

SCRUM Syllabus

- Version: 3.2
- Approval: ITEMO working group
„Agile project management according to SCRUM”
- Valid from: 01.10.2020



Introduction

Note: This is the English translation of „SCRUM Lehrplan“, Version 3.2. In case of doubt, the German version always applies in its most recent version.

This Syllabus is the basis for SCRUM trainings and SCRUM exams according to ITEMO.

It has been collected together to the best of its knowledge and belief by members of the SCRUM working group of ITEMO.

The basis for this syllabus is in addition to the official Scrum Guide by Ken Schwaber and Jeff Sutherland (November 2017) a variety of other sources that complement the themes of syllabus.



Online available sources are described on the corresponding topics in the syllabus.

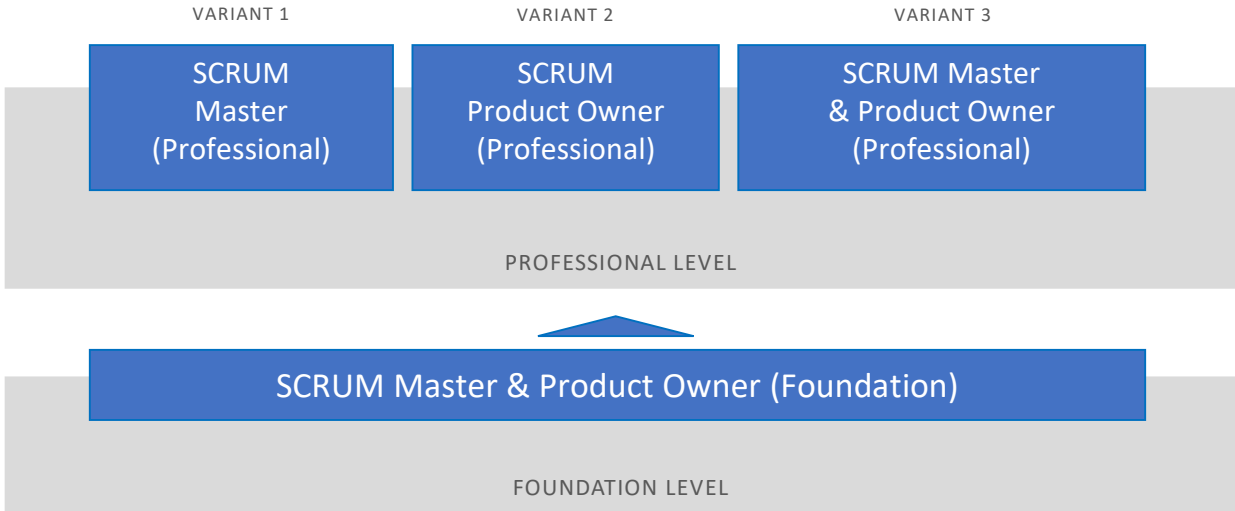
SCRUM Guide:

The current version of the SCRUM Guide is available at <https://scrumguides.org>

Additional references:

- „Scrum: Produkte zuverlässig und schnell entwickeln“ – 2016 by Boris Gloger
- „Scrum in der Praxis: Erfahrungen, Problemfelder und Erfolgsfaktoren“ – 2015 by Sven Röpstorff and Robert Wiechmann
- „Learning Agile: Understanding Scrum, XP, Lean, and Kanban“ – 2014 by Andrew Stellman, Jennifer Greene
- „Scrum für Dummies“ – 2014 by Michael Franke
- „Scrum - Agiles Projektmanagement erfolgreich einsetzen“ – 2007 by Roman Pichler
- „User Stories Applied: For Agile Software Development“ – 2004 by Mike Cohn

Training scheme



General Information

The time constraints are a requirement for how long a presence training must take. The duration of the classroom training can be reduced to 60% of the time if appropriate learning forms (e.g. e-learning) ensure that the content to be conveyed in the curriculum is adequately brought closer to the training participant.

The contents of the syllabus are on the color-coded slides.

The contents of the professional training are divided into a general first part, which is part of the SCRUM Master and Product Owner training.



