

## Course Syllabus

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**Jahangir Karimi** received the Ph.D. degree in management information systems from the [University of Arizona](#). He is professor of information systems and serves as the discipline director for [Information Systems program](#) at the [School of Business University of Colorado at Denver](#).

His research interests include information technology management in national and international environments, information systems modeling, analysis and design, software engineering, IT-enable E-business transformation, and new E-business models. He has published in [MIS Quarterly](#), [Information Systems Research](#), [Communications of the ACM](#), [Journal of Management Information Systems](#), [IEEE Transactions on Software Engineering](#), [IEEE Transactions on Engineering Management](#), [Decision Sciences](#), [Journal of Systems and Software](#), [Information and Software Technology](#), [Concurrency: Practice and Experience](#), several books, and conference proceedings.

He is on the editorial board of [International Journal of Electronic Commerce](#) and [IEEE Transactions on Engineering Management](#) Journal. Dr. Karimi is member of the [Association for Computing Machinery](#), [IEEE Computer Society](#), and the [Society for Information Management](#).

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**Course Description** Managing projects within an organizational context, including the processes related to initiating, planning, executing, controlling, reporting, and closing a project. Project integration, scope, time, cost, quality control, and risk management. In-depth coverage of software measurement methodologies, CMM, and existing metrics and tools for software project management. Students will study how a software measurement program can be introduced to an organization in order to collect necessary data from ongoing projects, to validate and interpret the collected data, and to maintain a corporate measurement database for projecting future software project's size, cost, and schedule.

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**Course Prerequisite** ISMG 6020 and ISMG 6060.

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**Course Objective** This course introduces the foundations of software measurement and estimation, and surveys the existing metrics/tools. It covers how a measurement program can be introduced in an organization in order to collect necessary data from ongoing software projects, to validate and interpret the data, and to maintain a corporate measurement database for projecting future software project's size/cost/schedule.

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**Required Texts**

<b>Required texts:</b>	<ul style="list-style-type: none"> <li>• <b>Software Project Management: A Unified Framework. W. Royce (WR), Addison-Wesley, ISBN 0201-309580, 1988</b></li> <li>• <b>Software Project Management in Practice. Pankaj Jalote (PJ), Addison Wesley Professional, 0-201-73721-3, 2002</b></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>On Time Within Budget: Software Project Management Practices and Techniques, 3rd edition, E. M. Bennatan, (EB)-Wiley, ISBN</b></li> </ul>

**Available texts:**

0471376442

- **Controlling Software Projects: Management, Measurement and Estimation (TD)**, Demarco (**Note:** This is classic book on software project management. The lectures will reference this book very frequently. I have also extracted key concepts of this book and have made them available in my lecture notes).
- **Function Point Analysis**, Dreger (**BD**) (**Note:** This book is out of print. The pdf files of chapters 1,2 and 5 of this book are available in the document sharing)

**Course Approach**

It is assumed that you will read the assigned chapters and readings in advance. The material covered in each unit closely follow the course text and the assigned readings (See the assigned readings for each unit for details). Each **audio** will give you an overview of the material covered in each unit and will highlight the important points only. However, the best way to approach the material for each unit is for you to read the (required) assigned readings in its entirety first and then listen to the audio for the given unit. You will have hard time following the lectures on an audio if you do not read the material first (just like normal class sessions). **Please note** the audio file for each unit is also available in the document sharing page. You can download the file and then listen to it or listen to it over the web (slower depending on your connection).

**Note we will cover one unit per week.** The date for each unit is the date by which you should finish the work for that unit (i.e., it is not the start date but the finish date). Examinations will be based on the textbook, readings, and class discussions. There are threaded discussions for each unit (except the first unit). You are expected to participate in the threaded discussions by the due dates. There are two projects and there are late penalties associated with late projects (see section on Course Policies).

