

COSC 4351 Fall 2023

Software Engineering

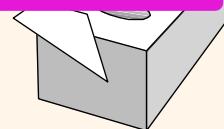
M & W 4 to 5:30 PM

Prof. **Victoria Hilford**

PLEASE TURN your webcam ON

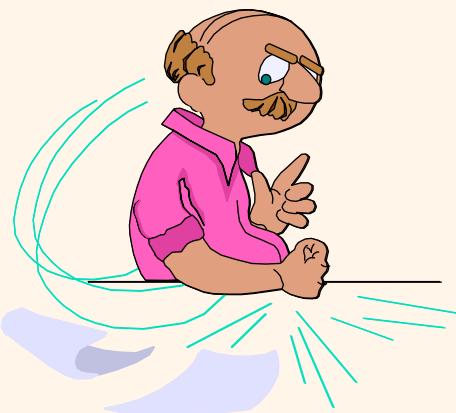
NO CHATTING during LECTURE

From 4:00 to 4:25 PM – 25 minutes.



COSC 4351

4 to 5:30



**PLEASE
LOG IN
CANVAS**

Please close all other windows.

COURSE TITLE/SECTION: COSC4351 – Software Engineering Fall 2023 (13236)

TIME: MW 4 – 5:30 PM

FACULTY: Dr. Victoria Hilford
appointment

OFFICE HOURS: MW (12–12:30 PM) & by

Synchronous ONLINE (attendance required, no recordings)

E-mail: CANVAS Email, **TEAMS**

Phone: N/A **FAX:** N/A

The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

This course is using zyBooks, TEAMS and CANVAS.

LAPTOP REQUIREMENT

All students must have a laptop for the duration of the class. In purchasing a laptop, you'll want to consider these issues:

Built-in wireless capability to access

<https://uh.edu/blackboard.com> and <http://www.zvbooks.com/>

Enter code **UHCOSC4351Hilford2Fall2023**

Click Subscribe (must use your **CANVAS Last Name, First Name**)

A subscription is **\$0**. Students may begin subscribing on Jul 31, 2023 and the cutoff to subscribe is Dec 06, 2023. Subscriptions will last until Jan 07, 2024.

Must match CANVAS Last Name, First Name

IV. List of discussion/lecture topics

This course will include the following topical (content) areas:

1. Software Development Processes
2. Software Methodologies
3. Project planning and estimation
4. Risk assessment
5. Software Testing – Testing approaches and tools in particular TDD
6. Agile Software Development Principles and Practices
7. XP, SCRUM, other Agile methods
8. Requirements, Analysis, Design, Implementation Workflows

On the syllabus

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are

important contributors to student success. Absences may be excused as provided in the University of Houston [Undergraduate Excused Absence Policy](#) and [Graduate Excused Absence Policy](#) for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to [military service](#), [religious holy days](#), [pregnancy and related conditions](#), and [disability](#).

Please remember that this is a synchronous online class. TEAMS and CANVAS can be accessed from any mobile device. You need to be available just the 1 hour and 15 minutes (from 4:00 to 5:15 PM).

Notification of all excused absences must be sent to the instructor before the excused class.

On the syllabus

Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor.

If you have or think you may have a disability such that you need to record class-related activities, please contact the Justin Dart, Jr. Student Accessibility Center. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

On the syllabus

Honor Code Statement

Students may be asked to sign an honor code statement as part of their submission of any graded work including but not limited to projects, quizzes, and exams:

"I understand and agree to abide by the provisions in the (select: [University of Houston Undergraduate Academic Honesty Policy](#), [University of Houston Graduate Academic Honesty Policy](#)). I understand that academic honesty is taken very seriously and in the cases of violations, penalties may include suspension or expulsion from the University of Houston."

On the syllabus

VI. Evaluation and Grading

Must be in TEAMS to take any graded assignment. Any attempt to take a graded assignment not being in TEAMS will result in a grade of ZERO for that graded assignment.

- 30% [zyBook](#)
- 20% [Class Participation](#)
- 50% [EXAMs \(4\)](#)

Grading Scale:

- 93 or higher A
- 90 – below 93 A-
- 87– below 90 B+
- 83 – below 87 B
- 80 – below 83 B-
- 77 – below 80 C+
- 73 – below 77 C
- 70 – below 73 C-
- 67 – below 70 D+
- 63 – below 67 D
- 60 – below 63 D-
- 0 – below 60 F

Policy on grades of I (Incomplete):

Students will be given an incomplete only under special circumstances (like medical emergency or serious schedule conflicts). Students will not be given I for failure to turn in work.

VH, Victoria Hilford.

Office Hours:

M & W 12 to 12:30 PM

TEAMS (online synchronous)

TA, Youyi Yang (A – L).

Office Hours:

T & Th 4 to 5 PM

TEAMS (online synchronous)

TA, Nguyen, Kevin (M – Z).

Office Hours:

M & W 12 to 1 PM

TEAMS (online synchronous)

TEAMS CHAT

Search

Meet

All teams

HC

COSC 4351 13236 FALL 2023 4 to...

Home page

Class Notebook

Classwork

Assignments

Grades

Reflect

Insights

General

New conversation

Hilford, Victoria 2:53 AM
Welcome to COSC 4351, M & W 4 to 5:30 PM.
TEAMS is a great way to communicate. Except I am teaching 4 classes and when I get a Chat message in TEAMS I do not know which class you are in. Please start every Chat message to me with **COSC 4351 – 4 to 5:30**.
The department has allocated 2 TAs for this class. Their office hours are posted in TEAMS Calendar.
It will be another great semester for all of us.
See you in class, Monday, August 21, 2023 3:50 PM.
TEAMS > Calendar

4 PM

5 PM

HC

Activity

Chat

Teams

Assignments

Calendar

Calls

Files

Shifts

Apps

Help

You may not use TEAMS or CANVAS Class Roll to create outside groups



Welcome to your class zyBook

Instructions for your students

- Students will access zyBooks directly.
- Students will access zyBooks through links in an LMS (Blackboard, Canvas, etc.)

Please provide the following instructions to your students. Copy into your syllabus, discussion board, etc.

1. Sign in or create an account at learn.zybooks.com
 2. Enter zyBook code
- UHCOSC4351Hilford2Fall2023**
3. Subscribe

A subscription is **\$0**. Students may begin subscribing on Jul 31, 2023 and the cutoff to subscribe is Dec 06, 2023. Subscriptions will last until Jan 07, 2024.