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SCRUM Foundation

- Purpose
 - Imparting basic knowledge about SCRUM
 - Understanding of agile ways of working and agile methods
- General
 - No previous knowledge required
- Time limit
 - 18 x 45 minutes
(13,5 hours)



SCRUM Foundation

- Content

- Introduction of agile methods
- SCRUM - An agile framework (overview)
- SCRUM - Roles
- SCRUM - Sprints
- Requirements Engineering in SCRUM
- Measurement of the development progress
- Release Management
- Large and distributed development projects
- Further topics



Distribution of the contents

#	Content/Topics	Percentage
FND1	Introduction of agile methods	10%
FND2	SCRUM – An agile Framework (Overview)	10%
FND3	SCRUM – Roles	10%
FND4	SCRUM – Sprints	20%
FND5	Requirements Engineering in SCRUM	15%
FND6	Measurement of the development progress	10%
FND7	Release Management	10%
FND8	Large and distributed development projects	10%
FND9	Further Topics	5%



Introduction of agile methods

- Motivation for agile methods & comparison with traditional methods
- Classical project management: waterfall model
- The Agile Manifesto - The 4 core values of the Agile Manifesto
- Characteristics of agile methods - People as focus, Empirical, Iterative, Flexibility, Customer orientation



Further sources:

- <https://de.wikipedia.org/wiki/Wasserfallmodell>
- <http://agilemanifesto.org>
- https://www.standishgroup.com/sample_research_files/CHAOSReport2015-Final.pdf
- <https://de.wikipedia.org/wiki/Chaos-Studie>

SCRUM – An agile Framework (Overview)

- Rolling: SCRUM Team, Development Team, SCRUM Master, Product Owner
- Events (rituals): Sprint, Sprint Planning, Daily SCRUM, Sprint Review, Sprint Retrospective
- Artifacts: Product Backlog, Sprint Backlog, Product Increment
- Values: Courage, Focus, Commitment, Respect, Openness
- Central characteristics and aspects of SCRUM: Early problem recognition, customer satisfaction,
- Authorization of employees



Further sources:

- <https://de.wikipedia.org/wiki/Scrum>

SCRUM – Roles

- **Product Owner**
 - Tasks and characteristics, representative of customer needs, cooperation with the team, requirements engineering, acceptance of results, release management, responsibility for development success
- **Development Team**
 - Tasks and characteristics, implementation of requirements, decision-making authority, self-organization, authorization, interdisciplinarity, team size, team phase model (Tuckman)
- **SCRUM Master**
 - Tasks and characteristics, establishment of the SCRUM process, obstacles (impediments), moderation, coaching



Further sources:

- <https://de.wikipedia.org/wiki/Scrum#Rollen>
- <https://de.wikipedia.org/wiki/Scrum#Rollenkonflikte>

SCRUM – Sprints

- Iterations (Sprints), duration, connections of several Sprints
- Sprint Planning: goal, characteristics, process, task distribution, acceptance criteria, assessments, tasks, commitment driven planning, team capacity in the next sprint
- Daily SCRUM: Aim, characteristics, process, techniques, questions to be answered
- Sprint Review: Goal, characteristics, process, customer feedback, acceptance of results, definition of done
- Sprint Retrospective: Goal, properties, procedure, rules, measures, root cause analysis
- SCRUM Taskboard (Sprint Backlog): Target, content, structure, update
- Impediments Backlog: Aim, properties, treatment of disturbing factors
- Progress measurement in sprint: Sprint Burndown, End-of-sprint Report



Further sources:

- <https://de.wikipedia.org/wiki/Scrum#Ereignisse>

Requirements Engineering in SCRUM

- product backlog: Features, requirements management, prioritization, detailing, estimation of effort (Story Points, Planning Poker), maintenance of the Product Backlog
- Product concept - From the idea to the product backlog
- Description of requirements in SCRUM: Differences to classical RE, Incremental innovation
- User Stories: Features and use cases, acceptance criteria, splitting stories, INVEST properties
- Prioritization: criteria of prioritization, value-risk matrix according to Cohn, MoSCoW prioritization



Further sources:

- https://de.wikipedia.org/wiki/Scrum#Product_Backlog
- <https://de.wikipedia.org/wiki/Scrum#Planungspoker>
- <https://de.wikipedia.org/wiki/MoSCoW-Priorisierung>
- <https://tools.ietf.org/search/rfc2119>
- <https://xp123.com/articles/invest-in-good-stories-and-smart-tasks/>
- <https://blog.seibert-media.net/blog/2010/11/29/user-stories-anforderungen-aus-nutzersicht-dokumentieren/>

Measurement of the development progress

- Release Burndown
- Velocity (development speed), influencing variables of the velocity
- Other possible metrics



Further sources:

- https://de.wikipedia.org/wiki/Scrum#Transparenz_des_Fortschritts
- <https://de.wikipedia.org/wiki/Scrum#Burn-Down-Chart>

