



AGILE SOLUTIONS FOR GREATER INNOVATION

ENCE 607.3X, Nov 2018 – Nov 2019

COURSE DESCRIPTION

ENCE 607.3X Agile Solutions for Greater Innovation - Innovation differentiates companies in the products produced, and the impact those products have on their customer's lives. In this course, you will learn how innovation and speed are tightly linked, and the benefits of better targeting and solutioning in achieving faster benefits delivery. Faster delivery leads to faster feedback for learning; and faster learning leads to higher quality solutions at speed. But beyond the emphasis on fast iterative development, you will also learn about the practices that create structure and space for innovation in Agile that are missing from traditional management. These paradigm shifts include:

- Delivering business value, not technical scope with User Stories
- Using Cross-functional teams and user stories to gather accurate requirements
- Leveraging constraints to derive creative capability solutions.
- Applying Test-Driven Design (TDD) to deliver better designs with less designing

By following best practices of Agile, including timeboxes, constraint-based thinking processes, and empathetic problem solving, you'll learn how to provide a sustainable innovation environment for your teams.

COURSE OBJECTIVE

Learn the project management principles and essential planning techniques that will enable you solve seemingly impossible problems and ensure project success through aligned objectives, accurate requirements, and managed uncertainty:

- How Agile manages solution risk and return more effectively
- Accurate, effective requirements gathering that avoids delusional "perspective taking"
- Paradox of structure, aka "how constraints drive creativity and luck!"
- Test-driven development for faster, better solutions in complex systems
- How to target scope to meet Performance Objectives via the Theory of Constraints

LOGISTICS

<i>Time & Location</i>	This course is a self-paced and can be accessed on edX at the following link: https://www.edx.org/course/driving-speed-through-agile-planning
<i>Instructor</i>	John Johnson, Adjunct Professor, UMD, Project Management
<i>Learning Management System (ELMS)</i>	EdX is the Learning Management System. It contains all lecture videos with captions, the Summary Points that serve as the class notes for each video, and the knowledge checks to ensure continuous synthesis of the material. EdX also contains the materials available only to verified students as supplemental materials for learning and implementing these lessons in your workplace. Finally, the two exams are included, with one for auditing students and one for enrolled verified learners.
<i>Standard Weekly Content</i>	<p>Preparation (Prep) – considerations before viewing the video lecture (text)</p> <p>Video Lecture – video lecture on course content (video)</p> <p>Summary Points – captures essential points needed for knowledge retention (text)</p> <p>Knowledge Check – tests knowledge learned from the lecture and summary (quiz)</p> <p>References – additional information useful and relevant to the course (text)</p>

GRADING

Knowledge Checks (64%) – Each lesson has one knowledge check; you can submit infinite number of times. Each Knowledge Check has three questions. This is entirely to help you understand your understanding of the material.

Timed Final (30%) – The course has a Timed Exam with twenty (20) questions that you can submit only once. It is intended to test your retention and offer a faster means of passing the course.

Open Final (6%) – The course has a second Open Final with twenty (20) questions that you can submit answers to an infinite number of times, just like a Knowledge Check. This can be used as preparation for the Timed Final or you can pass the course by answering all questions on this Open Final and the Knowledge Checks correctly.

Passing Grade: 70%

PRE-REQUISITES

There are no prerequisites for this course. It is expected that you'll understand general business and some engineering terminology, since this is an engineering course focused on delivering working products for customers.

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Class materials are the property of the instructor – please do not sell them or post them on a website. Please also be reminded that course materials may not be reproduced for anything other than personal use without the permission of the course instructor. As a student, you own the work that you create as part of your University academic and research activities.

TIME COMMITMENT

As a self-paced course, you can decide when to take each lesson. Our recommendation is that you follow the syllabus and perform each section within one week. The typical workload for a lesson will include:

- Reading and considering the "Prep" introduction (1 minute)
- Watching the Video Lecture (4 to 8 minutes)
- Reading the Summary Points on the Video Lecture (3 minutes)
- Taking the Knowledge Check to test your learning (3 minutes)
- (Optional) References reading at the end of each lesson (0-5 minutes or more)

This mean ***each lesson will take from 15 to 20 minutes to complete.*** There are five lessons per week, so ***each week should take about 1.5 hours to complete.***

At the end of the four weeks is a Final that counts for half of the entire grade of the course. Before you choose to take the Final, we recommend you consider Verifying for the course. Verified Learners gain access to great tools and references found in the handout sections.

