The UNIVERSITY of OKLAHOMA
GALLOGLY COLLEGE OF ENGINEERING
SCHOOL OF COMPUTER SCIENCE

READ ME
1. This Document Details the Course Content (Syllabus)
2. Cells with a red triangle contain a note; hover to read it.

1	**Course Code**	CS3203
2	**Course Name**	Software Engineering
3	**Version**	1.1

4	**Name(s) of Academic Staff**				
		Instructor	Abdulhak, Mansoor	**Email**	m.hak@ou.edu
		Teaching Assistant	Haron Mungiria	**Email**	hmungiria@ou.edu
		Teaching Assistant		**Email**	

5	**Semester**	Fall
6	**Year**	2025
7	**Program Level**	BS
8	**Prerequisite Course**	CS 2413 or CS 2414 and CS 2813 or Math 2513

9	**Contact Hours**	**Delivery Methods**		**Hour per week**		**Implementation**	**Date**	**Time**	**Location**
		In-Person (Student Center Learning) Activities	Lecture	3	units	(3 hour(s) per week)	MWF	11:00 am - 11:50 am	Gallogly Hall 127
			Tutorial	0	units	(0 hour(s) per week)			
			Laboratory	0	units	(0 hour(s) per week)			
			Supervision	0	units	(0 hour(s) per week)			
			Online Learning	0	units	(0 hour(s) per week)			
			Out Class	6	units	(6 hour(s) per week)			
			Students Hour	2	units	(2 hour(s) per week)	MW	09:30 10:30	Devon Energy Hall 234 or Virtually
			Final Exam	0	units	(2 hour(s) per Sem)	M Dec 15	01:30 pm - 03:30 pm	Gallogly Hall 127

10	**Course Description**	This course focuses on modern software engineering techniques used in the development of software products. You will learn how software products are developed incrementally using agile methods, executes on the cloud, security is critical and it will be maintained and managed by a DevOps team. Within a group format, you will employ these concepts to design and document software products, as well as explore topics related to professional ethics, responsibility, and legal issues.

11	**ABET Student Outcomes**	By the end of semester, students should be able to:
	ASO 3	Communicate effectively in a variety of professional contexts.
	ASO 4	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
	ASO 5	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
	N/A	N/A
	N/A	N/A
	N/A	N/A

12	**Assessment Methods**	**Methods**	**Item**	**Weighting**	**ASO 3**	**ASO 4**	**ASO 5**	**N/A**	**Letter Grades**	
		Project	Ticket1_ProductVision	5%	√				≥ 90	A
			Ticket2_ScrumPlan	5%			√		80-89	B
			Ticket3_CodeManagement	5%	√				70-79	C
			Ticket4_ArchitectureDesign	5%	√				60-69	D
			Ticket5_SprintExecution	30%			√		< 60	F
		Assignments	ASSIGN1_USECASE	10%		√				
			ASSIGN2_TESTCASE	10%		√				
		Midterm Exam	Multiple Choice	10%	√	√				
		Final Exam	Free Response	20%	√	√				
		Total		**100%**						

13	**Learning References**		
		Required 1	Sommerville, I (2019), Engineering Software Products: An Introduction to Modern Software Engineering, 1st edition, Pearson Education
		Supplementary 2	David Kung. (2024). Software Engineering, 2nd Edition. McGraw Hill.
		Supplementary 3	Sommerville, I. (2015). Software Engineering. Addison-Wesley.
		Supplementary 4	Pressman, R. S., & Maxim, B. R. (2019). Software Engineering: A Practitioner's Approach.

Notes:	Instructor reserves the right to modify or update the content on this platform at any time without prior notice. Users are encouraged to check for updates regularly. Your continued use of the platform after changes are made constitutes acceptance of those changes.

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READ ME

1. This Document Details the:
a) **Week**: Indicates the number of the week., b) **Chapter**: The chapter from the required textbook., c) **Syllabus**: The specific topic to be discussed.,
d) **Class Activity**: We have 3 sessions each week; the number indicates the session (e.g., 1 indicates activities during the 1st session).
e) **SWEBOK v4.0**: Refers to the Software Engineering Body of Knowledge, version 4.0, which outlines the knowledge areas covered this week.,
f) **Assessment Method**: The type of assessment (e.g., quiz, assignment) assigned for this week, g) **Total Marks**: The weight or points assigned to this week's activities
2. Cells with a red triangle contain a note; hover to read it.