Must match CANVAS Last Name, First Name

CANVAS - DETAILED SYLLABUS

H 2023 Fall 1

Home

Announcements

Assignments

Discussions

Grades

People

Pages

Files

Syllabus

Outcomes

Rubrics

Quizzes

Modules

Collaborations

New Analytics

Studio

LockDown Browser

Course Reserves

Attendance

COSC 4351 Detailed Syllabus.pdf

Download COSC 4351 Detailed Syllabus.pdf (129 KB) | [Alternative formats](#)

Page 1 of 5 | [ZOOM](#)

Detailed Syllabus					
DATE	PAPERS		ZyBook		
08.21.2023 (M 4 to 5:30) (1)	SDLC: 1. Software Development Life Cycle SDLC 2015.pdf 2. A Comparative Analysis of Software development life cycle Models 2015.pdf 3. IBM application lifecycle management (ALM) 2015.pdf	CANVAS ZyBook Lecture 1: What is Software Engineering			
08.23.2023 (W 4 to 5:30) (2)		WEB TECHNOLOGIES	Start ZyBook: Sections 1-5		
08.28.2023 (M 4 to 5:30) (3)	Review Tutorials 1 on WHAT tools (UML & ERD Modeling)	Lecture 2: SDLC	SDLC Papers Summary (1 Page) CANVAS Assignment		

CANVAS Content and Structure.

▼ EXAMS 50%

▼ WEB PROGRAMMING ZYBOOK 30%

▼ CLASS PARTICIPATION 20%

▼ CLASSES

▼ TUTORIALS

Grade:

EXAMs (4) 50%

Web Programming 30%

Class Participation 20%

Please print and keep with you.

08.21.2023 (M 4 to 5:30) (1)	SDLC: 1. Software Development Life Cycle SDLC 2015.pdf 2. A Comparative Analysis of Software development life cycle Models 2015.pdf 3. IBM application lifecycle management (ALM) 2015.pdf	CANVAS, ZyBook Lecture 1: What is Software Engineering				
08.23.2023 (W 4 to 5:30) (2)	WEB TECHNOLOGIES	Start ZyBook: Sections 1-5				
08.28.2023 (M 4 to 5:30) (3)	Review Tutorials 1 ON WHAT tools (UML & ERD Modeling)	Lecture 2: SDLC	SDLC Papers Summary (1 Page) CANVAS Assignment			
08.30.2023 (W 4 to 5:30) (4)	Tutorials 1 on WHAT tools (UML & ERD Modeling)		UML Modeling CANVAS Assignment			
09.06.2023 (W 4 to 5:30) (5)		Lecture 3: Software Development Process				
09.11.2023 (M 4 to 5:30) (6)		EXAM 1 REVIEW (CANVAS) (ZyBook)	Download ZyBook: Sections 1-5			
09.13.2023 (W 4 to 5:30) (7)	Optional					
09.18.2023 (M 4 to 5:30) (8)					EXAM 1 (CANVAS) (ZyBook)	

Please print and keep with you.

09.20.2023 (W 4 to 5:30) (9)	Front End Languages: 1. How Do You Learn – Dzone Article 2016.pdf	WEB TECHNOLOGIES	Start ZyBook: Sections 6-9		
09.25.2023 (M 4 to 5:30) (10)	Web App Dev: 1. Guide to Web Application Development 2015.pdf 2. PHP ASP.net Comparison 2015.pdf 3. Ruby on Rails vs Node.js Comparison 2015.pdf	Tutorials 2 on Front End Languages C#, RUBY, PYTHON, PHP	OO Languages CANVAS Assignment		
09.27.2023 (W 4 to 5:30) (11)	Estimating and Planning: 1. Estimating Techniques 2015.pdf 2. How do you estimate on an Agile project 2015.pdf	Tutorials 3 on C# Visual Studio IDE MVC, PYTHON PyCharm IDE, Django, PHP PhpStorm IDE Zend frameworks WEBCANVAS APPS	WEB APP Papers Summary (1 Page) CANVAS Assignment		
10.02.2023 (M 4 to 5:30) (12)	Lecture 4: Estimating and Planning Tutorials 4 COCOMO and MS Project		Estimating and Planning Papers Summary (1 Page) CANVAS Assignment		
10.04.2023 (W 4 to 5:30) (13)		EXAM 2 REVIEW (CANVAS) (ZyBook)	Download ZyBook: Sections F-9		
10.09.2023 (M 4 to 5:30) (14)	Optional			Q & A Set 2 topics:	
10.13.2023 (W 4 to 5:30) (15)					EXAM 2 (CANVAS) (ZyBook)

Please print and keep with you.

10.16.2023 (M 4 to 5:30) (16)	Requirements: 1. Why Software Projects Fail 2015.pdf 2. The Why What who When and How of Software Requirements 2015.pdf	WEB TECHNOLOGIES	Start ZyBook: Sections 10-11		
10.18.2023 (W 4 to 5:30) (17)	Analysis: 1. Semi-Formal and Formal Specification Techniques for Software Systems.pdf	Lecture 5: Requirements	Requirements Papers Summary (1 Page) CANVAS Assignment		

10.23.2023 (M 4 to 5:30) (18)		Lecture 6: WHAT - Analysis	Analysis Papers Summary (1 Page) CANVAS Assignment		
10.25.2023 (W 4 to 5:30) (19)		Lecture 7: HOW - Design Tutorial 5 ERD to Relations			

10.30.2023 (M 4 to 5:30) (20)		EXAM 3 REVIEW (CANVAS)	Discussion ZyBook: Sections 10-11		
11.01.2023 (W 4 to 5:30) (21)				Q & A Set 3 topics.	

11.06.2023 (M 4 to 5:30) (22)		EXAM 3 (CANVAS)			
---	--	--------------------	--	--	--

Please print and keep with you.

11.08.2023 (W 4 to 5:30) (23)	WEB TECHNOLOGIES	Start ZyBook: Sections 12-14		
11.13.2023 (M 4 to 5:30) (24)	Lecture 8: Implementation	Link to Relational CANVAS Assignment		
11.15.2023 (W 4 to 5:30) (25)	Lecture 9: Testing Tutorial 6 TDD			
11.20.2023 (M 4 to 5:30) (26)	EXAM 4 REVIEW (CANVAS)	Download ZyBook: Sections 12-14		
11.27.2023 (M 4 to 5:30) Optional (27)				Q & A Set 4 topics.
(M 4 to 5:30) (28) LAST CLASS				(CANVAS)

Last day of class 11/29/2023

ZyBook



H 2023 Fall 1

Home
Announcements 0
Assignments

Discussions

Grades

People

Pages

Files

Syllabus

Outcomes 0

Rubrics

Quizzes

Modules

Collaborations

New Analytics

Studio

LockDown Browser

Course Reserves

All

COSC 4351 Detailed Syllabus.pdf

Download COSC 4351 Detailed Syllabus.pdf (129 KB) | Alternative formats

Page < 1 > of 5 | ZOOM +

Detailed Syllabus

DATE	PAPERS	ZyBook		
08.21.2023 (M 4 to 5:30) (1)	SDLC: 1. Software Development Life Cycle SDLC 2015.pdf 2. A Comparative Analysis of Software development life cycle Models 2015.pdf 3. IBM application lifecycle management (ALM) 2015.pdf	CANVAS Lecture 1: What is Software Engineering		
08.23.2023 (W 4 to 5:30) (2)		 Start ZyBook: Sections 1-5		
08.28.2023 (M 4 to 5:30) (3)	Review Tutorials 1 on WHAT tools (UML & ERD Modeling)	Lecture 2: SDLC	 	

ZyBook – Web Programming



Must match CANVAS Last Name, First Name

ZyBook – Web Programming

Summary

This zyBook provides a new, highly-interactive introduction to Web Programming using the HTML5 standard, which uses **HTML**, **CSS**, and **JavaScript** to create webpages and web applications. This zyBook emphasizes how HTML, CSS, and JavaScript separate document structure, document presentation, and web page interaction with the user, respectively, and provides highly-interactive learning of each of these languages. This material covers full stack development of web application, including client-side technologies that run in the web browser (HTML, CSS, JavaScript) and server-side technologies that run on the web server (Node.js, PHP, databases).

