Howdy!!

Prerequisites?
Self-contained course with all the knowledge provided in the course lectures, lab projects and textbook. Some projects will require basic skills in C++/JAVA/Python etc. Basic background in CSCE 221 will be helpful.

Curiosity
Enthusiasm

Course Description
Introduction to computer systems from programmer’s perspective: simple logic design, data representation and processor architecture, programming of processors, memory, control flow, input/output, and performance measurements; hands-on lab assignments.

IT’S IN THE SYLLABUS
Learning Outcomes

1. To integrate key notions from Algorithms + Computer Architecture + OS + Compilers + Software Engineering
2. To explore various ideas and techniques to answer how computer works, and how are they designed
3. To actively apply new concepts as we learn, via fascinating hands-on lab projects
4. To constructively build a modern virtual general-purpose computer system from the ground up that you will be proud to use and share
5. To gain many cross-section views of the computing field, from the bare-bone details of switching circuits to the high level abstraction of object-based software design.
6. To simulate digital logic circuits using a simple Verilog-like hardware description language
7. To design a cool gaming application using an easy-to-learn JAVA-like language running on the computer we built
8. To work as a part of team in equal contribution, maintain professional conduct in an inclusive environment, and manage time efficiently while developing key critical-thinking, communication, and decision-making skills

...if I had to average all of your understanding, progress, success, and performance into a single alphanumeric character, it’d be this, but really this is over-simplifying things because learning is messy and understanding is highly dynamic.

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Lab Projects</td>
<td>40%</td>
</tr>
<tr>
<td>Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Exams</td>
<td>45%</td>
</tr>
<tr>
<td>Take-home Quizzes</td>
<td>5%</td>
</tr>
</tbody>
</table>

Grade Breakdown

<table>
<thead>
<tr>
<th>% Total</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 90</td>
<td>A</td>
</tr>
<tr>
<td>80-89</td>
<td>B</td>
</tr>
<tr>
<td>70-79</td>
<td>C</td>
</tr>
<tr>
<td>60-69</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 60</td>
<td>F</td>
</tr>
</tbody>
</table>
TEXTBOOK
The Elements of Computing Systems: Building a Modern Computer from First Principles
Noam Nisan, Shimon Schocken
MIT Press, 2005
Recommend buying for pure joy, 1st half free online

REFERENCE
Digital Design, 2nd Ed
Frank Vahid
Wiley Publication, 2010
Referenced in a limited capacity, selected topics

SOFTWARE
From Nand to Tetris, https://www.nand2tetris.org/
Noam Nisan, Shimon Schocken
Official website to accompany the textbook, Comprises of book chapters from Ch 1-6, Download and install software suite to access all simulators on Windows, Unix, MacOS

COURSE CONTENTS
CSCE 312, piazza.com/tamu/fall2018/csse312504505/home
All course lecture notes, project handouts, announcements, student queries, exam and quiz solutions, staff contact will be posted here, good student discussions and responses will be endorsed and tracked, direct your subject queries to entire class and teaching staff for quicker response (DO NOT share your code or solutions in public posts), post private piazza messages to any/all the teaching staff for personal matters/grading queries, option to be anonymous, Avoid direct email to teaching staff unless required

SUBMISSION
CSCE 312,
Submission channels with due date and time will be created, Upload and submit your lab projects, and scanned copy of take-home quizzes, Grades and feedback will be published here. Recommend using Firefox/Chrome as browser

SCRIBING
CSCE 312,
Every scribe team will be assigned a lecture chapter for collaboration on creating concise study notes, and guides, presenting information creatively with figures/infographics and, surveying interesting facts or current articles, extended concepts etc., to be meant for publishing & sharing with the entire class for peer review and improvement, helpful for exam and quiz review

COMPUTER
Personal Laptop
BYOD to every class and lab. Check system requirements for compatibility to run nand2tetris softwares/simulators for doing Lab projects, to demonstrate lab projects, to code in HDL, JAVA / C++/ Python etc, and JACK for the game
Make-up, Late Work & Attendance

Exam Make-up
Missed exams will be eligible for make-up only for university excused absences.

Valid documentation must be submitted by the student as per Student Rules below and must be acknowledged by the instructor prior to making up a missed exam.

If advanced notice is not feasible (e.g., accident, or emergency), the student has 2 business days after the excused absence to provide notification, failing which it will be categorized as an unexcused absence.

In event of an unexcused absence, a zero will be assigned for the missed exam.

Make-up for missed exam, if approved by the instructor, needs to be completed no later than 30 calendar days from the last day of initial excused absence.

For more details on university excused absences and procedure, refer to Student Rules in [https://student-rules.tamu.edu/rules3/](https://student-rules.tamu.edu/rules3/).

Late Submission
Applies to assigned Lab projects, and Take-home quizzes with announced due date and time.

