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| **Timeline** | **Learning Outcomes in Modules** | **Original Capgemini Excel list (area/topic)** | **Additional expectations and**  **comments of Capgemini** |
| Pre-Studies  (July) | (1) Java & object-oriented programming   * Knowledge of the basic concepts of object-oriented programming (using UML) * Use of Eclipse for managing Java projects * Selection of suitable data types, declaration and initialization of variables * Use of operators to create statements, comparisons and assignments * Creating and modifying strings and using them for their intended purpose * Selection and use of sequence instructions to control the program flow * Recognition of scopes and identification of the validity of variables * Understanding and using one-dimensional fields (arrays)   (2) Installation of different tools   * Linux * Eclipse * Docker with Hello World * <https://docker-curriculum.com/#our-first-image>   (3) Practice using the command line  (4) Getting to know Jira, first steps   * Create Jira Account (on Capgemini Test Instance) * Work through given Tutorial   (5) Theory   * What do I understand by the DevOps value chain? * How does an agile team work together in a project? | Programming  General (Runtime Environments) | **Linux will be part of each Module:**  Deep knowledge in Linux installation, administration, usage  **Java:**  Base knowledge about object oriented principles  Setup a new Java project, change code, build and start an application.  **Locale Entwicklungsumgebung:**  Installation of Eclipse  Understanding what an IDE is for and how Eclipse works |
| Week 1 | **Module 1: DevOps Mindset**  As a consultant I can explain basic concepts and a set of best practices of software engineering and DevOps.   * + I know how to run a simple JAVA program and a simple docker container.   + I can explain how development and operations work together. | General  (Software Development)  (Operations)  (Vorgehensmodelle)  (DevOps Approach) | DevOps Approach:  Knowledge what DevOps means and its objective and advantages  Samples how DevOps works in practice  **Operations:**  Awerness what operations means  Understanding what operations manuals and release notes are  typical operations tasks and resposibilities  **Softwareengineering:**  Knowledge of all SE fields/phases from requirement to test and delivery  Usage of Docker Containers (installation, administration)  Overview of different process models (waterfall, v-modell, agile) |
| Week 2 & 3 | **Module 2: Programming & Basics**  As a consultant I understand java programs and can write tests and fix bugs in java code.   * + I can manage my Java Project in Eclipse using maven dependencies, so packages are resolved automatically.   + I can write Unit Tests using JUnit 5 to achieve basic coding quality and maintainability.   + I can persist Entities using Hibernate to connect a JAVA application to a relational database.   + I can use the Debugger to follow a program execution.   As a consultant I can explain git-flow and its main benefits and can use it to share my code with other team members.   * + I can work proficiently with git and git-flow.   + I can manage and automate test cases using Selenium and X-Ray. | Version Control  Programming  Test  (Selenium)  Build Management  (Deployment)  General  (Testmanagement) | **Java:**  Debug a Java application  Usage of third party libraries  **Unit Test:**  Understanding what Unit Tests are for and how they work  Write JUnit tests, execute it locally, analyse results  **Hibernate:**  Understand OR Mapper in priciple  Know the concepts of Hibernate and how it is used  Implementation of a small sample with Hibernate and database connection  **Lokale Entwicklungsumgebung:**  Using Eclipse for Java Development, Unit Tests, Hibernate etc.  Understanding of difference between Eclipse Workspaces / Builds versus Maven  **SonarQube:**  Understand how SonarQube works on server and on client side (Eclipse)  Usage of SonarQube to analyse issues, dashboards etc.  **GIT / GitWorkflows:**  Understanding what Versioncontrol is for, including general concepts like branching, tagging etc.  Installation of GITLab  Creation of GIT Repositories, Groups and Projects in GitLab  Knowledge about difference between centralized and distributed version control  Use of GITLab for version control of source code  Understanding of branching model and Review processes (GitFlow)  Creating branches, tags, merge requests etc.  **Maven:**  Installation of Maven  Understand what Maven is for and how it is used  Implementation of Maven pom structure  Usage of Maven for build, unit test execution, third party dependencies etc.  **Static Code Verification:**  Knowledge what Static Code Verification is, why it is used and how it works  Try out one plugin e.g. Findbugs to analyze Code, check and analyse results, eliminate code problems  Knowledge of tools for Static code verfication like Checkstyle, Sonarqube etc.  **Nexus/Artifactory:**  define local maven repository  Download maven dependency libraries from Nexus  **SQL:**  Basic Knowledge about Ansi SQL, DML, DDL  Using SQL for creation of tables, adding, reading and manipulating data  **Database:**  Base Knowledge what databases are and why we need a database  Knowledge about different Database Types (SQL, NoSQL, …) and Produckts  Knowledge about Data Migration  MySql installation  **Selenium / Testautomation:**  Install Selenium  Understanding how Selenium works and what it is used for  Implementation of Selenium Testcases, execution and result analysis  Knowledge what test automation means and for which kinds of tests is is used  Overview of technologies and tools for test automation |