Week	Chapter/Topic	Syllabus	Class Activity	SWEBOK v4.0	Assessment Method	Total Marks
1	Software Products	1.1 The product vision 1.2 Software product management 1.3 Product prototyping	1.1 Introduction 1.2 Communication Activity 1.3 Group forming 2.1 Group Meeting to complete tasks 3.1 Presenting (Ticket 1)	Software Engineering Professional Practice (KA)	Ticket 1 Group Presentation Evaluation	5
2	Agile Software Engineering	2.1 Agile methods 2.2 Extreme programming 2.3 Scrum	1.1 Holiday 2.1 Introduction 3.1 Group Meeting (Ticket 2)	Software Engineering Management (KA)	Ticket 2 Scrum Plan	5
3	DevOps and Code Management	10.1 Source code management	1.1 Introduction 2.1 Group Meeting 3.1 Preparing (Ticket 3) Prepare the Git Repository (README) Practice Branching, Squashing, Rebasing and Merging	Software Configuration Management (KA)	Ticket 3 Branching & Merging Video Tutorial	
4	DevOps and Code Management	10.2 DevOps automation 10.3 DevOps measurement	1.1 Introduction 2.1 Group Meeting to complete tasks 3.1 Reviewing (Ticket 3)	Software Configuration Management (KA)	Review Ticket 3	5
5	Features, Scenarios and Stories	3.1 Personas 3.2 Scenarios	1.1 Introduction (Persona Activity) 2.1 Group Meeting 2.2 Writing Requirements: Stories and Features 2.3 Writing User-Experience Scenarios Clarifying User Goals 3.1 Review product GIT & IaC (README & Backlog)	Software Requirements (KA)	Ticket 5 Code Review Form-1	10
6	Features, Scenarios and Stories	3.3 User stories 3.4 Feature identification	1.1 Introduction 2.1 Group Meeting 2.2 Discuss the product Feature 3.1 Preparing USE CASE component	Software Requirements (KA)	Assignment 1 Use Case Template (PeerReview Form)	10
7	Testing	9.1 Functional testing 9.2 Test automation	1.1 Introduction 2.1 Group Meeting 2.2 Discuss the product unit testing 3.1 Preparing TEST CASE component	Software Testing (KA)		
8	Testing	9.3 Test-driven development 9.4 Security testing 9.5 Code reviews	1.1 Introduction 2.1 Group Meeting 3.1 Preparing TEST CASE component	Software Maintenance (KA) Software Quality (KA)	Assignment 2 Test Case Template (PeerReview Form)	10
9	Software Architecture	4.1 Why is architecture important? 4.2 Architectural design 4.3 System decomposition	1.1 Introduction 2.1 Group Meeting 3.1 Design the product architecture	Software Architecture (KA)	Midterm	10
10	Software Architecture	4.4 Distribution architecture 4.5 Technology issues	1.1 Introduction 2.1 Group Meeting 3.1 Reviewing product unit testing (Progress Sprint 1-2)	Software Design (KA)	Ticket 5 Code Review Form-2	10
11	Cloud-based Software	5.1 Virtualization and containers 5.2 Everything as a service 5.3 Software as a service 5.4 Multitenant and multi-instance systems 5.5 Cloud software architecture	1.1 Introduction 2.1 Group Meeting 3.1 Preparing Everything as Services	Software Construction (KA) Software Engineering Operations (KA)		
12	Microservices Architecture	6.1 Microservices 6.2 Microservices architecture 6.3 RESTful services 6.4 Microservice deployment	1.1 Introduction 2.1 Group Meeting 3.1 Presenting (Ticket 4)	Software Construction (KA) Software Engineering Operations (KA)	Ticket 4 Architectural Design	5
13	Security and Privacy	7.1 Attacks and defenses 7.2 Authentication 7.3 Authorization 7.4 Encryption 7.5 Privacy	1.1 Introduction 2.1 Group Meeting 3.1 Develop the product Sprint 2	Software Security (KA)		
14	Reliable Programming	8.1 Fault avoidance 8.2 Input validation 8.3 Failure management	1.1 Introduction 2.1 Group Meeting 3.1 Develop the product Sprint 2	Software Engineering Professional Practice (KA)		
15	Pre-finals week	Code Review Sprint 2	Code Review Sprint 2	Software Engineering Professional Practice (KA)	Ticket 5 Code Review Form-3	10
16	Exam	Relax Week	Do nothing		Final Exam	20
17	**Have great holidays**					
					Total Marks	**100**

Notes: ***Nothing for now**

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1. This Document Details the:
a) **Week**: Indicates the number of the week., b) **Topic**:The chapter from Section 2.1 of the textbook, focusing on the specific topic to learn, c) **Date**: The specific start date of the week,
d) **Hours**: The estimated hours required per week for an average student to complete the activities e) **Questions**: Prepared questions to help you understand the topic,
f) **Skills**: The skills this week aims to help you gain or improve, g) **Comments**: Details of the week's activities, including any deadlines if applicable.