Submission time is the timestamp recorded while uploading the assigned work on Campus.

Late work is defined when the submission time exceeds the due date and time, resulting in a grading penalty described here.

In event of missing the due date and time resulting from university excused absence, a rescheduled due date and time with no grading penalty, must be requested by the student and approved by the instructor, provided valid documentation or notification, wherever applicable, is provided within 2 business days after the absence.

Late work can not be accepted once solutions are shared or discussed in class, or lab.

Attendance
Course is structured with class group activities and lab quizzes that will regularly track student's attendance.

Class group activities are meant to support lecture content, to drive class discussions and to promote a cooperative learning atmosphere.

There will be no make-up for unexcused absence, but extra-credit assignment can be provided towards participation grades in the event of university excused absence, as per Student Rules.

A student can boost one's participation grades by active involvement and substantial contribution in facilitating Piazza discussions/queries, and creating high quality notes in terms of both content and presentation for the scripted tasks.

Grading Penalty

\[ G = G \times (0.9999)^m \]

\( G \) = Grade achieved for the assigned work

\( m \) = minutes late in submission

<table>
<thead>
<tr>
<th>Minutes Late</th>
<th>Max Grade</th>
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<tbody>
<tr>
<td>5</td>
<td>99.9%</td>
</tr>
<tr>
<td>60</td>
<td>98.8%</td>
</tr>
<tr>
<td>1440 (1 day)</td>
<td>75%</td>
</tr>
<tr>
<td>2880 (2 days)</td>
<td>56.2%</td>
</tr>
<tr>
<td>4320 (3 days)</td>
<td>42.1%</td>
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</tbody>
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Weekly Agenda
(subject to change)

#1 Boolean Logic
#2 Boolean Arithmetic
#3 Sequential Logic Design
#4 Sequential Logic Design
#5 Machine Language
#6 Machine Language
#7 Midterm Review, MIDTERM EXAM
#8 Assembler
#9 CPU Architecture, Virtual Machines
#10 Virtual Machines, Compilers
#11 Compilers
#12 CPU Pipelining, Q-Drop
#13 Memory Heirarchy, Thanksgiving
#14 Virtual Memory, Cache Memory
#15 Game Project Demo, Reading Day
#16 FINAL EXAM

Important Dates
Midterm Exam : Oct 11
Q-Drop : Nov 16
Reading Day : Nov 21
Thanksgiving Break : Nov 22-23
Redefined Days : Dec 3-4
Reading Day : Dec 6
Final Exam : 1-3pm Dec 11

Lab Projects
Week 1 : Setup, HDL
Week 2 : P1, P1
Week 3 : P1, P2
Week 4 : P2, P3
Week 5 : P3, P3
Week 6 : P3, P4
Week 7 : P4, -
Week 8 : P5, JACP
Week 9 : P6, P6
Week 10 : P6, P5
Week 11 : P5, P7
Week 12 : P7, P7
Week 13 : Game, na
Week 14 : Game, Game
Week 15 : na, -
(subject to change)

P, Project
- buffer day
na: reading/redefined day
MEET THE STAFF

Jyotikrishna "JD" Dass
PhD student, Dept. of CSE
- HRBB 514B, W: 3-5 PM
- E Use Piazza private post
- W http://people.tamu.edu/~jyoti1991/

Zachary Steer
Bachelors student, Dept. of CSE
- HRBB 129, M: 9-10 AM, T: 9-9:30 AM, W: 5:30-6:30 PM, R: 9-9:30 AM
- E Use Piazza private post

Kavya Sree BVS
MS student, Dept. of CSE
- HRBB 501C, T-R: 2-3 PM
- E Use Piazza private post

Feras Khemakhem
Bachelors student, Dept. of CSE
- HRBB 129, W: 5:30-7 PM, F: 9-10 AM
- E Use Piazza private post

AGGIE HONOR CODE

An Aggie does not lie, cheat, or steal, or tolerate those who do

For additional information please visit http://aggiehonor.tamu.edu

Americans with Disabilities Act Policy Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information visit http://disability.tamu.edu/

ACKNOWLEDGEMENT

The course owes its existence to the Nand2Tetris organizers, Prof. Nisan and Prof. Schöcken [http://www.nand2tetris.org]. The material has been adopted and enhanced by Dr. Aakash Tyagi for CSE 372 at Texas A&M University, College Station. The lecturer expresses his deepest gratitude to Dr. Tyagi for inculcating curiosity in learning, and passion for teaching, which has led the instructor from his previous TA role(s) to being offered the current GAL position for Fall 2018. The lecturer has profoundly grown under Dr. Tyagi’s mentorship, friendship, and encouragement, and continues to strive towards success in graduate studies and future endeavors.

Sneak Peek into New Zackery
https://www.facebook.com/dass.jfdak/posts/102164022385655579