**Philosophy of Learning:** This course reflects a learning-centered, rather than an instruction-centered, paradigm. Whereas the instruction-centered paradigm views learning as an essentially passive process of assimilating "downloaded" information transmitted by an instructor-expert, the learning-centered paradigm recognizes that learning involves the construction, by the learner, of new frameworks for understanding. Some of the assumptions and implications of following a learning-centered paradigm are:

- the course aims at producing learning, rather than merely providing or delivering knowledge
- student discovery and construction of knowledge are emphasized over transfer of knowledge from faculty to students
- knowledge exists in the mind of the student and is shaped by the students' experience; knowledge is not purely "objective"
- learning is student centered and controlled
- learning is cooperative, collaborative, and supportive rather than competitive
- talent and ability are seen as abundant among the students
- faculty are primarily designers of learning methods and environments

**Online small group discussions base on the reading materials:** The course schedule identifies the reading materials to be covered in each course unit. We will use the small group discussions for online class discussions. The discussions are where you will have lots of interactions with your classmates and me. Think of it as an in-class discussion, only better.

- You don't have to worry about being interrupted.
- You have time to consult your sources.
- You can reply to as few or as many threads as you want, in any order, no matter how old or new they are.

In a typical threaded discussion for a unit, I will pose a topic for discussion or a series of topics and you as the student, can respond to the topics and/or respond to the other students' responses (For detail

explanation of how this process works see "How do I communicate with my professor and the other students?" and the sub-sections "**Announcements**", and "**Threaded Discussions**" in the CU-ONLINE help section). You enter the threaded discussion by clicking on ""Enter Threaded Discussion"" in the main body of a unit page.

**Announcements:** I will use the announcements for communications. I will also be sending more urgent announcements to the class via an email mailing list, and will be happy to answer any questions about assignments, etc., via the announcements.

### Important E-mail addresses:

- All assignments must be turned in using the digital drop box feature of the CU-ONLINE system.
- For urgent communication, for which you need an immediate or same-day response. contact me at [jkarimi@carbon.cudenver.edu](mailto:jkarimi@carbon.cudenver.edu). This is my personal e-mail account and please use it with discretion. Class assignments should not be directed at this address. **You should post any question regarding course material to the Q & A page for a given unit, and avoid asking the question via sending me an email.**
- [helpdesk@cuonline.edu](mailto:helpdesk@cuonline.edu): For technical problems not directly related to the course content, such as inability to access the discussion boards, login problems, etc. The technology (servers, communication links, etc.) for CU-Online is managed by an independent company called eCollege.com, based in the Denver Tech Center, and the University or I have no control or jurisdiction over technology-related problems.

**Participation** Active participation in the threaded discussions is an important component of this course. It is expected that students will enrich the course through relevant discussions and contribution of personal knowledge and experience. ***You need to have a complete understanding of the required readings for a given unit first in order to be able to add value to the discussions, otherwise the discussion topic will be vague to you.*** Like most software development projects, the stated requirements may look vague and incomplete to begin with. **It is your responsibility (as a group) to have a complete understanding of what the requirements should be. Therefore you need to develop the requirements first in order to address the discussion topic for a given unit.**

**No late discussions will be accepted or allowed.** Each individual threaded discussion worth 10 points. The threads for the small group discussions worth 20 points. The points will add up and as a whole will be counted as your threaded discussions percentage of your grade (30%). It is a good idea to read over comments made by other students and to respond to the comments rather than repeating the comments that were made by others. **I encourage you to add value to the discussion rather than simply repeat what was said in the past.** Remember, the purpose of these threaded discussions is to learn from personal knowledge and/ or experiences of each other rather than just repeating what was said to get away with it. Examples of acceptable discussion material will include: (1) your own interpretations of issues discussed in the readings, (2) relating conceptual material from the readings to real-world examples, (3) drawing parallels with or integrating ideas covered in previous classes, (4) critiquing a classmate's analysis, (5) applying outside readings to the discussion at hand, and (6) demonstrating that you have carefully read the material and thought about it.

