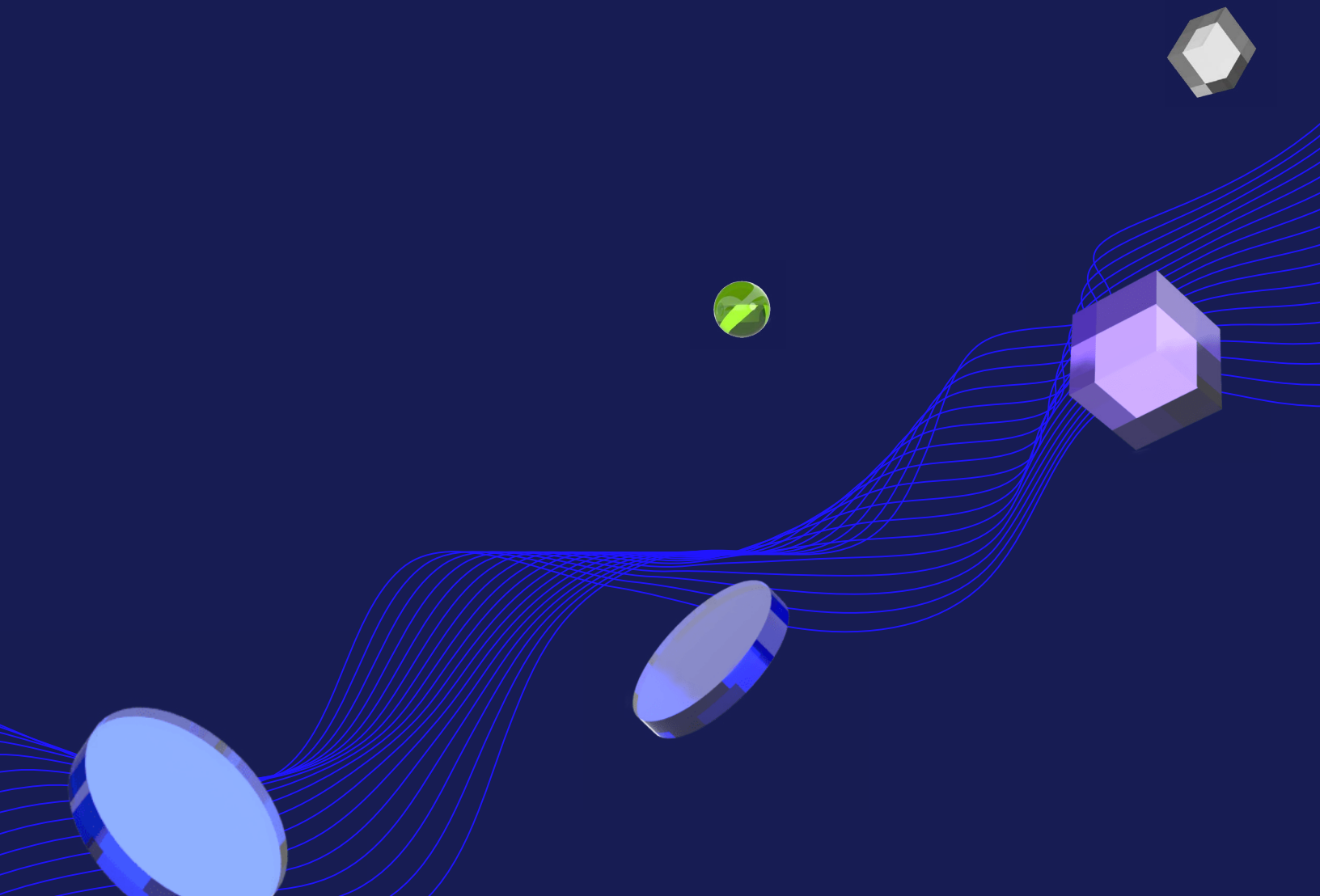


# Agile Software Development

Nanodegree Program Syllabus



# Overview

Learn how to build products that deliver continuous value to customers using an Agile approach to software development. By the end of this program, learners will be able to differentiate between Scrum, Kanban, and XP; create an environment that fosters high performing teams, and manage iteration planning using Agile techniques. Learners will also be able to create a release plan for a Minimum Viable Product, create metrics that show project status, and effectively communicate progress both within and outside of the development team.



## Learning Objectives

**A graduate of this program will be able to:**

- Master characteristics of three of the more popular Agile frameworks: Scrum, Kanban, and XP.
- Apply the Agile Manifesto to deliver practical value in Agile teams and organizations.
- Apply Agile planning and prioritization within a team or organization.
- Apply the Scrum framework to plan a release and a sprint.
- Identify and mitigate risk while building an internal team communication and external communication strategy.
- Create a BVIR to communicate project status to the relevant team/stakeholders effectively.

