

41951- ANÁLISE DE SISTEMAS

# AS: course presentation

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v2023/02/14

# Key resources

Web page at [Moodle](#)

All learning materials  
Assignments submission

[Syllabus](#) (*dossier pedagógico*)

Subjects covered  
Grading (and other) rules

Course Calendar

[Weekly plan](#)



# Mapping AS in the ACM/IEEE curriculum guidelines



## Software Engineering 2014

### Curriculum Guidelines for Undergraduate Degree Programs in Software Engineering

KA/KU	Title	Hours	KA/KU	Title	Hours
<b>CMP</b>	<b>Computing essentials</b>	<b>152</b>	<b>DES</b>	<b>Software design</b>	<b>48</b>
CMP.cf	Computer science foundations	120	DES.con	Design concepts	3
CMP.ct	Construction technologies	20	DES.str	Design strategies	6
CMP.tl	Construction tools	12	DES.ar	Architectural design	12
			DES.hci	Human-computer interaction design	10
			DES.dd	Detailed design	14
			DES.ev	Design evaluation	3
<b>FND</b>	<b>Mathematical and engineering fundamentals</b>	<b>80</b>	<b>VAV</b>	<b>Software verification and validation</b>	<b>37</b>
FND.mf	Mathematical foundations	50	VAV.fnd	V&V terminology and foundations	5
FND.ef	Engineering foundations for software	22	VAV.rev	Reviews and static analysis	9
FND.ec	Engineering economics for software	8	VAV.tst	Testing	18
			VAV.par	Problem analysis and reporting	5
<b>PRF</b>	<b>Professional practice</b>	<b>29</b>	<b>PRO</b>	<b>Software process</b>	<b>33</b>
PRF.psy	Group dynamics and psychology	8	PRO.con	Process concepts	3
PRF.com	Communications skills (specific to SE)	15	PRO.imp	Process implementation	8
PRF.pr	Professionalism	6	PRO.pp	Project planning and tracking	8
			PRO.cm	Software configuration management	6
			PRO.evo	Evolution processes and activities	8
<b>MAA</b>	<b>Software modeling and analysis</b>	<b>28</b>	<b>QUA</b>	<b>Software quality</b>	<b>10</b>
MAA.md	Modeling foundations	8	QUA.cc	Software quality concepts and culture	2
MAA.tm	Types of models	12	QUA.pca	Process assurance	4
MAA.af	Analysis fundamentals	8	QUA.pda	Product assurance	4
<b>REQ</b>	<b>Requirements analysis and specification</b>	<b>30</b>	<b>SEC</b>	<b>Security</b>	<b>20</b>
REQ.rfd	Requirements fundamentals	6	SEC.sfd	Security fundamentals	4
REQ.er	Eliciting requirements	10	SEC.net	Computer and network security	8
REQ.rsd	Requirements specification and documentation	10	SEC.dev	Developing secure software	8
REQ.rv	Requirements validation	4			

# Course subject: analysis and specification of software systems

## Systems analysis

Disciplines related to the characterization of the problem and specification of the technical solution

## Development Process

Systematic engineering method. Defines activities, roles and outcomes

## Visual modeling

Unified Modeling Language - UML

## CASE tools (computer-aided software engineering)

E.g.: VisualParadigm

# Periodic Table of Software Engineering

The following table is my personal collection of most important and fundamental elements of software engineering. It may serve as a guideline what a software engineer or programmer should learn, know and most of them practice. Some are small topics and/or methods, others are huge knowledge areas.