Description

Provides an exceptionally-interactive introduction to Web Programming, with numerous embedded learning questions and animations. Instructors can quickly see which activities have been completed by students. This zyBook is intended to replace a traditional textbook.

The learning benefits of zyBooks vs. traditional textbooks has been shown through various studies in numerous other computing, engineering, and math topics. See zybooks.com for more info.

ZyBook – Web Programming

Table of contents		View full index
About this material		
Table of contents 		
About this material		
1.	Introduction to Web Programming	Hidden ▾
2.	HTML	Hidden ▾
3.	More HTML	Hidden ▾
4.	Basic CSS	Hidden ▾
5.	Advanced CSS	Hidden ▾
6.	Basic JavaScript	Hidden ▾
7.	JavaScript in the Browser	Hidden ▾
8.	Advanced JavaScript	New Content ▾
9.	jQuery	Hidden ▾
10.	Mobile Web Development	Hidden ▾
11.	Node.js	Hidden ▾
12.	PHP	Hidden ▾
13.	Advanced PHP	Hidden ▾
14.	Relational Databases and SQL	Hidden ▾

Work on Participation Activities

PARTICIPATION ACTIVITY | 1.3.1: HTTP requests and responses.

Start 2x speed

DNS

Domain Name Search

The diagram illustrates the Domain Name Search process. On the left, a 'Web Browser' (blue box) displays the URL `http://w3c.org/test.html`. Inside the browser, the HTML code shows an image tag with `src="field.jpg"`. A red box highlights this image tag. On the right, a 'Web Server' (orange box) contains files `test.html` and `field.jpg`. An orange arrow labeled 'TCP connection' points from the browser to the web server. Below it, an orange arrow labeled 'HTTP request test.html' points from the browser to the web server. The web server returns an orange arrow labeled 'HTTP response <html>' back to the browser. The browser then sends another orange arrow labeled 'HTTP request field.jpg' to the web server. The web server returns an orange arrow labeled 'HTTP response [image]' back to the browser. Finally, a red arrow labeled 'TCP connection closed' points from the browser back to the web server.

Feedback?

1) Before a TCP connection is created, the web browser performs a/an _____.

- HTTP request
- HTTP response
- DNS lookup

Correct

The browser performs a DNS lookup so the browser can establish a TCP connection with the web server.

Work on Challenge Activities

CHALLENGE ACTIVITY

2.2.1: Basic HTML tags.

449702.26550.qx3zqy7

Start

Modify each sentence in the poem to end with a
 tag, except the last sentence. SHOW EXPECTED

```
1
2 <p>Work hard. Think big. Live passionately. So it goes.</p>
3
```

1 2 3 4

The screenshot shows a challenge activity titled "2.2.1: Basic HTML tags." with the identifier "449702.26550.qx3zqy7". A large orange "Start" button is visible. The task instructions ask to modify sentences in a poem to end with a
 tag, except the last sentence, and to "SHOW EXPECTED". Step 1 shows the first two lines of the poem: "

Work hard. Think big. Live passionately. So it goes.

". Step 2 is empty. Step 3 is empty. Step 4 is empty. Below the steps is a preview area containing the expected output: "

Work hard.
Think big.
Live passionately.
So it goes.

". A navigation bar at the bottom includes buttons for steps 1 through 4.

ZyBook – Web Programming

Complete Sections 1 - 5

1. Introduction to Web Programming



2. HTML



3. More HTML



4. Basic CSS



5. Advanced CSS



09.11.2023
(M 2:30 to 4)

(6)

EXAM 1 REVIEW
(CANVAS)
(ZyBook)

Download

ZyBook:

Sections 1-5

Due September 11, 4:00 PM

Grade:

Web Programming 30%



H 2023 Fall 1



Account



Dashboard



Courses



Calendar



Inbox



History



Commons



Studio



Help

Home

Announcements

Assignments

Discussions

Grades

People

Pages

Files

Syllabus

Outcomes

COSC 4351 Detailed Syllabus.pdf

Download COSC 4351 Detailed Syllabus.pdf (129 KB) | [Alternative formats](#)

Page < 1 > of 5 ZOOM

Detailed Syllabus

DATE	PAPERS	ZyBook		
08.21.2023 (M 4 to 5:30) (1)	SDLC: 1. Software Development Life Cycle SDLC 2015.pdf 2. A Comparative Analysis of Software development life cycle Models 2015.pdf 3. IBM application lifecycle management (ALM) 2015.pdf	CANVAS, ZyBook Lecture 1: What is Software Engineering		
08.23.2023 (W 4 to 5:30) (2)		 WEB TECHNOLOGIES Start ZyBook: Sections 1-5		
08.28.2023 (M 4 to 5:30) (3)	Review Tutorials 1 on WHAT tools (UML & ERD Modeling)	 Lecture 2: SDLC 	SDLC Papers Summary (1 Page) CANVAS Assignment	

From 4:25 to 4:55 PM – 30 minutes.

08.21.2023 (M 4 to 5:30)	<p>SDLC:</p> <ul style="list-style-type: none">1. Software Development Life Cycle SDLC 2015.pdf2. A Comparative Analysis of Software development life cycle Models 2015.pdf3. IBM application lifecycle management (ALM) 2015.pdf	CANVAS, ZyBook	Lecture 1: What is Software Engineering
-----------------------------	--	----------------	---

COSC 4351 Company Fundamental Software Engineering

What is Software Engineering

- **1968** NATO Conference, Garmisch, Germany
 - » Coined the term **software engineering**
- Aim: To solve the **software crisis**
- **Software** was delivered
 - Late
 - Over budget
 - With residual faults

21 years ago

Cutter Consortium Data

- **2002** survey of information technology organizations
 - 78% have been involved in disputes ending in litigation
- For the organizations that entered into litigation:
 - In **67% of the disputes**, the functionality of the information system as delivered did not meet up to the claims of the developers
 - In **56% of the disputes**, the promised delivery date slipped several times
 - In **45% of the disputes**, the defects were so severe that the information system was unusable