Weeks	Topic	Dates	Hours	Questions	Skills	Comments
1	Software Products	25-Aug	9	01 What Is the domain of the System? 02 What is the Purpose and Goals of the System? 03 Who Are the Primary Stakeholders?	Observation Structuring correct Questions Research Understanding others	1. Knowing your classmate schedule to form groups 2. Prepare 2 Multiple Choice Questions (CH1) 3. Ticket 1 Submission (Jan 17th/8:00 am) 4. Presentation Form 5. 360 Feedback Form
2	Agile Software Engineering	1-Sep	9	1. What technologies should we use for design, development, testing, and deployment, and why are they suitable? 2. How do I effectively use these tools? Do I need to enhance my skillset to leverage them? 3. What free and accessible resources are available for learning these technologies? 4. Are there open-source technology alternatives that can be utilized? 5. What are the key artifacts required for product development? 6. Who is responsible for each task in the project? 7. What are the deadlines for each deliverable?	Adoption Fast Learning Planning Time Control Team Player	1. Identifying the group skills (who is good at what) 2. Prepare 2 Multiple Choice Questions (CH2) 3. Ticket 2 Submission (Jan 24th/8:00 am) 4. Evaluation Form 5. 360 Feedback Form
3	DevOps and Code Management	8-Sep	9	01 What is branching strategy? 02 What practices are followed when creating and reviewing pull requests? 03 How to commit a clear and descriptive messages? 04 How to merge the code and what are the conflicts might arise? 05 How is versioning handled and what is the process for managing releases? 06 Review, Squash and Rebase and identify the differences with Commit in GIT.	Organizational Skills Version Control Knowledge Transfer	1. Finding my code mate within my group 2. Ticket 3 Submission (Feb 3rd/8:00 am) 3. 360 Feedback Form
4	DevOps and Code Management	15-Sep	9	01 What aspects of the software development lifecycle (SDLC) or infrastructure are currently automated, and to what extent? 02 What is DevOps and why I should know? 03 What tools and technologies are being utilized for automation in the DevOps pipeline? 04 How is continuous integration CI and continuous deployment CD (CI/CD) implemented in the development process? 05 What key performance indicators (KPIs) or metrics are currently being measured in the DevOps pipeline?	Preparing README to setup the DevOps Scripting and Programming Configuration Management Monitoring and Logging	1. Prepare 2 Multiple Choice Questions (CH10) 2. Submit Ticket 3 Review (Feb 07th/11:00 pm) 3. Prepare a README.md file check this link https://tiloid.com/p/readme-md-the-ultimate-guide
5	Features, Scenarios and Stories	22-Sep	9	01 What Are the Functional/Non Requirements? 02 What Data Is Involved? 03 What Are the Existing Workflows and Processes? 04 What Are the Legal and Regulatory Requirements? 05 What Are the User and Customer Expectations?	System Analysis and Design Leadership Creativity	1. Prepare 2 Multiple Choice Questions (CH03) 2. Use Case (Check Use-case Template) 3. Ticket 5 Code Review Form-1 (Feb 14th/11:00 am) 4. Submit README & Backlog screenshot (Feb 14th/12:00 pm)
6	Features, Scenarios and Stories	29-Sep	9	06 What Are the Pain Points and Challenges? 07 What Are the Future Trends and Needs? 08 What Are the Constraints? 09 What Is the System's Scalability and Growth Potential? 10 How Will the System Be Maintained and Supported?	Programming Proficiency Domain Knowledge Attention to Detail	1. Submit Assignment 1 (Feb 24th/08:00 am)
