**Ashoka University**

**Computer Science Department**

**Advanced Programming (Monsoon 2017)**

**Brief Description**: Skills and knowledge required for professional programming and development. Problem and system decomposition and integration. Co-operative programming. Source code and version control system. Issue tracking system. Build automation. Automated testing and test driven development. Source tree and code organization. Code readability. Defensive coding and error handling. Performance optimization and tuning. Integrated Development Environments (IDEs), Application Programming Interfaces (APIs) and Frameworks. Scripting. Programming of large scale systems. Systematic debugging. Fundamentals of writing clean code.

**Pre-requisite:** A course on Introduction to Programming

**Instructor**: Dr. Ashish Sureka (Email: [ashish.sureka@ashoka.edu.in](mailto:ashish.sureka@ashoka.edu.in) Home-Page: [www.ashish-sureka.in](http://www.ashish-sureka.in))

**Learning Objectives:**

* Knowledge and hands-on experience with software engineering tools such as IDE, version control systems and issue tracking systems
* Ability to JUnit test cases for test driven development
* Knowledge of Defensive coding and error handling.
* Ability to troubleshoot and diagnose performance related problems and perform code optimization and tuning.
* Ability to create and use Application Programming Interfaces (APIs) and Frameworks.
* Acquire hands-on experience with systematic debugging
* Fundamental concepts for building large scale systems

**Class Timings and Venue**: Monday and Wednesday (2:50 PM – 4:20 PM) AC LR 010

**Text Books**

1. Agile Software Development, Principles, Patterns, and Practices by Robert C. Martin
2. Clean Code: A Handbook of Agile Software Craftsmanship by Robert C. Martin
3. Code Complete by Steve McConnell

**Grading Policy**

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| **Summative Assessment** | | | | |
|  | **Exam** | **Duration** | **Syllabus** | **Weightage** |
| 1 | Mid Term Exam | 75 Minutes | 1-12 Classes | 25% |
| 2 | Final Exam | 75 Minutes | 13-24 Classes | 25% |
| **Formative Assessment** | | | | |
|  | **Exam** | **Duration** | **Syllabus** | **Weightage** |
| 3 | Quiz 1 | 45 Minutes | 1-7 Classes | 10% |
| 4 | Quiz 2 | 45 Minutes | 13-19 Classes | 10% |
| **Hands-On Project Based Assessment (3 Member Team Based)** | | | | |
|  | **Project** | **Demo and Presentation** | | **Weightage** |
| 5 | Part 1 (50% Complete) | 45 Minutes | After Mid-Term Exam | 15% |
| 6 | Part 2 (100% Complete) | 45 Minutes | After Final Exam | 15% |