# Program information



## Estimated Time

3 months at 10hrs/week\*



## Skill Level

Beginner



## Prerequisites

No prior experience is required, but it is recommended that learners are comfortable with basic computer skills, such as managing files, using third-party online programs, and navigating the internet through an online browser.



## Required Hardware/Software

None

\*The length of this program is an estimation of total hours the average student may take to complete all required coursework, including lecture and project time. If you spend about 5-10 hours per week working through the program, you should finish within the time provided. Actual hours may vary.

# Foundations of Agile & Agile Frameworks

In this course, learners will be introduced to the Agile Mindset and how it sets the tone for “being” Agile versus just “doing” Agile. Learners will leverage the Agile Manifesto as the foundation of all Agile frameworks, as well as identify the practical differences between Agile and Waterfall approaches. They will then take a deep dive into Agile teams and governance and apply best practices of both in order to deliver immense business value. By the end of this course, learners will master characteristics of three of the more popular Agile frameworks being utilized across all industries, which are Scrum, Kanban, and XP, as well as apply the Agile Manifesto to deliver practical value in Agile teams and organizations.



## Course Project

### WorldVisitz Mobile App Agile Delivery Launch

In this project, learners will step in as an Agile consultant to help launch WorldVisitz’s Agile journey. They will recommend and define an Agile delivery solution for WorldVisitz executives to replace their current inefficient traditional product development processes. Based on an assessment of the organization, learners will prepare a presentation to convince WorldVisitz leaders of the business value and rationale for adopting an Agile framework. They will also prepare an Agile onboarding presentation to get the team started on their Agile journey.

## Lesson 1

### Why Agile?

- Explain the Agile Mindset and how it sets the tone for “being” Agile versus just “doing” Agile.
- Identify how the Agile Manifesto sets the foundation for all Agile frameworks.
- Compare Agile versus the more traditional Waterfall approach to product development.
- Evaluate common misconceptions about Agile.

## Lesson 2

### Build & Evolve Agile Teams

- Recognize the characteristics of a high performing Agile team.
- Sustain and enable high performing teams.
- Identify an Agile team's core roles, optimal size, structure, and cross-functional skills.
- Apply best practices of Agile governance.

## Lesson 3

### Agile Frameworks

- Compare and contrast Scrum, Kanban, and XP.
- Evaluate the unique characteristics of the Scrum framework and appropriate uses.
- Evaluate the advantages of the Kanban Framework and its appropriate uses.
- Evaluate the advantages of the XP Framework and its appropriate uses.

## Course 2

# Delivering Value with Agile Planning and Prioritization

The Agile approach to planning is an iterative process that focuses on delivering value to the customer. In this course, learners will be introduced to the high level aspects of Agile planning, including product vision and roadmaps. They will also learn how to manage requirements at the tactical level, including gathering, writing, and prioritizing requirements using Agile techniques from each of the major frameworks. Finally, learners will learn different approaches to estimating work and how to build release and iteration plans that help the team continuously deliver value. At the end of the course, learners will be equipped with the tools and techniques they need to apply Agile planning and prioritization within a team or organization to deliver value more efficiently.



## Course Project

# Create an MVP Release Plan

In this project, learners will create a plan to develop a software product for the Centers for Disease Control that will help prevent the spread of a deadly virus. Learners will be given a specific set of criteria to create a plan for the customer. The plan will include a vision, roadmap, user stories, and a release plan that outlines the minimum set of features that are needed to make the product successful and align with business requirements for an MVP.

## Lesson 1

### Agile Planning

- Describe the benefits of agile planning.
- Explain the MVP concept and understand how it's used in software development.
- Construct a product roadmap.
- Create user stories that describe product requirements.
- Understand the difference between features, epics, and user stories.
- Identify acceptance criteria for user stories.

## Lesson 2

### Prioritization

- Define the product backlog and explain why it exists.
- Explain how each team role uses and interacts with the backlog.
- Manage a backlog and organize it using progressive elaboration.
- Identify and apply different prioritization techniques.
- Prioritize a product backlog.

### Lesson 3

#### Scoping

- Understand how to control the scope of user stories.
  - Refine the Definition of Done for user stories.
  - Estimate user stories.
  - Explain and apply various estimation techniques.
  - Apply ideal time to estimates.
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### Lesson 4

#### Release & Iteration Planning

- Explain the relationship between release and iteration planning.
- Identify the outcomes of release and iteration planning.
- Plan an MVP that delivers value incrementally by using techniques such as continuous integration and continuous delivery.
- Explain and apply timeboxes.
- Apply the Scrum framework to plan a release and a sprint.