Requirements

Design

Lean IT

Maintenance

Infrastructure

Basics

Implementation

Code Analysis

Testing

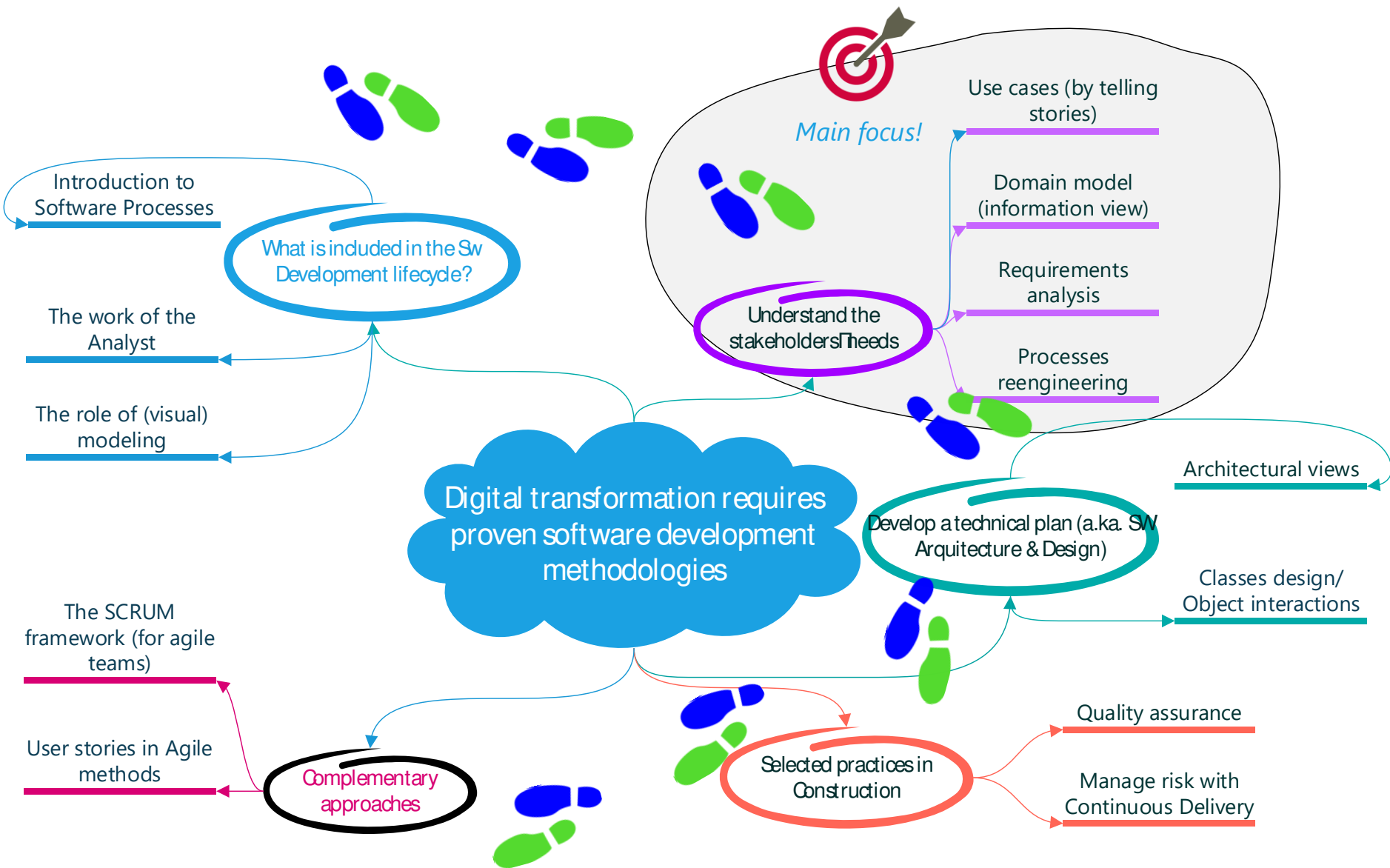
Usability

Tools

Management

1 Re Requirements Analysis	2 Ri Risk Analysis																	3 Ri Risk Analysis					
3 Ra Requirements Analysis	4 Dc Component Design																	5 Bcs Basic Coding Style	6 Sa Static Code Analysis	7 Ut Unit Testing	8 Rca Robot Code Review	9 At Code Analysis Tools	10 Ex Executable Measurement
11 Ar Atomic Requirements	12 Dbd Database Design																	13 Cr Code Refactoring	14 Da Dynamic Code Analysis	15 It Integration Testing	16 Uld User Interface Design	17 Ct Code Coverage Tools	18 Tam Test Management
19 Rt Requirements Templates	20 Sc Software Control	21 Sc Software Control	22 Rg Requirements Glossary	23 Bi Basics of ITIL	24 Bo Basics of ITIL	25 Ad Algorithm Design	26 Ol Object Oriented Languages	27 Scb Software Security Basics	28 Scc Software Security Basics	29 Pac Parallel Computing	30 Nm Numerical Mathematics	31 Cp Code Profiling	32 Vm Virtual Machines	33 Se Security Testing	34 Ua User Acceptance Testing	35 Rt Requirements Management Tools	36 Pmb Project Management Basics						
37 Rr Requirements Review	38 Ap Application Patterns	39 Ka Kernel Patterns	40 Rv Requirements Review	41 Do Device Management	42 Bm Basics of Management	43 Ds Data Structures	44 Fl Functional Languages	45 Eb Event Based Computing	46 Dbs Database Basics	47 Gd Global Data Structures	48 Rb Robot Basics	49 Cco Code Coverage Tools	50 Cm Complexity Metrics	51 Pt Performance Testing	52 Ua User Acceptance Testing	53 Ide Integrated Development Environments	54 Est Estimation Basics						
55 Tm Technical Management	56 Lsd Language Syntax Design	57-71 Appr Methods		72 Pc Project Management Basics	73 Mo Modeling Basics	74 Ade Algorithm Design	75 Aop Algorithm Optimization Basics	76 Ds Data Structures	77 Np Network Protocols	78 Dis Discrete Computing	79 Sma Small Machine Basics	80 Pac Parallel Computing	81 Cf Code Coverage Tools	82 Cc Code Coverage Tools	83 St Static Code Analysis	84 Tt Test Management Basics	85 Pt Performance Testing	86 Mos Modeling Basics					