The Final Exam should take no longer than 60 minutes to complete.

In total, at least ***seven (7) hours are needed to complete all the lessons and the Final Exam.*** Although we expect that most students will need more on the order of ten (10) hours to review and watch videos a second time, as well as study for the Final.

Again, this is a self-paced course, so we highly recommend that students take their time and invest themselves in understanding the densely packed video lectures and concepts introduced.

CODE OF ACADEMIC INTEGRITY

The University of Maryland (UMD) is an academic community and its fundamental purpose is the pursuit of knowledge. Like all other communities, UMD can function properly **ONLY** if its

members adhere to clearly established goals and values. Essential to this fundamental purpose is the commitment to the principles of truth and academic honesty. UMD's Code of Academic Integrity is designed to ensure that the principle of academic honesty is upheld. While all members of the community share this responsibility, the Code of Academic Integrity is designed so that special responsibility for upholding the principle of academic honesty lies with the students.

Academic integrity refers to a set of shared values, principles, behaviors, and skills that lie at the heart of learning and scholarship. Students are expected to maintain the highest level of integrity throughout their academic pursuit. Intellectually honest academic work represents independent analysis and acknowledges all sources of information that contribute to the ideas being explored. The failure to uphold academic integrity includes: falsification of data; improper assignment of credit; and any representation of the ideas, words, or work of others as one's own. When students misrepresent their work, faculty cannot accurately assess their performance or provide the feedback students need to learn. Students who plagiarize or cheat harm themselves and ultimately damage the value and reputation of education for everyone.

Any violation of academic integrity will result in the professional certificate not being awarded, assuming the student is on the certification path. Academic integrity violations in this course would include: sharing of answers to the knowledge checks and final exam in any electronic form. Violations will result in the student being removed from the class.

INSTRUCTOR & TEACHING ASSISTANT SUPPORT

This is a self-paced course that is designed to allow you to learn and discover at your own pace and time. However, should you get stuck and need assistance because of issues related to course content, please don't hesitate to reach out to the teaching team. The Instructor and the Teaching Assistants supporting the course will answer questions as quickly as possible to emails sent to "agilepmedx2018" at "gmail.com."

CLASS SCHEDULE OVERVIEW

WEEK	HIGH-LEVEL DESCRIPTION
1	The first week of Innovation revisits concepts of capability delivery from technical perspective; asking how do we achieve a project's purpose to innovate? What are the risks and methods to be successful in delivering a defined output under uncertain conditions? Here the Theory of Constraints (TOC) is used to target innovation for maximum impact.
2	The second week dives into the requirements gathering and validation process, and the science behind the most powerful requirement tool, a User Story, and how it forms the basis for Test-Drive Development (TDD). During this week we'll also explore the power of visual-based requirements gathering and prototyping for faster feedback and validation of requirements.
3	The third week looks at how adding constraints to solutioning unleashes creativity, luck, and productivity towards solving hard, uncertain problems.
4	The fourth week culminates with the application of the TOC Thinking Processes, User Stories, and Constraints along with the use of the powerful system engineering solutioning techniques (isolation, absorption, acceleration, etc.) and tools like TRIZ.

CLASS SCHEDULE DETAILS

Lesson	Week	Topic	Knowledge Check
Week 1			
1	1	Innovation Challenge	X
2	1	Searching for Solutions	X
3	1	Startup Innovation	X
4	1	Product Innovation	X
5	1	Process Innovation	X
Week 2			
6	2	Empathic Case Studies	X
7	2	Perspective Getting	X
8	2	Power of Stories	X
9	2	Writing Great User Stories	X
10	2	Visual Requirements & TDD	X
Week 3			
11	3	Stardust Case Study	X
12	3	Limiting Innovation	X
13	3	Small Batch Innovation	X
14	3	Lucky Constraints	X
15	3	Agile Portfolios	X
Week 4			
16	4	Navy Energy Case Studies	X
17	4	Managing Uncertainty	X
18	4	Solving The Impossible	X
19	4	Apply TRIZ with MBSE	X
20	4	Leading Innovation with Control	X
20+	4	Final Exam	