55 years ago 1.1 Historical aspects

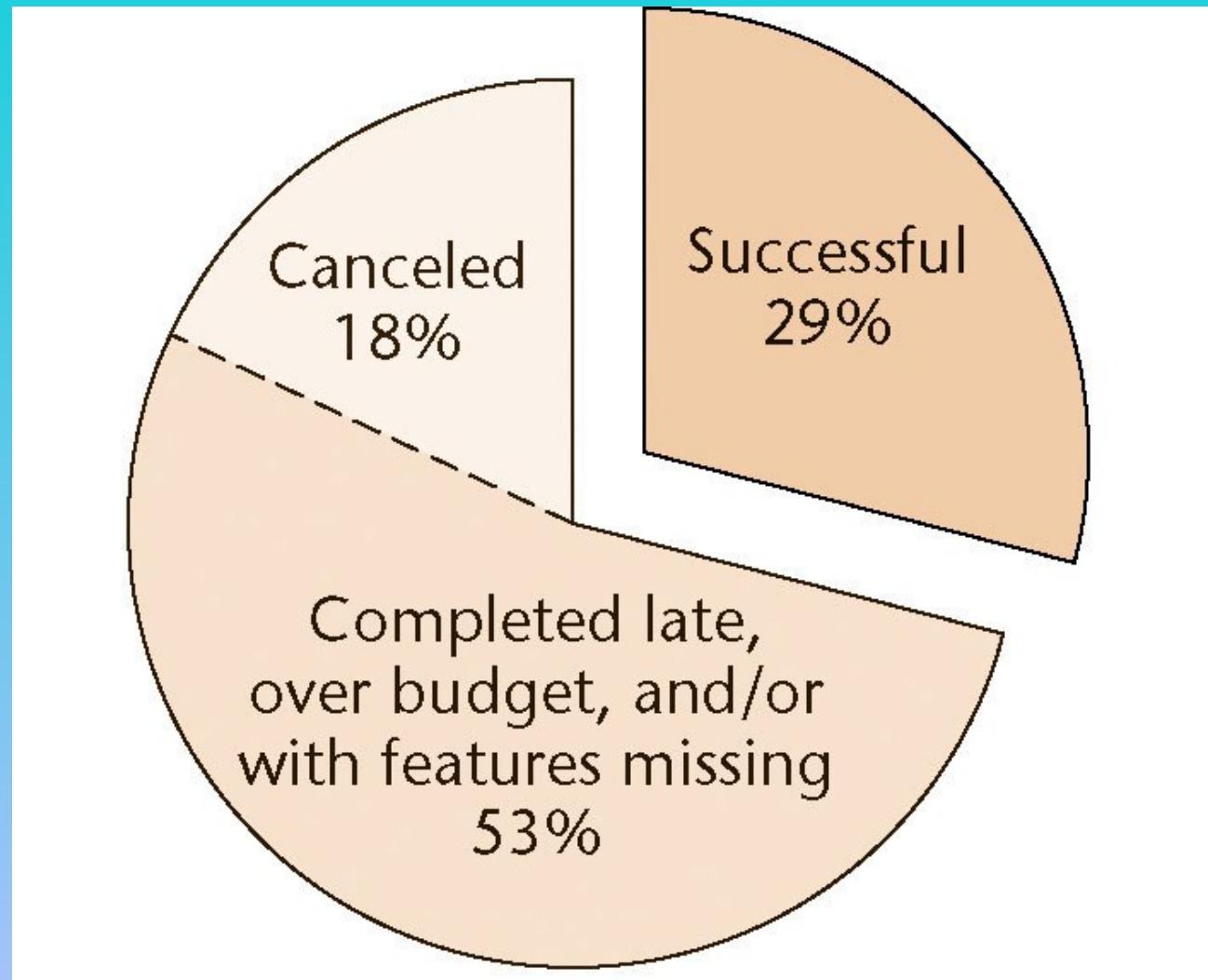
- **1968** NATO Conference, Garmisch, Germany
 - » Coined the term **SOFTWARE engineering**
- Aim: To solve the **SOFTWARE crisis**
- **SOFTWARE** was delivered
 - Late
 - Over budget
 - With residual faults

78% failed

19 years ago

Standish Group Data

Data on
9236
projects
completed in
2004



71% failed

How Successful Have We Been?

Examples of **Software Products Failure**

IRS hired Sperry Corporation to build an **automated federal income tax form processing**

- An extra **\$90 M** was needed to enhance the original **\$103 M product**
- IRS lost **\$40.2 M** on interests and **\$22.3 M** in overtime wages because **refunds were not returned on time**

Malfunctioning **software** in Therac-25 killed several people

Reliability constraints have caused cancellation of many
Safety-Critical systems

- **Safety-Critical:** something whose failure poses a **threat to life or health**

How Successful Have We Been?

Examples of **Software Products Failure**

WWMCCS – WorldWide Military Command and Control System

1979

A decidedly less humorous software fault was detected on November 9, 1979. The Strategic Air Command had an alert scramble when the worldwide military command and control system (WWMCCS) computer network reported that the Soviet Union had launched missiles aimed toward the United States [Neumann, 1980]. What actually happened was that a simulated attack was interpreted as the real thing, just as in the movie *WarGames* some 5 years later. Although the U.S. Department of Defense understandably has not given details about the precise mechanism by which test data were taken for actual data, it seems reasonable to ascribe the problem to a software fault. Either the system as a whole was not designed to differentiate between simulations and reality or the user interface did not include the necessary checks for ensuring that end users of the system would be able to distinguish fact from fiction. In other words, a software fault, if indeed the problem was caused by software, could have brought civilization as we know it to an unpleasant and abrupt end. (See Just in Case You Wanted to Know Box 1.1 for information on disasters caused by other software faults.)

How Successful Have We Been?

Examples of Software Failure

Gulf War Patriot Antimissiles **1991**

work, disaster was averted at the last minute. However, the consequences of other software faults have been fatal. For example, between 1985 and 1987, at least two patients died as a consequence of severe overdoses of radiation delivered by the Therac-25 medical linear accelerator [Leveson and Turner, 1993]. The cause was a fault in the control software.

Also, during the 1991 Gulf War, a Scud missile penetrated the Patriot antimissile shield and struck a barracks near Dhahran, Saudi Arabia. In all, 28 Americans were killed and 98 wounded. The software for the Patriot missile contained a cumulative timing fault. The Patriot was designed to operate for only a few hours at a time, after which the clock was reset. As a result, the fault never had a significant effect and therefore was not detected. In the Gulf War, however, the Patriot missile battery at Dhahran ran continuously for over 100 hours. This caused the accumulated time discrepancy to become large enough to render the system inaccurate.

During the Gulf War, the United States shipped Patriot missiles to Israel for protection against the Scuds. Israeli forces detected the timing problem after only 8 hours and immediately reported it to the manufacturer in the United States. The manufacturer corrected the fault as quickly as it could, but tragically, the new software arrived the day after the direct hit by the Scud [Mellor, 1994].

Fortunately, it is extremely rare for death or serious injury to be caused by a software fault. However, one fault can cause major problems for thousands and thousands of people. For example, in February 2003, a software fault resulted in the U.S. Treasury Department mailing 30,000 Social Security checks that had been printed without the name of the beneficiary, so the checks could not be deposited or cashed [St. Petersburg Times Online, 2003]. In April 2003, borrowers were informed by SLM Corp. (commonly known as Sallie Mae) that the interest on their student loans had been miscalculated as a consequence of a software fault from 1992 but detected only at the end of 2002. Nearly 1 million borrowers were told that they would have to pay more, either in the form of higher monthly payments or extra interest payments on loans extending beyond their original 10-year terms [GJSentinel.com, 2003]. Both faults were quickly corrected, but together they resulted in nontrivial financial consequences for about a million people.