87 Rem Requirements Management	88 Dn Design Basics	89-103 Sd Style			104 Mp Modeling Basics	105 lcm Lean Code Management	106 Tdm Test Data Management	107 Ddc Data Driven Computing	108 Pl Parallel Computing	109 Ws Web Application Basics	110 Ml Machine Learning	111 Ai Artificial Intelligence	112 Sdp Software Development Processes	113 Cr Code Coverage Tools	114 Dea Dependency Analysis	115 Ex Executable Measurement	116 Mt Modeling Basics	117 Vc Virtual Code Analysis	118 Pc Project Management Basics				
119 App Application Patterns	120 Pp Project Patterns	121 Td Test Data Management	122 Cd Code Coverage Tools	123 Cd Code Coverage Tools	124 Us User Acceptance Testing	125 Us User Acceptance Testing	126 Bm Basics of Management	127 Sm Software Management	128 Sm Software Management	129 Pp Project Patterns	130 Pp Project Patterns	131 No No Basics	132 Co Code Coverage Tools	133 Ti Test Management Basics	134 Ti Test Management Basics	135 St Static Code Analysis	136 St Static Code Analysis	137 Prs Project Review	138 Ts Test Management Basics				
139 Em Estimation Basics	140 Crr Code Coverage Tools	141 Cm Code Coverage Tools	142 Ns Network Security Basics	143 Rh Rhetoric	144 Is Intelligent Software Basics	145 Cr Code Coverage Tools	146 Ma Machine Learning	147 Ma Machine Learning	148 Lea Learning Basics	149 Gom Goal Management	150 Gom Goal Management	151 Phf Physical Basics	152 Phf Physical Basics	153 St Static Code Analysis	154 St Static Code Analysis	155 St Static Code Analysis	156 St Static Code Analysis	157 St Static Code Analysis	158 St Static Code Analysis				

<http://www.sw-engineering-candies.com/blog-1/periodic-table-of-software-engineering-know-how>



# Note on cooperative learning

**COOPERATIVE LEARNING** It leads to more and deeper learning and longer retention of information; greater development of high-level thinking, problem-solving, communication, and interpersonal skills; more positive attitudes toward engineering and science curricula and careers and greater retention in those curricula; and better preparation for the workplace.