Release Management

- Relationships between the planning levels - task, story, sprint, release
- Release planning: estimation of effort and velocity, determination of the implementation sequence



Further sources:

- <https://blogs.itemis.com/de/releasemanagement>

Large and distributed development projects

- Basics, challenges, requirements, integration and introduction of multiple teams, communication, growth, examples of frameworks for scaling SCRUM
- Product Owner Team, Chief Product Owner, Product Owner Team as SCRUM Team
- Feature and component teams, division of work organization
- Multiteam coordination: SCRUM-of-SCRUMs



Further sources:

- <https://less.works>
- <https://jaxenter.de/gross-und-fragil-feature-team-schlaegt-komponenten-team-40035>
- <https://agile.coach/2016/funktionsuebergreifende-komponententeams-gegenueberstellung/>
- <https://www.microtool.de/wissen-online/was-ist-scrum-of-scrums/>
- https://scrum-master.de/Scrum-Glossar/Scrum_of_Scrums

Further Topics

- Contractual aspects: Contract for work vs. service contract, fixed price projects
- Tool support: examples of tools, integration



Further sources:

- https://de.wikipedia.org/wiki/Scrum#Juristische_Erw%C3%A4gungen
- <https://de.wikipedia.org/wiki/Scrum#Werkzeuge>

SCRUM Professional General

- Purpose
 - Deepening knowledge of SCRUM and agility
 - Broadening the horizon beyond the limits of SCRUM
- General
 - Knowledge of SCRUM Foundation is required
 - This Syllabus is part of SCRUM Master and Product Owner
- Time limit
 - 9 x 45 minutes
(6,75 hours)



SCRUM Professional General

- Content
 - Consolidation of SCRUM
 - DevOps
 - Kanban
 - Agile Testing
 - Introduction of SCRUM in the company
 - Scale SCRUM



Distribution of the contents

#	Content / Topic	Percentage
PA1	Consolidation of SCRUM	55%
PA2	DevOps	10%
PA3	Kanban	10%
PA4	Agile Testing	5%
PA5	Introduction of SCRUM in the company	15%
PA6	Scale SCRUM	5%



Consolidation of SCRUM

- Central aspects of SCRUM
- Empirical process control
- backgrounds: Agile values and agile manifesto, agile principles



Further sources:

- <https://de.wikipedia.org/wiki/Scrum>
- <http://agilemanifesto.org/principles.html>
- <https://scrumprep.org/posts/scrum-ist-empirische-prozesssteuerung.html>

DevOps

- Definition and goals of DevOps
- Connection of agile development and parallel operation
- DevOps in practice:
 - Introduction of DevOps
 - Coordination of teams, tools and infrastructure (tool chains)
- Continuous-Deployment, Continuous-Integration & Continuous-Delivery



Further sources:

- <https://de.wikipedia.org/wiki/DevOps>
- <https://de.atlassian.com/devops>
- https://de.wikipedia.org/wiki/Kontinuierliche_Integration
- https://de.wikipedia.org/wiki/Continuous_Delivery
- <https://www.heise.de/developer/artikel/Operations-heute-und-morgen-Teil-1-Das-moderne-IT-Unternehmen-2624295.html>

Ergänzende Literaturhinweise:

- „The DevOPS Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations“ – 2016 von Gene Kim, John Willis, Patrick Debois, Jez Humble
- “Phoenix Project: A Novel about It, Devops, and Helping Your Business Win” – 2018 von Gene Kim

Kanban

- Definition and goals of Kanban
- Background (production process control, value chain)
- Kanban rules (6 principles of Kanban)
- Kanban cards (necessary information & data)
- Kanban boards (visualization, monitoring, transparency)



Further sources:

- <https://de.wikipedia.org/wiki/Kanban>
- <https://de.wikipedia.org/wiki/Kanban-Tafel>
- <https://www.it-agile.de/wissen/einstieg-und-ueberblick/kanban/>

Agile Testing

- Basic principles (fast feedback, high automation, low overheads)
- Role of the tester in the SCRUM project, cooperation with the development
- Testing in a sprint vs. own test teams
- Definition of READY, Definition of DONE, Definition of TEST



Further sources:

- https://de.wikipedia.org/wiki/Agiles_Testen
- <https://www.it-agile.de/wissen/agiles-engineering/agiles-testen/>
- <https://lisacrispin.com/2011/11/08/using-the-agile-testing-quadrants/>

Ergänzende Literaturhinweise:

- “Agile Testing: A Practical Guide for Testers and Agile Teams” – 2008 von Lisa Crispin
- “Agile Testing: Der agile Weg zur Qualität” – 2017 von Manfred Baumgartner, Martin Klonk, Helmut Pichler, Richard Seidl, Siegfried Tanczos

Introduction of SCRUM in the company

- Necessity & motivation for the introduction of SCRUM
- Representation of SCRUM in the company
- Introduction phases (pilot and establishment phase)
- Practices for the introduction of SCRUM
- Problems with the introduction of SCRUM



Further sources:

- <https://www.lead-innovation.com/blog/einf%C3%BChrung-von-scrum>
- https://www.projektmagazin.de/artikel/scrum-im-unternehmen-einfuehren-teil-1_900975

Scale SCRUM

- Frameworks for scaling SCRUM for very large projects (presentation of the frameworks, specific properties, classification, advantages and disadvantages)
 - Large Scale Scrum (LeSS)
 - Nexus
 - Scaled Agile Framework (SAFe)



Further sources:

- <https://less.works>
- <https://www.scrum.org/resources/nexus-guide>
- <https://www.scaledagileframework.com>
- <https://www.ihreveraenderung.de/vergleich-von-skalierten-scrum-frameworks-less-safe-und-scrumscale>

SCRUM Professional SCRUM Master

- Purpose
 - Learning of role-specific characteristics, tasks and activities of the role of the SCRUM Master
- General
 - Knowledge of SCRUM Foundation and SCRUM Professional General is required
- Time limit
 - 9 x 45 minutes
(6,75 hours)



SCRUM Professional SCRUM Master

- Content
 - The ideal SCRUM Master
 - Tasks of the SCRUM Master
 - Coaching and support
 - Continuous improvement
 - Techniques for daily work
 - Evaluate agility



Distribution of the contents

#	Content/Topic	Percentage
SM1	The ideal SCRUM Master	10%
SM2	Tasks of the SCRUM Master	30%
SM3	Coaching and support	20%
SM4	Continuous improvement Kontinuierliche Verbesserung	20%
SM5	Techniques for daily work	10%
SM6	Evaluate agility	10%



The ideal SCRUM Master

- Properties of an ideal SCRUM Master
- "Servant Leadership" as a management style



Further sources:

- https://de.wikipedia.org/wiki/Servant_Leadership
- <https://www.scrum.org/resources/blog/scrum-master-servant-leader>

Tasks of the SCRUM Master

- Interaction between SCRUM Master and SCRUM
 - SCRUM Master and Product Owner
 - SCRUM Master and development team
 - SCRUM Master and Organization
 - SCRUM Master and SCRUM Events
 - SCRUM Master and SCRUM Artifacts



Further sources:

- https://de.wikipedia.org/wiki/Scrum#Scrum_Master
- https://www.it-agile.de/fileadmin/agile_review/einzelartikel/Was_MachtDerScrumMasterDenGanzenTagArtikel/agilereview201501hw.pdf

Coaching and support

- Coaching, support in the development of people
- Conflict Resolution
- Feedback techniques
- Mediation



Further sources:

- <https://www.scrum.de/der-scrum-master-als-coach>
- <https://www.gotscharek-company.com/blog/konfliktmanagement-in-scrum>

Continuous improvement

- Retrospectives
 - 5 phases of a retrospective
 - 4L (Liked, Learned, Lacked, Longed)
 - Tools for retrospectives
- Dealing with interference factors (Impediments Backlog)



Further sources:

- https://de.wikipedia.org/wiki/Scrum#F%C3%BCnf_Phasen_einer_Retrospektive
- <https://www.retrium.com/resources/techniques/4ls>
- <http://www.funretrospectives.com/the-4-ls-liked-learned-lacked-longed-for>
- <http://www.funretrospectives.com>
- https://de.wikipedia.org/wiki/Scrum#Impediment_Backlog
- <https://www.scrum.de/der-scrum-master-als-impediment-beseitiger>

Techniques for daily work

- Moderation techniques
- Meeting rules
- Communication planning and contro



Further sources:

- https://scrum-master.de/Scrum-Meetings/Daily_Scrum_Meeting
- https://www.moderation.com/notizen/28_Agil-Moderieren.pdf
- <https://www.agile-tools.de/die-agilen-formate-mit-how-to-s/basics-meetings-strukturieren/>

Evaluate agility

- Agility Index Measurement
- Self-Assessments
 - Nokia-Test
 - 42-Points List
 - Karlskrona Test