7	Testing	6-Oct	9	01 What Is the Expected Behavior? 02 What Are the Test Cases? 03 How Can the Code Fail? 04 What Is the Minimal Code to Pass the Tests?	Understanding of Testing Principles Refactoring and Code Design Continuous Learning	1. Prepare 2 Multiple Choice Questions (CH09)
8	Testing	13-Oct	9	01 Is the code easy to read and understand? 02 Are variable and method names descriptive? 03 Are there comments where necessary to explain complex logic? 04 Are functions/methods appropriately sized and focused on a single responsibility? 05 Is the code efficient, how to improve it?	Technical Proficiency Empathy (understanding the coder is a human)	1. Submit Assignment 2 (Mar 10th/8:00 am)
9	Software Architecture	20-Oct	9	01 What are the main user interactions or use cases to be represented in the sequence diagram? 02 Which objects or components are involved in the sequence, and what roles do they play? 03 What messages or events are exchanged between objects during the sequence? 04 Are there any decision points or conditional branches in the sequence of events? 05 Does the sequence diagram cover the complete lifecycle of the interaction, including initiation and termination?	Design Modeling Communication Problem-Solving	1. Prepare 2 Questions (CH 4) 2. Midterm (Mar 12th-14th /8:00 am)
10	Software Architecture	27-Oct	9	01 What are the main entities or classes in the system? 02 What attributes and methods are associated with each class? 03 What relationships exist between classes? 04 What are the main components or modules of the system? 05 Are there any dependencies or associations between components?	Understanding of Software Architecture Object-Oriented Analysis and Design (OOAD) Critical Thinking	1. Ticket 5 Code Review Form-2 (Mar 28th /11:00 am) 2. Submit Unit Test & Backlog screenshot (Mar 28th /12:00 pm)
11	Cloud-based Software	3-Nov	9	01 Differences between on-premises and cloud 02 What is cloud computing? 03 Cloud computing: Deployment Model 04 Cloud Computing: Service Model	Understanding of Software Architecture Object-Oriented Analysis and Design (OOAD) Critical Thinking	1. Prepare 2 Questions (CH 5) 2. Environment Setup (Check List) 3. Prepare your DevOps check this link in the first part (15min) https://youtu.be/f5EpcWp0THw?si=As6IVcWmGI5SwvCf
12	Microservices Architecture	10-Nov	9	01 What are Microservices? 02 How Microservices communicate with each other? 03 What are Microservices Challenges?	Understanding of Software Architecture Object-Oriented Analysis and Design (OOAD) Critical Thinking Presentation	1. Submit & Present Ticket 4 (Apr 10th/11:00 am) 2. Prepare 2 Questions (CH 6) https://www.youtube.com/watch?v=pg19Z8LL06w
13	Security and Privacy	17-Nov	9			1. Prepare 2 Questions (CH 7) https://youtube.com/watch?v=6WZ6S-qmtqY&si=fSv3vduavp2NgSFF
14	Reliable Programming	24-Nov	9	01 Is the code easy to read and understand? 02 Are variable and method names descriptive? 03 Are there comments where necessary to explain complex logic? 04 Are functions/methods appropriately sized and focused on a single responsibility? 05 Is the code efficient, how to improve it?		1. Prepare 2 Questions (CH 8)
15	Pre-finals week	8-Dec	6	How can I use Student Experience Evaluation to make a difference? What Strategies I need to implement in my Revision? Do I need to Seek Clarification?	Ethical Conduct Manage Stress Review and Reflect	1. Ticket 5 Sprint 2 Code Review Form-3 (Apr 28th-May 2nd/11:00 am)
16	Exam	15-Dec	2	What did we learn?? How awesome our group work and activity? How can we answer the final exam questions?	Understanding Exam Question Application of Knowledge Clear Communication	Final Exam
17	Have great holidays	18-Dec				
	Total Hours		134			