Evaluation of class participation will be based on substantive contribution to the class' overall learning experience, and not merely on how many times you entered your comments. **Your participation will be evaluated as follows:**

Rubric for Online Content Assessment	
Points	Skills
9-10	Demonstrates excellence in grasping key concepts; critiques the work of others; provides ample evidence of support for opinions; readily offers new interpretations of discussion material.
7-8	Shows evidence of understanding most of the major concepts; is able to agree or disagree when prompted; is skilled in basic level of support for opinions; offers an occasional divergent viewpoint.
5-6	Has mostly shallow grasp of the material; rarely takes a stand on issues; offers inadequate levels of

	support.
1-4	Shows no significant understanding of material.
<b>Rubric for Assessing Online Participation</b>	
<b>Points</b>	<b>Skills</b>
9-10	Contributions are prompt, timely, relevant, self-initiated; remarks are posted freely on all assignments throughout the course; there is no attempt to dominate conversation.
7-8	Student generally keeps up with the discussion; needs an occasional prompting to contribute; might participate in some discussions more than others.
5-6	Participation is spotty; picks and chooses topics to get involved in; offers short, perfunctory postings when prompted; takes limited initiative.
1-4	Student rarely participates freely; makes short, irrelevant remarks.

**Scholastic Dishonesty:** Any time you put your name on a piece of work for this course, you are asserting that it is your own work, except as otherwise indicated and permitted. If that is not the case, it is academic dishonesty, and under Business School rules, I am required to submit the matter to the College Internal Affairs committee for a decision. Regarding plagiarism, the source of any information you use must be reported using an appropriate citation format. Direct quotations must be indicated with quotation marks and page references.

### Grading Policies **Your grade will be based on the Following**

Projects 2 (10% each)	20 %
Mid-term Exam	25 %
Final Exam	25 %
Threaded Discussions	30 %
Class Participation and Instructor's discretion	(+/-) 5%

Letter grades will be assigned using the following scale:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-
95%	90%	87%	83%	80%	77%	73%	70%	67%	63%	60%

At the discretion of the instructor, grades will be "curved." However, no student will receive a grade less than that prescribed by the above schedule.

**Late work:** Late work, **with the exception threaded discussions**, will be accepted up to one week following the scheduled due date. Late work is subject to a penalty of 10% of the maximum possible credit for the assignment.

**Examination Policy:** *Make up exams are not given.* The only acceptable excuses for missing an exam are circumstances clearly outside your control, such as illness, death in family, etc. If you miss an exam, notify me as soon as possible. I may require documentation of the circumstances.

**Course Resources** For useful web sites and resources for Project Management click here: [Project Management Resources](#)

### WWW Links of Interest:

The following links are provide for information only and do not imply endorsement by the University of Colorado of the offerer's products or services.

<a href="#">Software Measurement</a>	<a href="#">Software Methods and</a>	<a href="#">The Software Quality</a>	<a href="#">Software Engineering</a>
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	<a href="#">Tools</a>	<a href="#">Page</a>	<a href="#">Resources</a>
<a href="#">Software Quality Engineering</a>	<a href="#">Predicate Logic Software Systems Inc</a>	<a href="#">Welcome to ISO Online</a>	<a href="#">Software Engineering Institute Information Server</a>
<a href="#">Object Oriented Software Metrics</a>	<a href="#">COCOMO II</a>	<a href="#">International Organization for Standardization</a>	<a href="#">Software Productivity Center</a>
<a href="#">IEEE Technical Council on Software Engineering</a>	<a href="#">CQI Server Home Page</a>	<a href="#">SR/Institute's Software Quality HotList</a>	<a href="#">Year 2000 Info Center</a>

***Software project management encompasses a wide array of subtopics. The following books provide general coverage or in some cases focus on a single topic that is implied by the title:***

Abdel-Hamid, T. and S.E. Madnick, Software Project Dynamics, Prentice-Hall, 1991.

This book presents an "integrative model" of software project management that focuses on four areas: human resource management, software production, project control and project planning. The authors use the notation of system dynamics to model the software process.