## Course 3

# Progress, Communication & Organizational Agility

Learn how to communicate project progress and status through information radiators. Additionally, learn to guide and direct organizational agility through the use of metrics and differentiate between patterns to mimic and anti-patterns to avoid. Next, learn to identify and mitigate risk, while building an internal team communication strategy and an external communication strategy that work effectively for the relevant stakeholder audience.



## Course Project

# Report Agile Project Status with a Big Visual Information Radiator

In this project, learners will plan, organize, monitor, and display project information at a glance. Learners will create a Big Visual Information Radiator (BVIR) that can be used by anyone involved in an Agile project to review project goals, target completion dates, and work completion status, metrics, and risks. Learners will use burn-up and burn-down charts, prioritize user stories, identify risks, and calculate velocity. Learners will also effectively communicate project status and appropriate key metrics to a senior management audience within a corporation.

## Lesson 1

### Agile Metrics

- Explain the importance of using metrics in Agile.
- Differentiate between outputs and outcomes.
- Calculate a velocity.
- Determine the lead time and cycle time.
- Monitor the status of Work in Progress (WIP).
- Estimate when work should be completed.
- Identify escaped defects and how to handle them appropriately.



- Identify the different parts of the continuous improvement process that lead to a sustainable development level.
  - Differentiate between patterns and antipatterns of the continuous improvement process.
  - Effectively apply Agile thinking to reach sustainable development.
  - Run a retrospective to effectively identify what went well, what didn't go well, and what can be improved.
  - Effectively prioritize the next steps to improve on the lessons learned and add it to the backlog.
  - Use the appropriate chart type to build an IR to communicate a specific metric.
  - Create a BVIR to effectively communicate project status.
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## Lesson 2

### Measuring Progress & Impact

## Lesson 3

### Identifying Risks

- Determine the impact risk would have on a project.
  - Effectively communicate how technical debt impacts a project.
  - Apply Agile techniques to mitigate technical debt effectively.
  - Identify failure patterns and implement mitigation strategies.
  - Use testing techniques early to keep an Agile project on schedule.
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## Lesson 4

### Agile Communication

- Differentiate between metrics that should be shared internally vs. externally.
- Create a BVIR to communicate project status to the relevant team/stakeholders effectively.
- Correctly determine the status of the current in-progress project.
- Effectively implement tools to communicate across remote teams.
- Build a communication strategy for an internal team and for external parties.
- Build trust using Agile techniques between team members to encourage transparency in communication.

# Meet your instructors.



## Hasnain Rizvi

### Senior Agile Coach

Dr. Hasnain Rizvi is an Agile transformation thought leader and has trained over 25,000 professionals globally. He is a trainer and adjunct professor for Global 2000 clients, universities, and organizations including the University of British Columbia, Southern Alberta Institute of Technology, and Steinbeis School of International Business and Entrepreneurship.



## Mark Ginise

### Agile Engineer & Coach

Mark Ginise leads Agility training for the federal government. He has taught Agility to DoD programs, and worked as an internal change agent for Federal Government agencies. His specialties include Agile transformations, DevSecOps, cloud migrations, and technology education. He enjoys the beach, his children, and traveling.