How Successful Have We Been?

Examples of **Software** Failure

Ariane 5 Rocket **1996**

Ariane 5 rocket blew up 37 seconds after lift-off

- Cost: \$500 million



<https://www.bing.com/videos/search?q=ariane+5+video&view=detail&mid=E92C58DF2A82C0E9BCD1E92C58>

Reason: An attempt was made to convert a 64-bit integer into a 16-bit unsigned integer

- The Ada `exception` handler was omitted

assignment operator =

The on-board computers crashed, and so did the rocket

How Successful Have We Been?

Examples of **Software** Failure

FAA

2023

FAA computer outage brings U.S. flights to a standstill as departing planes grounded

Nation Updated on Jan 11, 2023 7:15 PM EST — Published on Jan 11, 2023 8:50 AM EST

NEW YORK (AP) — Thousands of flights across the U.S. were canceled or delayed Wednesday after a government system that offers safety and other information to pilots broke down, **stranding some planes on the ground** for hours.

The redundancy is what makes the system safe. Flight-critical systems, navigation systems, that beam which gets you down to that dark and stormy night onto that runway in 0-0, you want that to be backed up many different ways, of course.

This system, which is part of the overall picture of redundancy, evidently didn't have enough backups. Now, as I say, that didn't cause a direct flight safety problem. It caused huge inconvenience. But you have to ask yourself, are there other problems lurking in this system where there needs to be more resilience, there needs to be another layer of redundancy?

And I think it's high time that Congress, that the people in Washington focused on the FAA and thinking about it as a crucial piece of infrastructure and appropriating the right amount of money to fix it.

	2004	2006	2008	2010	2012
Successful	29%	35%	32%	37%	39%
Failed	18%	19%	24%	21%	18%
Challenged	53%	46%	44%	42%	43%

71% failed

65% failed

68% failed

63% failed

61% failed

RESOLUTION

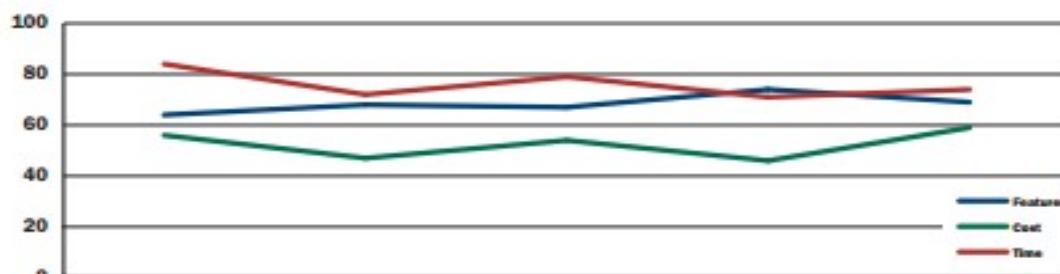
Project resolution results from CHAOS research for years 2004 to 2012.

THE CHAOS MANIFESTO

1

OVERRUNS AND FEATURES

Time and cost overruns, plus percentage of features delivered from CHAOS research for the years 2004 to 2012.

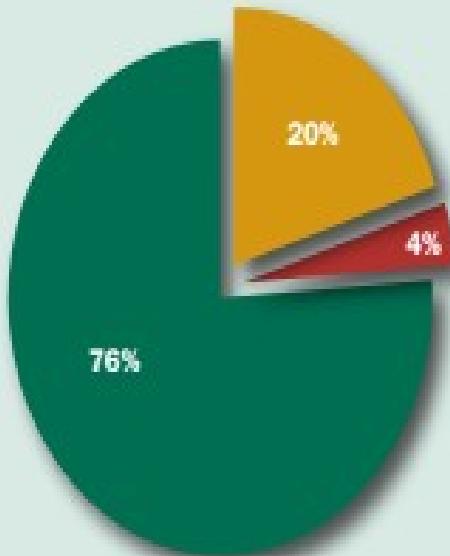


	2004	2006	2008	2010	2012
TIME	84%	72%	79%	71%	74%
COST	56%	47%	54%	46%	59%
FEATURES	64%	68%	67%	74%	69%

CHAOS RESOLUTION BY LARGE AND SMALL PROJECTS

Project resolution for the calendar year **2012** in the new CHAOS database. Small projects are defined as projects with less than \$1 million in labor content and large projects are considered projects with more than \$10 million in labor content.

Small Projects



Large Projects



Successful

Failed

Challenged

HealthCare.gov October 21, 2013

<http://www.newyorker.com/online/blogs/elements/2013/10/why-the-healthcaregov-train-wreck-happened-in-slow-motion.html>

OCTOBER 21, 2013

HEALTHCARE.GOV: IT COULD BE WORSE

POSTED BY RUSTY FOSTER

[f Share](#)

[Tweet](#)

177

[+1](#)

[PRINT](#)

[MORE](#)

COMMENTS

On October 1st, the first day of the government shutdown, the U.S. Centers for Medicare & Medicaid Services launched Healthcare.gov, a four-hundred-million-dollar online marketplace designed to help Americans research and purchase health insurance. In its first days, only a small fraction of users could create an account or log in. The problems were initially attributed to high demand. But as days turned into weeks, Healthcare.gov's troubles only seemed to multiply. Reports appeared of applications freezing half-completed and of the system "putting users in inescapable loops, and miscalculating healthcare subsidies." Politico reported that "Web brokers ... have been unable to connect to the federal system." Healthcare.gov is the public face of the Obama Administration's signature policy



MODERN RESOLUTION FOR ALL PROJECTS

	2011	2012	2013	2014	2015
SUCCESSFUL	29%	27%	31%	28%	29%
CHALLENGED	49%	56%	50%	55%	52%
FAILED	22%	17%	19%	17%	19%

69% failed 72% failed 71% failed

The Modern Resolution (OnTime, OnBudget, with a satisfactory result) of all database. Please note that for the rest of this report CHAOS Resolution will refer to the Modern Resolution definition not the Traditional Resolution definition.

CHAOS RESOLUTION BY PROJECT SIZE

	SUCCESSFUL	CHALLENGED	FAILED
Grand	2%	7%	17%
Large	6%	17%	24%
Medium	9%	26%	31%
Moderate	21%	32%	17%
Small	62%	16%	11%
TOTAL	100%	100%	100%

The resolution of all software projects by size from FY2011–2015 within the new CHAOS database.

The Cutter Consortium Group **2022?**

← → 🔍 cutter.com/experts/technology

CUTTER
AN ARTHUR D. LITTLE
COMMUNITY

PRACTICE AREAS ▾ PRODUCTS & SERVICES ▾ EXPERTS ▾ ABOUT ▾ SEARCH Login Sign Up



“ An often-forgotten aspect of data, data analytics, artificial intelligence, and all the other technology buzzwords is that in the end, everything is about humans and human emotions.