Boddie, J., Crunch Mode, Prentice-Hall, 1987.

Recommended reading for all managers who "have 90 days to do a six month project." This book focuses on the real life compromises that occur when time pressure overrides all else.

Boehm, B., Software Engineering Economics, Prentice Hall, 1981.

Written by the director of software development for TRW, this book presents a comprehensive treatment of software estimating, project planning and control. Somewhat mathematical and technical in parts, the text introduces Boehm's COCOMO estimation modeling scheme and provides useful data on software development productivity.

Boehm, B., Risk Management, IEEE Computer Society Press, 1989.

An excellent tutorial on risk analysis and management, this book contains many excellent papers on risk and related topics as well as Boehm's notes on the subject. Presents a number of worthwhile checklists, forms and guidelines for managing risk.

Dorf, R.C. (editor), Technology Management Handbook, CRC Press, 1998.

A comprehensive handbook for technology managers that address economics, organizations, human resources, statistics, accountings, project management, production techniques, legal issues and many other important topics. [Does not focus solely on software.]

Charette, R., Software Engineering Risk Analysis and Management, McGraw-Hill, 1989.

One of the first books dedicated to risk assessment and its role in the management of software projects. Topics covered include risk identification, estimation, evaluation, and control.

Charette, R., Application Strategies for Risk Analysis, McGraw-Hill, 1990.

This book, a companion volume to Charette (1989), is the most comprehensive treatment published to date of the pragmatic aspects of risk analysis in the software engineering context.

DeMarco, T., Controlling Software Projects, Yourdon Press, 1982.

A thorough and pragmatic treatment of all important aspects of software management. Excellent sections on project metrics and a useful discussion of software quality issues.

Gilb, T., Principles of Software Engineering Management, Addison-Wesley, 1988.

A thought-provoking discussion of software engineering and its management by an industry iconoclast

and respected consultant. Gilb discusses everything from scheduling to risk assessment, from walkthroughs to motivation of staff. An interesting read.

McConnell, S., *How To Run Successful Projects*, Prentice Hall, 1994)

This book presents pragmatic guidance for managers who have to deal with the vagaries of everyday business pressures.

McConnell, S., *Software Project Survival Guide*, Microsoft Press, 1998)

This book presents still more pragmatic guidance for managers who have to get projects out the door under heavy time pressure. It draws on the SEI's CMM and guidelines suggested by NASA, but is written in an extremely readable and effective style.

Pigoski, T.M., *Practical Software Maintenance*, Wiley, 1997.

One of the few modern books that address this critically important topic, Pigoski provides useful strategies for maintenance.

Muller, R.J., *Productive Objects: An Applied Software Project Management Framework*, Morgan-Kaufmann Publishers, 1997. ISBN 1-55860-437-5

One of the first book-length treatments of project management issues with specific emphasis on OO projects.

Pressman, R.S., *A Manager's Guide to Software Engineering*, McGraw-Hill, 1993.

This book used a question and answer format to present a complete discussion of software engineering (at a manager's level). Contains four parts, the book addresses the product and the process, presents a strategy for technology transition, and discusses project management.

Pressman R. S. and S.R. Herron, *Software Shock*, Dorset House, 1991.

A book on software that is directed toward the non-technical professional. The people, the process, the tools, the problems and the opportunities are each covered. Makes excellent reading for senior managers and others who must understand the danger and opportunity offered by software.

Reifer, D.J., *Software Management*, IEEE Computer Society Press, 5th edition, 1997.

Thayer, R.H., *Software Engineering Project Management*, IEEE Computer Society Press, 2nd edition, 1997.

These classic anthologies contain an excellent selection of important papers on software project management..

Weinberg, G.M., *Quality Software Management*, volumes 1 and 2, Dorset House, 1992, 1993.

This book is the first of three volumes that focus on quality and the management methods that can be used to achieve it. Filled with excellent metaphors, examples and wisdom, this book makes worthwhile reading for managers at all levels