University Policies

Mental Health Support Services

Support is available for any student experiencing mental health issues that are impacting their academic success. Students can either been seen at the University Counseling Center (UCC) located on the second floor of Goddard Health Center or receive 24/7/365 crisis support from a licensed mental health provider through TELUS Health. To schedule an appointment or receive more information about mental health resources at OU please call the UCC at 405-325-2911 or visit University Counseling Center. The UCC is located at 620 Elm Ave., Room 201, Norman, OK 73019.

Title IX Resources and Reporting Requirement

The University of Oklahoma faculty are committed to creating a safe learning environment for all members of our community, free from gender and sex-based discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking, in accordance with Title IX. There are resources available to those impacted, including: speaking with someone confidentially about your options, medical attention, counseling, reporting, academic support, and safety plans. If you have (or someone you know has) experienced any form of sex or gender-based discrimination or violence and wish to speak with someone confidentially, please contact OU Advocates (available 24/7 at 405-615-0013) or University Counseling Center (M-F 8 a.m. to 5 p.m. at 405-325-2911).

Because the University of Oklahoma is committed to the safety of you and other students, and because of our Title IX obligations, I, as well as other faculty, Graduate Assistants, and Teaching Assistants, are mandatory reporters. This means that we are obligated to report gender-based violence that has been disclosed to us to the Institutional Equity Office. This means that we are obligated to report gender-based violence that has been disclosed to us to the Institutional Equity Office. This includes disclosures that occur in: class discussion, writing assignments, discussion boards, emails and during Student/Office Hours. You may also choose to report directly to the Institutional Equity Office. After a report is filed, the Title IX Coordinator will reach out to provide resources, support, and information and the reported information will remain private. For more information regarding the University's Title IX Grievance procedures, reporting, or support measures, please visit Institutional Equity Office at 405-325-3546.

Reasonable Accommodation Policy

The University of Oklahoma (OU) is committed to the goal of achieving equal educational opportunity and full educational participation for students with disabilities. If you have already established reasonable accommodations with the Accessibility and Disability Resource Center (ADRC), please submit your semester accommodation request through the ADRC as soon as possible and contact me privately, so that we have adequate time to arrange your approved academic accommodations.

If you have not yet established services through ADRC, but have a documented disability and require accommodations, please complete ADRC's pre-registration form to begin the

registration process. ADRC facilitates the interactive process that establishes reasonable accommodations for students at OU. For more information on ADRC registration procedures, please review their Register with the ADRC web page. You may also contact them at (405)325-3852 or adrc@ou.edu, or visit www.ou.edu/adrc for more information.

Note: disabilities may include, but are not limited to, mental health, chronic health, physical, vision, hearing, learning and attention disabilities, pregnancy-related. ADRC can also support students experiencing temporary medical conditions.

Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty. [See Faculty Handbook 3.15.2]

Adjustments for Pregnancy and Related Issues

Should you need modifications or adjustments to your course requirements because of pregnancy or a pregnancy-related condition, please request modifications via the Institutional Equity Office website or call the Institutional Equity Office at 405/325-3546 as soon as possible. Also, see the Institutional Equity Office FAQ on Pregnant and Parenting Students' Rights for answers to commonly asked questions.

Final Exam Preparation Period

Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU's Final Exam Preparation Period policy.

Emergency Protocol

During an emergency, there are official university procedures that will maximize your safety.

Severe Weather: If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather.

1. Look for severe weather refuge location maps located inside most OU buildings near the entrances.
2. Seek refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building.
3. Go to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows.
4. Get in, Get Down, Cover Up
5. Wait for official notice to resume normal activities.

Additional Weather Safety Information is available through the Department of Campus Safety.

The University of Oklahoma Active Threat Guidance

The University of Oklahoma embraces a Run, Hide, Fight strategy for active threats on campus. This strategy is well known, widely accepted, and proven to save lives. To receive emergency campus alerts, be sure to update your contact information and preferences in the account settings section at one.ou.edu.

RUN: Running away from the threat is usually the best option. If it is safe to run, run as far away from the threat as possible. Call 911 when you are in a safe location and let them know from which OU campus you're calling from and location of active threat.

HIDE: If running is not practical, the next best option is to hide. Lock and barricade all doors; turn of all lights; turn down your phone's volume; search for improvised weapons; hide behind solid objects and walls; and hide yourself completely and stay quiet. Remain in place until law enforcement arrives. Be patient and remain hidden.

FIGHT: If you are unable to run or hide, the last best option is to fight. Have one or more improvised weapons with you and be prepared to attack. Attack them when they are least expecting it and hit them where it hurts most: the face (specifically eyes, nose, and ears), the throat, the diaphragm (solar plexus), and the groin.

Please save OUPD's contact information in your phone.

NORMAN campus: *For non-emergencies call (405) 325-1717. For emergencies call (405) 325-1911 or dial 911.*

TULSA campus: *For non-emergencies call (918) 660-3900. For emergencies call (918) 660-3333 or dial 911.*

Fire Alarm/General Emergency

If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates:

1. *LEAVE* the building. Do not use the elevators.
2. *KNOW* at least two building exits
3. *ASSIST* those that may need help
4. *PROCEED* to the emergency assembly area
5. *ONCE safely outside, NOTIFY first responders of anyone that may still be inside building due to mobility issues.*
6. *WAIT* for official notice before attempting to re-enter the building.

OU Fire Safety on Campus