## Richard Felder

Engineer

Richard M. Felder is the Hoechst Celanese Professor Emeritus of Chemical Engineering at North Carolina State University. [Wikipedia](#)





# How to study for AS?

## Attend the classes ;)

All topics in the Exam are addressed in classes, including some viewpoints/discussion questions.

Each presentation will cite the most relevant references/ book chapters (at the end).

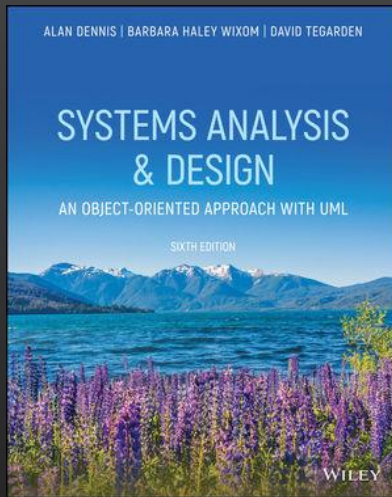
## Labs & project

Actively participate in every assignment.

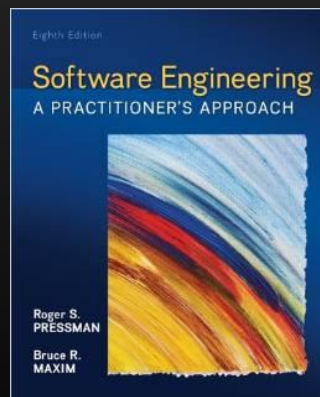
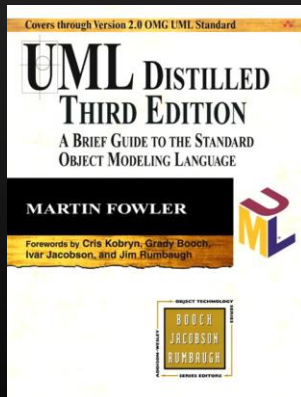
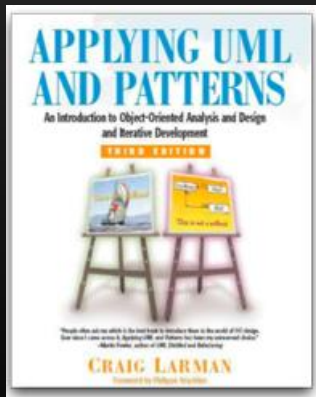
## Pitfalls

- ✗ distribute the tasks and cut the discussion in lab assignment... everybody should go through the "process".
- ✗ let the "smart volunteer" take all the responsibilities...

# Main references



See also selected  
reference is [Moodle](#)





# Schedule & labs submissions

	Segunda	Terça	Quarta	Quinta	Sexta
9:00			ASis 04.2.14 jfernan@ua.pt José Maria Amaral Fernandes P7 (P)		
9:30					
10:00					
10:30					
11:00		ASis ANF. V ico@ua.pt Ilídio Fernando de Castro Oliveira TP1 (TP)	ASis 04.2.07 jfernan@ua.pt José Maria Amaral Fernandes P6 (P)	ASis 04.2.17 ico@ua.pt Ilídio Fernando de Castro Oliveira P1 (P)	
11:30					
12:00					
12:30					
13:00					
13:30					
14:00	ASis 04.2.03 htz@ua.pt Helder Troca Zagalo P4 (P)				
14:30					
15:00					
15:30					
16:00	ASis 04.2.03 htz@ua.pt Helder Troca Zagalo P3 (P)				
16:30					
17:00					
17:30					
18:00					

Sigla	Código	Nome
ASis	41951	ANÁLISE DE SISTEMAS

Sigla	Tipologia
(P)	Prática
(TP)	Teórico-Prática