Frank Contrepois
Senior Consultant, Cutter Consortium

KUDOS

“ ...The task for building such an information system under strict time and budgetary constraints is daunting, but has been ameliorated by exploiting our “access to Cutter experts” during all phases of project planning and implementation. One critical element for success is having access to the Cutter body of knowledge and its expertise.

Arturo Cervantes
Director General of Information Services for Evaluation Results, National Institute for Educational Evaluation, Mexico

Learn from these Technology Experts



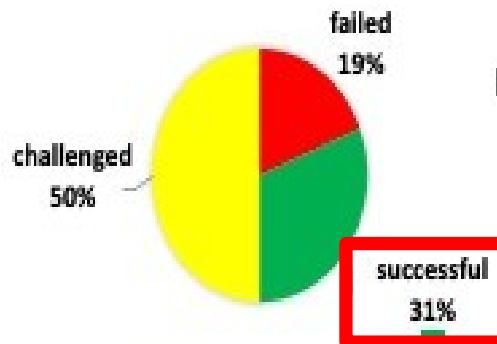
Scott Ambler Edgar Barroso Carl Bate Claude Baudoin

Slide I.40

Chaos Report **2021**

Project Success Quick Reference Card

Based on CHADS 2020: Beyond Infinity Overview, January 2021, QRC by Harry Portman



Modern measurement (software projects)



Good Sponsor, Good Team, and Good Place are the only things we need to improve and build on to improve project performance.



The **Good Place** is where the sponsor and team work to create the product. It's made up of the people who support both sponsor and team. These people can be helpful or destructive. It's imperative that the organization work to improve their skills if a project is to succeed. This area is the hardest to mitigate, since each project is touched by so many people. Principles for a Good Place are:

- The Decision Latency Principle
- The Emotional Maturity Principle
- The Communication Principle
- The User Involvement Principle
- The Five Deadly Sins Principle
- The Negotiation Principle
- The Competency Principle
- The Optimization Principle
- The Rapid Execution Principle
- The Enterprise Architecture Principle



The **Good Team** is the project's workhorse. They do the heavy lifting. The sponsor breathes life into the project, but the team takes that breath and uses it to create a viable product that the organization can use and from which it derives value. Since we recommend small teams, this is the second easiest area to improve. Principles for a Good Team are:

- The Influential Principle
- The Mindfulness Principle
- The Five Deadly Sins Principle
- The Problem-Solver Principle
- The Communication Principle
- The Acceptance Principle
- The Respectfulness Principle
- The Confrontationist Principle
- The Civility Principle
- The Driven Principle



The **Good Sponsor** is the soul of the project. The sponsor breathes life into a project, and without the sponsor there is no project. Improving the skills of the project sponsor is the number-one factor of success – and also the easiest to improve upon, since each project has only one. Principles for a Good Sponsor are:

- The Decision Latency principle
- The Vision Principle
- The Work Smart Principle
- The Daydream Principle
- The Influence Principle
- The Passionate Principle
- The People Principle
- The Tension Principle
- The Torque Principle
- The Progress Principle



Successful project Resolution by Good Place Maturity Level:

highly mature	50%
mature	34%
moderately mature	23%
not mature	23%

Successful project Resolution by Good Team Maturity Level:

highly mature	66%
mature	46%
moderately mature	21%
not mature	1%

Successful project Resolution by Good Sponsor Maturity Level:

highly mature	67%
mature	33%
moderately mature	21%
not mature	18%

The Standish Group 2022 ? \$\$\$\$\$

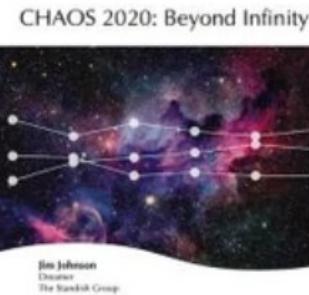


Our History

The Standish Group was formed in 1985 with a vision of innovating group refection using case-based reasoning techniques. We do this in order to profile your projects and environments against thousands of cases to deliver more precise advice based on collective wisdom. For over 30 years The Standish Group has been researching and providing advice on how to increase the value of software investments.

We do this through our 3 unique items:

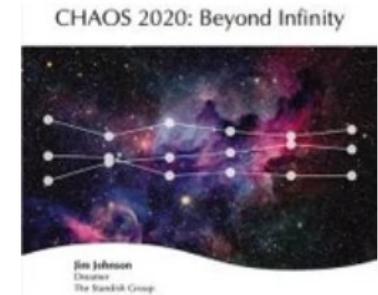
- Research database of 50,000 projects
- Patented optimization formula
- Our insight into a broad set of projects



**10-Mate Standish Membership
\$3,000.00**



**5-Mate Standish Membership
\$2,000.00**



**Single Standish Membership
\$600.00**

Conclusion

- The **software crisis** has not been solved
- Perhaps it should be called the **software depression**
 - Long duration
 - Poor prognosis

What is **Software** Engineering?

Solving Problems

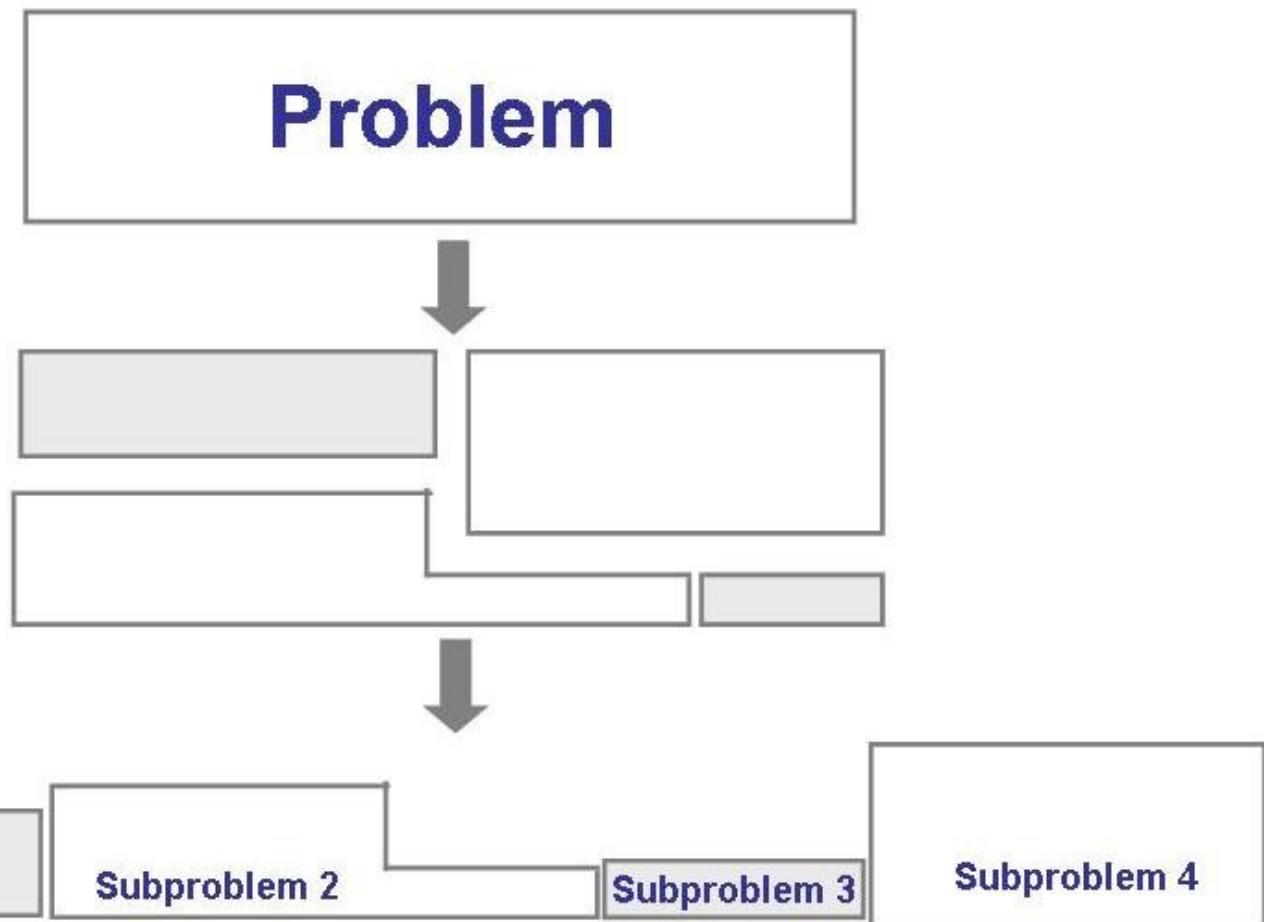
- **Software products** are **large** and **complex**
- Development requires **Analysis** and **Synthesis** (Design)
 - *Analysis*: decompose a large problem into smaller, understandable pieces
 - abstraction is the key (**models**)
 - *Synthesis*: build (compose) **software** from smaller building blocks
 - composition is challenging

