ISS NICF COURSES: SOFTWARE ENGINEERING & DESIGN

Providing advanced and continuing education and applied research in software engineering, design and development, linking academic theory to industry practice, and ensuring value for all stakeholders

- NICF - Agile Continuous Delivery
- NICF - Architecting Software Solutions
- NICF - Building Enterprise Architecture Using Java EE
- NICF - Cloud Economics & Technology for Practitioners
- NICF - Design and Develop Mobile Enterprise Application with HTML5
- NICF - Essential Practices for Agile Teams
- Evaluating Software Architectures
- NICF - Object Oriented Analysis & Design
- NICF - Object Oriented Design Patterns
- NICF - Service Oriented Architecture Essentials
- NICF - Software Testing

Designed for:
- Project Managers/Application Development Managers
- Application/Solution Architects
- Systems Analysts/Software Engineers
- Test Engineers/Test Specialists
- Release/Configuration Managers

www.iss.nus.edu.sg
The Software Engineering & Design (SED) Practice at the Institute of Systems Science (ISS) focuses on a wide range of core courses to build the competency of IT Professionals. We are an accomplished training institution for Java technology and the first to develop Java courses in Singapore.

The SED team at ISS offers a comprehensive suite of training and consulting services to help software professionals harness the immense potential of Agile software development, and other traditional methods. Keeping in line with Infocomm Development Authority of Singapore’s (IDA) key focus areas, we offer state of the art courses in Agile Software Development and Cloud Computing.

The motto of SED practice is to be thought leaders in bringing up to date education in software engineering practices, software frameworks and technology to software professionals. With our constant software technology scans, research and constant upgrading of skills set, we keep abreast with the latest in these areas. Our workshop-based courses, ranging from programming to designing to architecting applications, are taught by highly experienced instructors.

**CORPORATE CLIENTS**
Over the years, some of the clients whom we have worked with include:

- Central Provident Fund Board
- Defence Science & Technology Agency
- ST Electronics (Info-Software Systems)
- DSO National Laboratories
- Inland Revenue Authority of Singapore
- Housing & Development Board
- Singapore Telecommunications Pte Ltd
- Yokogawa Electric International Pte Ltd
- NCS Pte Ltd
- Gemalto Pte Ltd
- CrimsonLogic Pte Ltd

**ISS SED TRAINING ROADMAP**

<table>
<thead>
<tr>
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<tbody>
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**NICE COURSES**

**NICE - Agile Continuous Delivery**
Learn about Agile Continuous Delivery concepts, and also how it can be effectively applied to various projects to produce better cost, schedule and defect control.

**NICE - Architecting Software Solutions**
Learn about architectural concepts for the enterprise applications and understand how to build robust, secure and maintainable architectures.

**NICE - Building Enterprise Applications Using Java EE**
Learn about best practices, proven design patterns in popular code frameworks, design engineering practices and technology to software professionals. With our understanding of implementation experiences in building maintainable and architecturally sound enterprise applications.

**NICE - Cloud Economics and Technology for Practitioners**
Learn technical and business expertise in cloud service platforms. Gain a solid understanding of cloud computing technology and service models, as well as the business models of popular platforms such as Amazon and Google.

**NICE - Essential Practices for Agile Teams (Certified Scrum Developer Technical Track)**
An in-depth technical training for various agile engineering practices to allow the team to be more adaptive to changes in business requirement.

**NICE - Object Oriented Analysis & Design (ODAO)**
Learn how the OOAD techniques can be applied to analyse user requirements and produce quality system design.

**NICE - Object Oriented Design Patterns (ODDP)**
Learn how to solve tough design problems by adapting proven design called design patterns. By using proven solutions on the right problems in the right contexts, you will be able to design maintainable and extensible software.

**NICE - Service Oriented Architecture (SOA) Essentials**
Equip yourself with broad knowledge on SOA to apply the principles, techniques and practices of software testing.

**NICE - Software Testing**
Learn how to improve software quality and apply the principles, techniques and practices of software testing.

**Terms and conditions apply. Visit [www.wda.gov.sg](http://www.wda.gov.sg) for full details.**

Institute of Systems Science (ISS) works closely with IDA and Singapore Workforce Development Agency (WDA) to align our Software Engineering & Design practice’s training curriculum to the National Infocomm Competency Framework (NICF), so as to equip attendees with a practical and interactive learning experience and the relevant knowledge, skills and tools.

Through a combination of lectures and scenario-based workshops, you will learn Software Engineering & Design practice’s principles and practices to make your organisation and the software industry more productive and sustainable. By attending these courses, you will be equipped with the required skills in building robust and secure enterprise applications with maintainable architectures.

