exam will be announced in class. Study guide will be distributed.
- **Final:** In class, closed book and closed notes. A cheat sheet will be allowed which must be hand written. Nothing else must be on your desks besides your pen and/or pencil. Not even scrap paper. For scrap paper you can use space on the exam booklet (e.g., backside). The final exam is comprehensive. Study guide will be distributed.
- Makeup exams will be given only for medical reasons or other personal emergency. You must submit verifiable documentation with your petition for a makeup exam.

#### **7. Project** (more details will be added):

- About automata theory; any programming language is allowed.
- This is an individual project. The code will be compared among all those who have ever submitted the programming project plus online resources. Detection of copied or isomorphic code will be performed.
- If cheating is detected, expect to get **at least 10% off your final grade**. Read also the plagiarism section below.

#### **8. Participation:**

- Contributing to both on-line and in-class discussions. This should be an activity throughout the semester.
- Correcting your instructor and/or TA(s) in class!
- Helping others figure out fallacies in their line of thought when attempting to solve a problem.
- Giving hints to your classmates, but not the complete answer.
- Getting positive feedback from your group members and peers on the peer

assessment forms.

### 9. Grading:

Homework	20%
Project	10%
Quizzes	10%
Mid-term Exam	30%
Final Exam	35%
Participation	3%
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Total	108%

Final grades will be determined as follows:

A+	>100%		B-	[75-80)%
A	[95-100)%		C+	[70-75)%
A-	[90-95)%		C	[65-70)%
B+	[85-90)%		D	[55-65)%
B	[80-85)%		F	<55%

### 10. Grading Questions:

If you believe that there is a mistake in grading, you must inform the TA(s) or the instructor (who graded the work which will be made clear on the work returned) **within 2 business days** when the graded work was returned to you.

### 11. Attendance:

I do not have an attendance policy. Come to class only if you like. Most of the material are available (or will be available) on-line.

However, if you skip classes, you do miss the chance for in-class participation bonus.

If you cannot come to an exam, then I will need some back-up documentation from a third party, e.g., a doctor, to schedule a make-up exam. Notification: If a student has to miss a class/test/homework for reasons out of his/her control, he/she should send the instructor an email as soon as possible, but no later than the class/deadline. Bring him an official document (e.g., if you are sick, a doctor's note stating that you are unable to attend/work for a specific period).

## 12. Class evaluations and feedback:

I take very seriously class evaluations and feedback. During the semester, I will be posting surveys on Blackboard for feedback on both the course organization and the course content. I will appreciate it if you respond to these surveys. Ideally, the changes I implement will help you better succeed in the course.

Finally, it is **extremely important** that you respond in the final anonymous survey solicited by the university at the end of the school year. The overall feedback helps me make changes for the next year.

## 13. Honors Contract:

- 8-10 page survey paper with basic theory and 1-2 applications
- Using the theories learned to analyze 1-2 real-world applications
- Build software tools to solve a realistic problem using the theories learned
- Come up with your own idea and discuss it with the instructor!

## 14. Academic Dishonesty:

- Your work for this course must be the result of your own individual effort or - when permitted - the result of your group. Having said that, you are allowed to discuss problems with your classmates, the TA(s), or me, but you must not blatantly copy others' solutions.
- Copying (or slightly changing) solutions from online sources, other books or your friends is **easily detectable**.
- If such copying is detected, then a zero grade is applied to the respective assignment, -5% to the final grade, and a formal report may be filed!
- Do not forget that if you can find an answer online, then so can we! Actually, if there is an answer online, then we download 10 versions and we check your answers for copying.