| Week 4 | **Module 3: Engineering Process & SoftSkills**  I understand common software engineering processes and methodologies and I can explain their basic principles.   * + I can use Jira to manage my issues   + I can use a Kanban board to visualize user stories   + I am able to explain the main differences between conventional project management and common agile practices   + I understand how changes and issues impact software development and can utilize common approaches to include them   + I am aware of basic data privacy regulations and security threats   As a consultant I know about necessary DevOps soft skill sets, can assess my individual level and am able to continuously improve upon them. | General  (Issue-Management)  (Jira)  (Data Privacy)  (Secruity)  (Kanban/Scrum)  (Agile Methoden),  Soft Skills | deeper insight in agile model e.g. scrum  Deeper insight in DevOps topics (collaboration, comunication, automation, agile etc.)  Experiences with sprints, scrum and kanban boards  Grundlagen der kommunikation im Team und gegenüber Kunden sind bekannt und geübt  Grundlagen der Präsentation und Moderation sind bekannt  Kandidaten haben mehrmals etwas Präsentiert und Moderiert  Kandidaten treffen während des Trainings eigenständig Entscheideungen und tragen die Konsequenzen  Averness that DevOps enginners have spcial responsibility (security, avialability of systems, data privacy, …) |
| Week 5 & 6 | **Module 4: Infrastructure as a Code and as a Service**  I know the typical cloud services and their features and can compare cloud services to their on-premise counterparts.   * + I have theoretical background for container platforms.   + I can use terraform to create local servers via docker.   + I can deploy a Jenkins server on a Linux VM using ssh.   + I can deploy a Jenkins server on a Linux VM using ansible. | Runtime Environments  Build Management  Deployment | **Jenkins:**  Installation of Jenkins and Plugins  Knowledge of plugin concept and most popular plugins  Installation of SonarQube  Installation of Nexus  **Infrastructure as Code:**  Understand what infrastructure as code means and how it can be implemented  Knowledge about Infra as code on premise and in a cloud  **Hypervisor:**  Base knowledge about virtualization software, Hypervisor and VMWare  **Docker:**  Knowledge about Container Technology in general  Docker Monitoring basics  **Container Platforms:**  Knowledge what Container Platforms are and why they should be used  Overview of typical platform tools  **Cloud IaaS and PaaS:**  Deeper knowledge about IaaS and PaaS  Base knowledge what a cloud is and which cloud providers are important  Base knowledge about most common cloud services  **Webserver:**  Understanding what web servers are and why we need it  Knowledge about most important Web Server Products  Knowledge what proxies and load balancing are  Apache Installation  Apache configuration -> access Tomcat App |
| Week 7 & 8 | **Module 5: Deployment and Delivery**  As a consultant I understand common software engineering processes and methodologies and I can explain their basic principles.   * + I can write and configure a spring boot application using common spring boot mechanisms   + I can pack a deliverable artifact with documentation.   As a consultant I can deploy an application using scripts (without utilizing pipelines).   * + I can install and start a tomcat server using docker.   + I can deploy a tomcat server on a Linux VM using ssh, ansible.   + I can deploy a java war file to tomcat using ansible.   + I can deploy a java docker image to the docker runtime. | Programming  Build Management  Deployment  Runtime Environments | **Spring Boot:**  Understand what Spring Boot is for and how it is used in an application  **CI Pipelines:**  Impelementation of a Build Process with Maven -> war file -> docker container  **Nexus/Artifactory:**  Knowledge what Nexus and Artifactory are used for  Different kinds of Repositories  Upload a build artifact into Nexus  **CD Pipelines:**  Understand difference between Snaphot and fixed versions of artifacts  Knowledge about standard deployment pipelines  implementation of deployment pipelines for an Java application with apache, tomcat and a database  implementation of a deployment pipeline for an java application in a docker container  **Ansible:**  Understanding of what Ansible is for and how it works in general  Implementation of Ansible Roles and Playbooks for deployment of apache, tomcat, database, application  Understanding difference between deployment automation code and environment specific confuguration (Inventory, property files etc.  **Application Server:**  Understanding what application servers are and why we need it  Knowledge about most important Application Server Products  Tomcat Installation  Deployment of war file on Tomcat  Configuration of Datasoure in Tomcat |
| Week 9 | **Module 7: Continuous Integration**  As a consultant I know typical steps of Continuous Integration (CI) and can create pipelines.   * + I can create a hello World Jenkins file and a CI Pipeline.   + I can set up a Webhook to Jenkins.   + I can validate code quality with SonarQube. | Build Management  Deployment | **CI Pipelines:**  Understand concept and need for Continuous Pipelines  Understanding of difference between Continuous Intgeration, -Deployment, -Delivery Pielines  Knowledge about separation of workflow and pipeline step implementation  Knowledge about standard build pipelines  Design of a detailed build pipeline with different steps  **Jenkins & Jenkins Pipelines:**  Deep knowledge how Jenkins works and how to use it  Use of Jenkins for execution of pipelines and workflows  Usage of Shared Libraries for Pipelines  Implementation of Build and Deployment Pipeline Jobs in Jenkins  Structuring Jenkins GUI with Folders etc.  Implementation of Jenkins Jobs  Understanding Jenkins pipelines concept including parallelization  Implementation of Jenkins pipelines  using blue ocean  **Groovy:**  Implementation of shared libraries and pipelines for Jenkins |
| Week 10 | **Module 8: Continuous Deployment**  As a consultant I know typical steps of Continuous Deployment (CD) and can detect simple errors.   * + I understand error messages in Jenkins or application logs and can fix the errors.   + I can deploy using a Jenkins file.   + I can inspect log files of my application.   + I can deploy my application to an existing logging stack using the sidecar pattern.   + I can monitor api health and ready metrics using Prometheus and Grafana.   + I can monitor CPU and memory usage. | Build Management  Deployment  Runtime Environments | **Jenkins:**  Usage of Jenkins Jobs - execution, result and error analysis  **Monitoring / Logging:**  Understanding what monitoring and logging are and why we need it  Knowledge about different Products for Monitoring and for Logging  Different kinds of Monitoring (infrastructure-, application-, process-monitoring)  Installation of a logging tool and connection to application on tomcat and Apache |
| Week 11 & 12 | **Finale Project** |  |  |