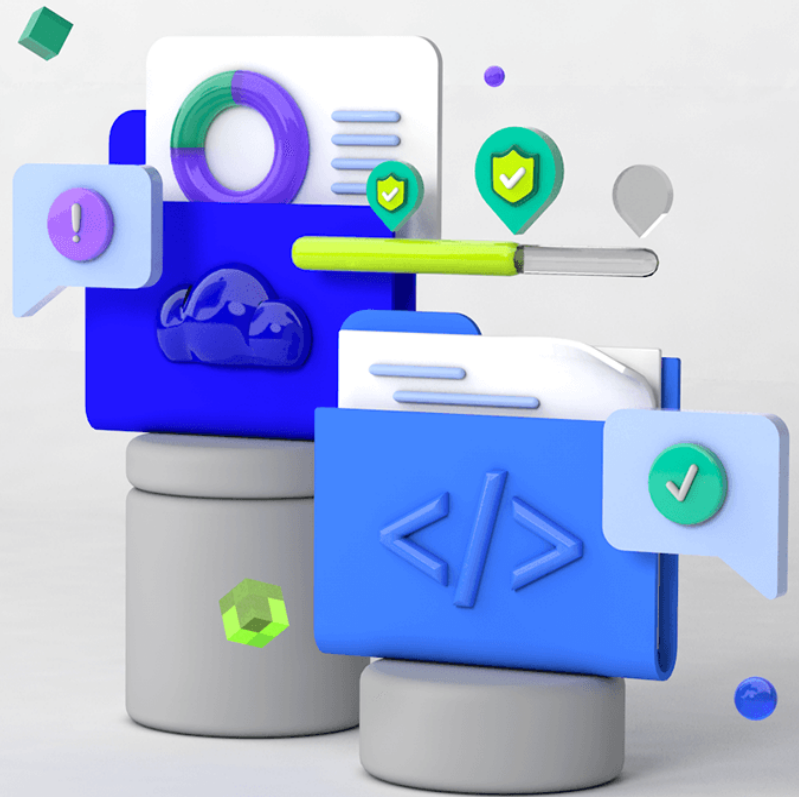


## Vincent High

### Agile Delivery & Transformation Lead

Vincent is a Scrum Master, Agile instructor, and currently serves as an Agile Delivery Lead at a top US bank. Throughout his career he has served as a Scrum Master and Agile coach within startups, large corporations, and non-profit organizations. In his spare time he enjoys watching old movies with family.

# Udacity's learning experience



## Hands-on Projects

Open-ended, experiential projects are designed to reflect actual workplace challenges. They aren't just multiple choice questions or step-by-step guides, but instead require critical thinking.



## Knowledge

Find answers to your questions with Knowledge, our proprietary wiki. Search questions asked by other students, connect with technical mentors, and discover how to solve the challenges that you encounter.



## Workspaces

See your code in action. Check the output and quality of your code by running it on interactive workspaces that are integrated into the platform.



## Quizzes

Auto-graded quizzes strengthen comprehension. Learners can return to lessons at any time during the course to refresh concepts.



## Custom Study Plans

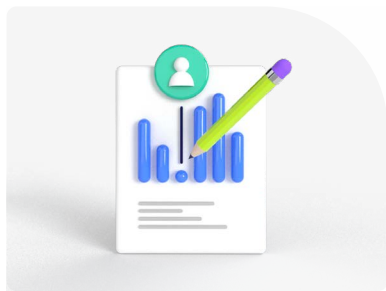
Create a personalized study plan that fits your individual needs. Utilize this plan to keep track of movement toward your overall goal.



## Progress Tracker

Take advantage of milestone reminders to stay on schedule and complete your program.

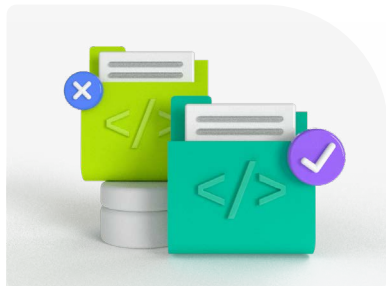
# Our proven approach for building job-ready digital skills.



## Pre-Assessments

### Identify skills gaps.

- In-depth assessments benchmark your team's current level of knowledge in key areas.
- Results are used to generate custom learning paths.



## Experienced Project Reviewers

### Verify skills mastery.

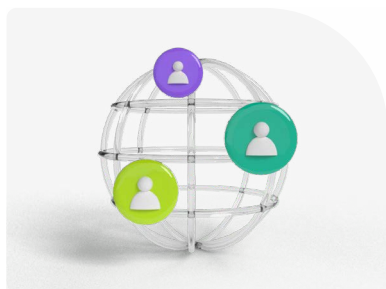
- Personalized project feedback and critique includes line-by-line code review from skilled practitioners with an average turnaround time of 1.1 hours.
- Project review cycle creates a feedback loop with multiple opportunities for improvement—until the concept is mastered.
- Project reviewers leverage industry best practices and provide pro tips.



## Technical Mentor Support

### 24/7 support unblocks learning.

- Learning accelerates as skilled mentors identify areas of achievement and potential for growth.
- Unlimited access to mentors means help arrives when it's needed most.
- 2 hr or less average question response time assures that skills development stays on track.



## Mentor Network

### Highly vetted for effectiveness.

- Mentors must complete a 5-step hiring process to join Udacity's selective network.
- After passing an objective and situational assessment, mentors must demonstrate communication and behavioral fit for a mentorship role.
- Mentors work across more than 30 different industries and often complete a Nanodegree program themselves.



## Dashboard & Reporting

### Track course progress.

- Udacity's enterprise management console simplifies management of bulk enrollments and employee onboarding.
- Interactive views help achieve targeted results to increase retention and productivity.
- Maximize ROI while optimizing job readiness.

Learn more at

[udacity.com/enterprise](https://udacity.com/enterprise) →