What is **Software** Engineering?

Solving Problems

- The **Analysis Process**

Analysis: decompose a large problem into smaller, understandable pieces
– abstraction is the key (**models**)



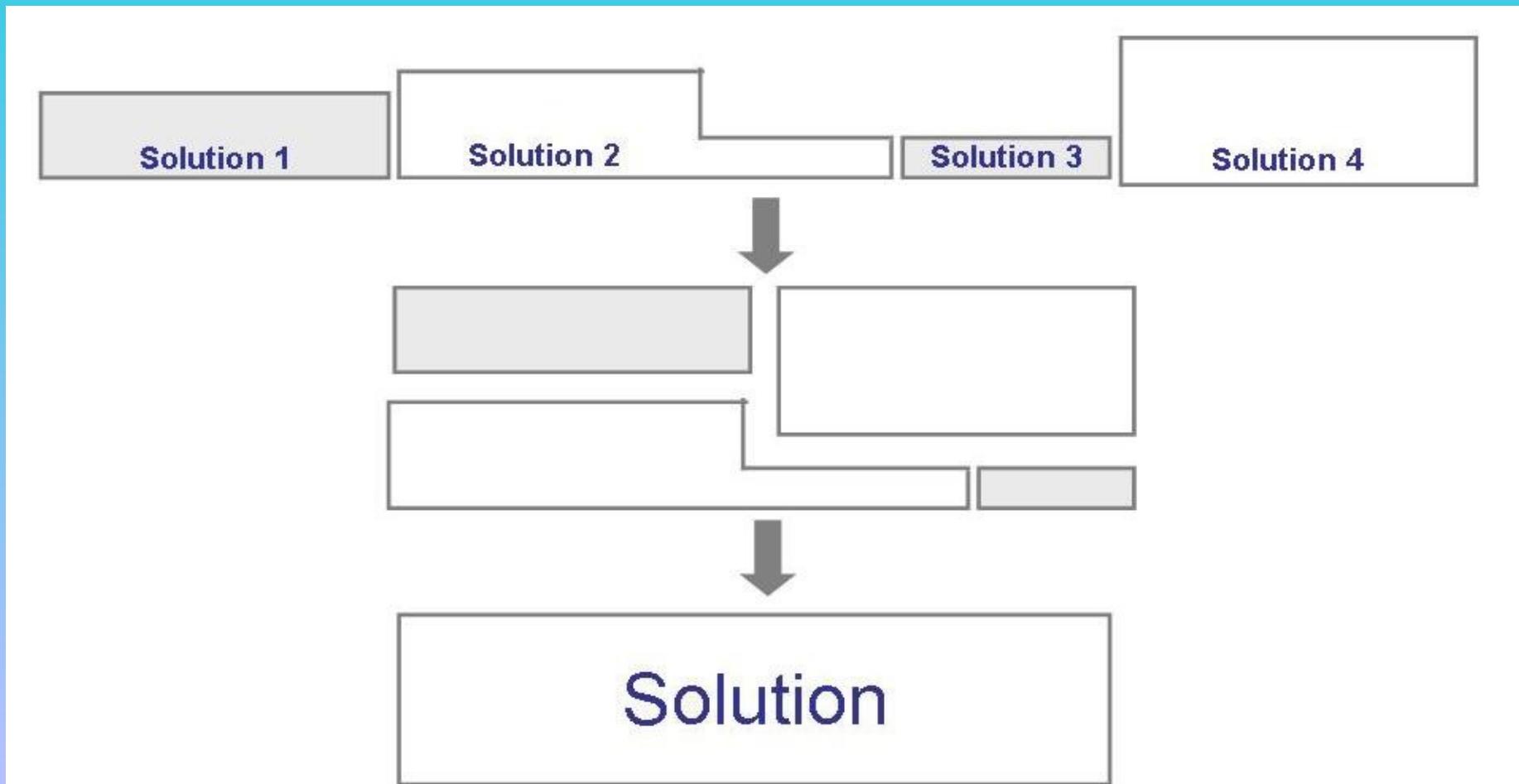
What is **Software** Engineering?

Solving Problems

- The **Synthesis (Design) Process**

Synthesis: build (compose) **SOFTWARE** from smaller building blocks

- composition is challenging



What is **Software** Engineering?

Where Does the **Software Engineer** Fit In?

