

**Computer Architecture COSC 2334
Department of Computing Sciences
Summer 2017**

A. COURSE INFORMATION

Course number/section: COSC 2334
Class meeting time: TR 12:00 p.m. – 2:30 p.m.
Class location: CA-228
Course Website: <http://sci.tamucc.edu/~dkar/summer2017/2334/>

B. INSTRUCTOR INFORMATION

Instructor: Dr. Dulal Kar
Office location: CI 321
Office hours: 2:30 p.m. – 4:00 p.m. (MTWR)
Telephone: 361-825-5878
e-mail: dulal.kar@tamucc.edu
Appointments: Required for meetings beyond office hours

C. COURSE DESCRIPTION**Catalog Course Description**

An overview of computer architecture, which stresses the underlying design principles and the impact of these principles on computer performance. General topics include design methodology, processor design, control design, memory organization, system organization, and parallel processing.

D. PREREQUISITES AND COREQUISITES

Prerequisites: COSC 1435 and MATH 2305

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Computer System Architecture (3rd Edition) by M. Morris Mano, Prentice-Hall, Inc. (ISBN: 0131755633)

Optional Textbook(s) or Other References

None

Supplies

None

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course's student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Describe how data is represented internally in different computer platforms.
2. Explain functions of various logic gates and flip-flops that are used in the design of digital components.
3. Apply K-maps and Boolean Algebraic techniques in designing simplified digital circuits.
4. Explain functions and usages of various digital components such as decoders, encoders, multiplexers, adders, flip-flops, registers, etc. and use them in design.
5. Explain the design of ALUs using components such as adders, multiplexers, etc.
6. Explain and use processor design techniques that include control unit design.
7. Explain various computer systems including accumulator machines, stack machines and general purpose register machines, instruction types, instruction formats, and addressing modes.
8. Explain techniques of pipelining used in computer architecture.
9. Explain memory system and performance improvement using cache memory.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Lectures using online electronic documents and slides.

H. MAJOR COURSE REQUIREMENTS AND GRADING

This is an intermediate course. However, this is a difficult course that demands all students attend all classes! Regular completion of all reading, homework, and other outside assignments, are absolutely essential for success in this course. We will follow the text generally, but non-text material may also be included in the lectures. Except the final exam, all assignments, quizzes and exams will be given during the class hours. You are responsible for all material presented during the lecture.

Assignments: About eight to ten quizzes and homework assignments will be given. Partial credit will be given for incomplete assignments. Assignments will significantly build on the material from the lectures. Hard copies of the assignments will be handed out in the class.

Exams: There will be three exams. The dates of midterm exams will be announced in the class. The final exam will be comprehensive and will be given on the last day of the summer

session for the course. Exams will cover all lecture and reading material from the text. Often exam and quiz questions are similar to the problems assigned in homework assignments.

ACTIVITY	% of FINAL GRADE
Exam 1	20
Exam 2	20
Final Exam	30
Homework and Quizzes	30

I. COURSE CONTENT/SCHEDULE

DATE (BY DAY OR WEEK)	<u>TOPIC</u>	CHAPTER(S)	ASSIGNMENTS
Weeks 1-2	Data Representation, Boolean Algebra, Map Simplification, Combinational Circuits	Chapter 1 and Chapter 3	HW1, HW2
Weeks 2-3	Digital Components	Chapter 2	HW3
	Midterm Exam 1		
Weeks 3-4	Sequential Circuits, Register Transfer and Microoperations,	Chapter 1, Chapter 2, and Chapter 4	HW4, HW5
Weeks 4-5	Central Processing Unit	Chapter 8	HW6
	Midterm Exam 2		
Weeks 5-6	Basic Computer Organization and Design	Chapter 5	HW7
Weeks 6-7	Pipeline and Vector Processing, Memory Organization	Chapter 9 and Chapter 12	HW8
	Final Exam		

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES**Attendance/Tardiness**

You must attend all classes. You are responsible for any materials covered or handed out or announcements made for the tests, quizzes, and homework assignments in your absence. Records of your attendance will be maintained and reported to the university. Students found missing classes without the instructor's permission will be automatically withdrawn from the course. Students are responsible for all materials covered in class and assigned. Should a student be absent from class, it is his/her responsibility to get the notes, etc. for that missed class. More important, should there be assignments, it is the student's responsibility to obtain such assignments. No excuse will be accepted for assignments not turned in because the student was absent when it was due.

Late Work and Make-up Exams

All the assignments are due at the beginning of the class on the due date. If the student is absent on the assignment due date, it is the student's responsibility to make sure that the assignment is submitted on the designated date. An assignment that is turned in after the class on the due date is considered one day late. There is a penalty for late submissions. Late assignments will be counted 20% off for each day after the due time. No credit will be given if an assignment is submitted after 5 days. If you have not completed your assignment by the due date, you should submit the work you have done for partial credit. No work will be accepted once the graded work has been returned or the solution has been disclosed to the class, except for unusual circumstances. Exams must be taken on the hour they are scheduled. In the event, if you cannot attend the class to take the exam due to some emergency or some unavoidable situation (such as serious illness, death in the family, participation in university sports, religious observations, and so on) you must notify me as soon as possible before the exam and also you must validate your absence by providing me a document (e.g., with a letter from your doctor).

Extra Credit

None.

Cell Phone Use

Set your cell phone/electronic device in silent mode when you are in class.

Laptop Use

You can use your laptop to view course documents or slides.

Food in Class

Not allowed.

Missed Exam

No makeup exam will be given without prior agreement.

Participation

You are encouraged to ask questions related to course topics that can help you and others attending the class.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**

University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one's own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**

Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**

Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**

The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that

must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (<http://www.tamucc.edu/academics/calendar/>) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**

As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at <http://sci.tamucc.edu/students/GradeAppeal.html>. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**

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 call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

<http://disabilityservices.tamucc.edu/>

- **Statement of Academic Continuity**

In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However,

students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

A. OTHER INFORMATION

- **Academic Advising**

The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College's Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.