Further sources:

- <https://www.scrum.org/agility-index-snapshot>
- <https://age-of-product.com/measure-agility/>
- <http://jeffsutherland.com/nokiatest.pdf>
- <https://www.101ways.com/how-agile-are-you-take-this-42-point-test>
- <https://mayberg.se/media/downloads/karlskrona-test.pdf>

SCRUM Professional Product Owner

- Purpose
 - Learning of role-specific characteristics, tasks and activities of the role of the Product Owner
- General
 - Knowledge of SCRUM Foundation and SCRUM Professional General is required
- Time limit
 - 9 x 45 minutes
(6,75 hours)



SCRUM Professional Product Owner

- Content
 - The role of the product owner in an agile environment
 - Requirements engineering
 - Identify requirements
 - Document requirements
 - Estimate and prioritize requirements
 - Review and approval of requirements



Distribution of the contents

#	Contetn/ Topics	Percentage
PO1	The role of the product owner in an agile environment	15%
PO2	RE - Identify requirements	10%
PO3	RE - Document requirements	30%
PO4	RE - Estimate and prioritize requirements	40%
PO5	Review and approval of requirements	5%



The role of the product owner in an agile environment

- Tasks of the Product Owner
- Interfaces to development and to the customer



Further sources:

- https://de.wikipedia.org/wiki/Scrum#Product_Owner
- <https://blogs.itemis.com/de/aufgaben-und-verantwortlichkeiten-eines-scrum-product-owners>

Requirements Engineering - Identify requirements

- Requirements, functional / non-functional requirements
- Stakeholders, obligations of stakeholders, stakeholder analysis (stakeholder matrix)
- Overview of types of investigative techniques
 - Survey techniques
 - Creativity techniques
 - Document centered techniques
 - Supporting techniques
- Design Thinking



Further sources:

- <https://de.wikipedia.org/wiki/Anforderung>
- [https://de.wikipedia.org/wiki/Anforderung_\(Informatik\)](https://de.wikipedia.org/wiki/Anforderung_(Informatik))
- <https://de.wikipedia.org/wiki/Scrum#Stakeholder>
- https://de.wikipedia.org/wiki/Design_Thinking
- <https://hpi-academy.de/design-thinking/was-ist-design-thinking.html>

Ergänzender Literaturhinweis:

- „Basiswissen Requirements Engineering: Aus- und Weiterbildung nach IREB-Standard zum Certified Professional for Requirements Engineering Foundation Level“ – 2015 von Klaus Pohl, Chris Rupp

Requirements Engineering - Document requirements

- Product Backlog, PBIs, Minimum and other attributes for PBIs
- Requirement description
 - User Stories
 - Use Case Diagrams, Flow Diagrams, State Diagrams
- Refine requirements
 - Product Backlog Refinement
 - Backlog Grooming
 - Preparations for Sprint Planning
- Quality Gates (3 phases product backlog: demand, requirement and specification)



Further sources:

- https://de.wikipedia.org/wiki/Scrum#User_Story
- <https://de.wikipedia.org/wiki/Anwendungsfall>
- <https://blogs.itemis.com/de/was-sind-gute-user-stories>
- <https://agileforall.com/resources/how-to-split-a-user-story>
- <https://blogs.itemis.com/en/spidr-five-simple-techniques-for-a-perfectly-split-user-story>
- <https://blogs.itemis.com/de/scrum-kompakt-quality-gates-aufgaben-und-die-definition-von-fertig>

Requirements Engineering - Estimate and prioritize requirements

- Estimates in general
 - different methods
 - Estimated sizes (story points, T-shirt sizes)
 - Planning Poker
- errors in estimations (heuristics, cognitive bias, countermeasures)
- Prioritization by benefit, cost and risk/value-risk matrix (Cohn)
- Kano model for benefit assessment
- MoSCoW Prioritization



Further sources:

- <https://de.wikipedia.org/wiki/Scrum#Planungspoker>
- <https://www.mountangoatsoftware.com/uploads/presentations/Agile-Estimating-Norwegian-Developers-Conference-2014.pdf>
- <https://de.wikipedia.org/wiki/Heuristik>
- <https://de.wikipedia.org/wiki/Kano-Modell>
- <https://de.wikipedia.org/wiki/MoSCoW-Priorisierung>

Review and approval of requirements

- Procedure and rules in the Sprint Review



Further sources:

- <https://www.scrum-academy.de/product-owner/wissen/definition-of-done-simpel-und-doch-komplex/>