Computer science

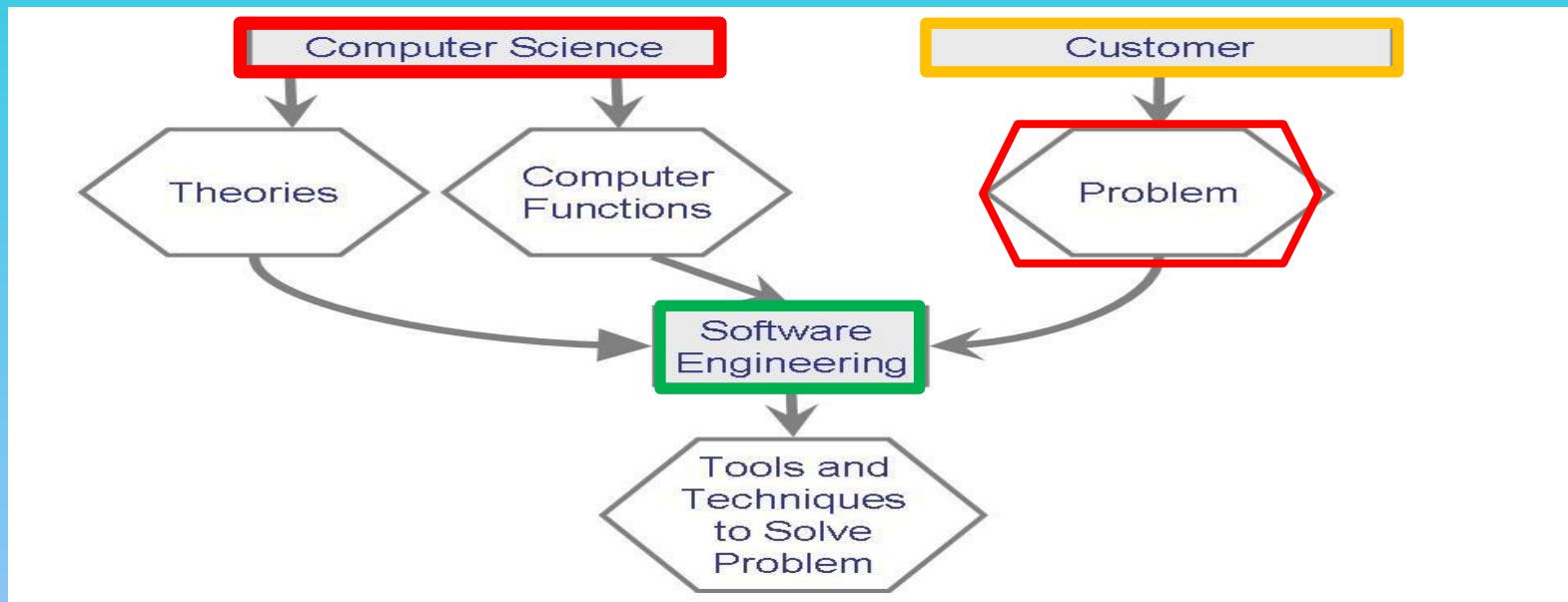
focusing on computer hardware, programming

languages, data structures and algorithms.

Software Engineering

focusing on computer as a **problem-solving**

tool



- Some aspects categorized as:
 - » Mathematics or Computer Science
- Other aspects fall into areas of:
 - » Economics, Management, or Psychology

**If time allows some of your
industry software
development experience**

At 4:55 PM.

End Class 1 Lecture 1 – Intro to Software Engineering



H 2023 Fall 1



Account



Dashboard



Courses



Calendar



Inbox



History



Commons



Studio



Help

COSC 4351 Detailed Syllabus.pdf

Download COSC 4351 Detailed Syllabus.pdf (129 KB) | Alternative formats

Page < 1 > of 5 ZOOM

Detailed Syllabus

DATE	PAPERS	ZyBook		
08.21.2023 (M 4 to 5:30)	<p>DLC:</p> <ul style="list-style-type: none">1. Software Development Life Cycle SDLC 2015.pdf2. A Comparative Analysis of Software development Life cycle Models 2015.pdf3. IBM application lifecycle management (ALM) 2015.pdf	CANVAS, ZyBook	Lecture 1: What is Software Engineering	
08.23.2023 (W 4 to 5:30)		WEB TECHNOLOGIES	Start ZyBook: Sections 1-5	
08.28.2023 (M 4 to 5:30)	<p>Review Tutorials 1 on WHAT tools (UML & ERD Modeling)</p>		Lecture 2: SDLC	 SDLC Papers Summary (1 Page) CANVAS Assignment

CANVAS

CLASSES

Class 1 Lecture 1 - Intro to Software Engineering.pptx

PAPERS on SDLC

Software Development Life Cycle SDLC 2015.pdf

A Comparative Analysis of Software development life cycle Models 2015.pdf

IBM application lifecycle management (ALM).pdf

08.28.2023
(M 4 to 5:30)

Review Tutorials 1 on
WHAT tools (UML &
ERD Modeling)

(3)

Lecture 2: SDLC

SDLC Papers
Summary
(1 Page)
CANVAS
Assignment

CLASS PARTICIPATION 20 points

20% of Total + :

One Page Summary of SDLC MODELS Papers

CLASS PARTICIPATION 20% Module | Not available until Aug 21 at 5:30pm | Due Aug 28 at 4pm | 100 pts

Due August 28, 4:00 PM

Grade:

Class Participation 20%

VH, next Web Technologies

08.23.2023 (W 4 to 5:30)		 The logo consists of the word "WEB" in white on an orange square, and "TECHNOLOGIES" in white on a grey rectangle.	Start ZyBook: Sections 1-5		
-----------------------------	--	--	-------------------------------	--	--

- 1. Introduction to Web Programming
- 2. HTML
- 3. More HTML
- 4. Basic CSS
- 5. Advanced CSS

From 5:00 to 5:15 PM – 15 minutes.

08.21.2023 (M 4 to 5:30) (1)	SDLC: 1. Software Development Life Cycle SDLC 2015.pdf 2. A Comparative Analysis of Software development life cycle Models 2015.pdf 3. IBM application lifecycle management (ALM) 2015.pdf	CANVAS, ZyBook Lecture 1: What is Software Engineering			
--	--	--	--	--	--

CLASS PARTICIPATION 20 points

20% of Total + :

I AM IN TEAMS

END Class 1 Participation COSC4351

CLASS PARTICIPATION 20% Module | Not available until Aug 21 at 5:00pm | Due Aug 21 at 5:15pm | 100 pts

08.23.2023
(W 4 to 5:30)

(2)

WEB
TECHNOLOGIES

Start ZyBook:

Sections 1-5

I understand that:

This is an **synchronous online** class.

Attendance is required.

Recording or distribution of class materials is prohibited.

1. At the beginning of selected classes there is an **assessment in the first 10 minutes**. (beige BOX in the Detailed Syllabus)

2. At the end of selected classes there is an **assessment in the last 10 minutes**. (blue BOX in the Detailed Syllabus)

3. ZyBook sections will be downloaded and used for 30% of Total Score on the dates specified in the Detailed Syllabus. (yellow Background in the Detailed Syllabus)

4. EXAMS are in BlackBoard and Zybook. I have to be **present in TEAMS in order to take the EXAMS. No late EXAMS.**

I understand.

I do not understand, BUT I will ask the TA or Instructor.

END Class 1 Participation COSC4351

QUESTIONS?

Last 10 minutes of the class.

You can leave meeting when you are done.

PPT will be posted in CANVAS under CLASSES.

At 5:15 PM.

End Class 1

VH, upload Class 1 to CANVAS.

**VH, Download Attendance Report
Rename it:
8.21.2023 Attendance Report FINAL**

Open ZyBook Sections 1-5