

**Syllabus**  
**CSE 355: “Introduction to Theoretical Computer Science”**  
**(Spring 2025)**

**1. Course Description and Objectives:**

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 (decidability)
- Complexity Theory, which helps us measure the time and space used to solve a problem.

Notice: Any information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advance notice.

**2. Contact Information:**

Lecturer: Heni Ben Amor, Ph.D.  
Centerpoint 203-07  
Tel: 404-234-8507  
Email: [hbenamor@asu.edu](mailto:hbenamor@asu.edu)

Office Hours: Monday 3:00-4:00pm

TA: Sana Habib ([shabib3@asu.edu](mailto:shabib3@asu.edu))

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**3. Remarks on Electronic Communication:** For questions regarding personal issues, email first the TA(s) if you have any technical questions. Any questions that are regarding your personal situation in the course should be sent to the lecturer. 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.

**4. Readings and Textbook:**

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 1: 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 2: 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.

### 5. Participation:

- Answering questions in class!
- Contributing to both on-line and in-class discussions.  
This should be an activity throughout the semester.
- 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.

### 6. Schedule:

Week 1 – Introduction and Finite Automata  
 Week 2 – Deterministic Finite Automata  
 Week 3 – Non-deterministic Finite Automata  
 Week 4 – Regular Expressions  
 Week 5 – Non-regular Languages and Context Free Grammars  
 Week 6 – Pushdown Automata  
 Week 7 – Midterm and CFL  
 Week 8 – Pumping Lemma  
 Week 9 – Turing Machines 1  
 Week 10 – Turing Machines 2  
 Week 11 – Decidability  
 Week 12 – Reducibility  
 Week 13 – Midterm and Refresher  
 Week 14 – Complexity Theory  
 Week 15 – P and NP  
 Week 16 – Non-traditional Computing Paradigms

### 7. Grading Policies:

Classroom attendance is mandatory in this course. Overall, the grade will be calculated according to the following schema:

- Participation in classroom - 10%
- Homeworks and assignments - 20%
- Two Midterms: 40%
- Final Exam: 30%
- Additional points via an optional project

Grading table:

A+	>99%		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%

## **8. Absence & Make-Up Policies**

Classroom attendance is mandatory in both the class, as well as the recitations. Accommodations will be made for religious observances provided that students notify the instructor at the beginning of the semester concerning those dates. Students who expect to miss class due to officially university-sanctioned activities should inform the instructor early in the semester. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences. The preceding policies are based on ACD 304–04, “Accommodation for Religious Practices” and ACD 304–02, “Missed Classes Due to University-Sanctioned Activities.”

## **9. Classroom Behavior**

Cell phones and pagers (must be/or state alternative rule) turned off during class to avoid causing distractions. The use of recording devices is not permitted during class. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students.

### **Disability Accommodations**

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

## **10. Academic Integrity:**

Any kind of plagiarism or cheating attempt will be severely dealt with. This includes attempts at reusing text from uncited sources, as well as rephrasing existing text. Please try to make sure that you express your ideas and thoughts using your own words! Code from third parties (including fellow students) can only be used if it is properly labelled. When using third party soft-ware, please also make sure to specify how exactly it is used in your project and by how much it contributes to the overall size of the project. More details on the Academic Integrity Policy can be found under the following link: <https://provost.asu.edu/sites/default/files/AcademicIntegrityPolicyPDF.pdf>.

## **11. Sexual Discrimination**

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish discuss any concerns confidentially and privately.