**Original Capgemini Excel list**

Basic: Wendet theoretisch fundiertes Wissen an, um klar definierter Aufgabenstellungen überwiegend unter Anleitung zu erledigen.

Experience: Wendet fundiertes Wissen an, um Lösungen weitestgehend selbsständig zu erarbeiten und Aufgabenstellungen eigenständig zu erledigen.

**Professional:** Wendet fundiertes Wissen und Praxiserfahrung an, um eigenständig Geschäftsprozesse und Lösungen umzusetzen

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| Area | Topic | Knowledge | | | Academy Modules |
| Basic | Experienced | Professional |
| Programming | Java |  | x |  | Pre, 1, 2, 6 |
| Spring Boot |  | x |  | 6 |
| Unit Test |  | x |  | 2 |
| Hibernate |  | x |  | 2 |
| Lokale Entwicklungsumgebung |  | x |  | All |
| Versioncontrol | GIT |  | x |  | 2+ |
| GIT Workflows |  | x |  | 2+ |
| Buildmanagement | CI Pipelines |  | x |  | 7 |
| Maven |  | x |  | 2, 6 |
| Jenkins |  |  | x | 4, 5, 7, 8 |
| Static Code Verification | x |  |  | 2, 7 |
| SonarQube | x |  |  | 7 |
| Nexus / Artifactory | x |  |  | 4 |
| Deployment | CD Pipelines |  | x |  | 8 |
| Jenkins Pipelines |  | x |  | 7, 8 |
| Groovy |  | x |  | 7 |
| Ansible |  | x |  | 4, 6 |
| SQL | x |  |  | 2 |
| Infrastructure as Code | x |  |  | 4, 6 |
| Test | Testautomation | x |  |  | 2, 5 |
| Selenium | x |  |  | 2, 5 |
| Runtime Environments | Hypervisor (e.g. VMWare) | x |  |  | 4 |
| Linux |  |  | x | 6 |
| Docker |  | x |  | All |
| Container Platforms (Kubernetes or OpenShift) | x |  |  | 4 |
| Cloud IaaS and PaaS (AWS or Azure) | x |  |  | 4 |
| Database (e.g. Oracle) | x |  |  |  |
| Application Server (e.g. Tomcat) |  | x |  | 4, 6, 8 |
| Webserver (e.g. Apache/Nginx) |  | x |  | 4, 6, 8 |
| Monitoring / Logging |  | x |  | 8 |
| General | Softwareengineering |  | x |  | 1 |
| DevOps Approach | x |  |  | 1 |
| Vorgehensmodelle | x |  |  | 1, 3 |
| Operations | x |  |  | 1 |
| Soft Skills | Siehe DAF für Applications Consultant |  | x |  | 5, All |
| Verantwortungsbewußtsein |  | x |  | 5, All |
| Vertrauenswürdigkeit |  | x |  | 5, All |