**KEY TAKEAWAYS**

**NICE - Agile Continuous Delivery**
- Understand the need for Continuous Integration (CI) and build a CI system
- Appreciate different agile continuous delivery concepts
- Understand and practice CI methods & automated delivery
- Perform continuous delivery using an automated continuous integration approach

**NICE - Architecting Software Solutions**
- Design the architecture with emphasis on the software quality attributes and their tradeoffs
- Design common application integration components
- Perform threat modeling to identify the threats, vulnerabilities and recommend appropriate controls
- Undertake capacity planning

**NICE - Building Enterprise Applications Using Java EE**
- Build web applications using web components such as Servlets, JavaServer Faces, AJAX and Primetime
- Design extensible Java EE applications by leveraging on dependency injection techniques
- Create reusable business objects
- Build effective and robust data persistence with Java Persistence API and object relational mapping
- Apply important Java EE design patterns and best practices to improve the robustness and maintainability of web applications

**NICE - Cloud Economics and Technology for Practitioners**
- Make appropriate business cases for cloud paradigm
- Understand architecture and service models
- Evaluate scope and control between the cloud service provider and consumer
- Understand the need for Continuous Integration (CI) and build a CI system
- Design and architecture and design practices in agile software development

**NICE - Essential Practices for Agile Teams (Certified Scrum Developer Technical Track)**
- Appreciate different agile software development methodologies
- Understand and practice pair programming, Test Driven Development and refactoring
- Apply architecture and design practices in agile software development

**NICE - Object Oriented Analysis & Design (ODAO)**
- Understand OOAD Principles
- Understand UML notations and diagramming techniques
- Apply OOAD techniques in development processes

**NICE - Object Oriented Design Patterns (ODDP)**
- Understand the “Gang of Four” design patterns
- Understand and apply principles of good object oriented design
- Design systems by reusing design patterns
- Have hands-on experience in implementing and incorporating patterns in software programmes
- Improve code and design by refactoring to design patterns

**NICE - Service Oriented Architecture (SOA) Essentials**
- Learn the definitions and principles relating to SOA
- Understand the rationale and benefits of SOA
- Understand business driven development
- Evaluate SOA methodology
- Perform SOA planning and governance
- Apply the SOA ROI model

**NICE - Software Testing**
- Prepare the software test estimation, test planning, test progress monitor and control report
- Apply the software test automation techniques and tools
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| **Software Evaluation** | | |
| NIFC – Cloud Economics and Technology for Practitioners (3 days) | Evaluating Software Architecture (2 days) |

The courses above are aligned to the National Infocomm Competency Framework (NICF) and accredited by WDA. Up to 70% WDA funding of the course fee is available for eligible Singapore Citizens and Permanent Residents.

Institute of Systems Science (ISS) works closely with IDA and Singapore Workforce Development Agency (WDA) to align our Software Engineering & Design practice’s training curriculum to the National Infocomm Competency Framework (NICF), so as to equip attendees with a practical and interactive learning experience and the relevant knowledge, skills and tools.

Through a combination of lectures and scenario-based workshops, you will learn Software Engineering & Design practice’s principles and practices to make your organisation and the software industry more productive and sustainable. By attending these courses, you will be equipped with the required skills in building robust and secure enterprise applications with maintainable architectures.

NIFC COURSES | COURSE INTENT | KEY TAKEAWAYS
--- | --- | ---
**NIFC – Agile Continuous Delivery** | Learn Agile Continuous Delivery concepts, and also how it can be effectively applied to various projects to produce better, cost effective, schedule and defect control. | • Understand the need for Continuous Integration (CI) and build a CI system • Appreciate different agile continuous delivery concepts • Understand and practice CI methods & automated delivery • Perform continuous delivery using an automated continuous integration approach
**NIFC – Architecting Software Solutions** | Learn about architectural concepts for enterprise applications and understand how to build robust, secure and maintainable architectures. | • Design the architecture with emphasis on the software quality attributes and their trade-offs • Design common application integration components • Perform threat modeling to identify the threats, vulnerabilities and recommend appropriate controls • Undertake capacity planning
**NIFC – Building Enterprise Applications Using Java EE** | Learn about best practices, proven design patterns, popular web frameworks, design principles and implementation strategies. Gain an understanding of the implementation experience in building maintainable and architecturally sound enterprise applications. | • Build web applications using web components such as Servlets, JavaServer Pages, JSPs, JAXM and Primetools • Design extensible Java EE applications by leveraging on dependency injection techniques • Create reusable business objects • Build effective and robust data persistence with Java Persistence API and object relational mapping • Apply important Java EE design patterns and best practices to improve the robustness and maintainability of web applications
**NIFC – Cloud Economics and Technology for Practitioners** | Learn technical and business expertise in cloud service platforms. Gain a solid understanding of cloud computing technology and service models related to the benefits of popular platforms such as Amazon and Google. | • Make appropriate business cases for cloud paradigm • Understand architecture and service models • Evaluate scope and control between the cloud service provider and consumer • Identify and apply suitable application migration strategies • Work in a real-case scenario to study suitable migration strategies and practices
**NIFC – Essential Practices for Agile Teams (Certified Scrum Developer Technical Track)** | An in-depth technical training for various agile engineering practices to allow the team to be more adaptive to changes in business requirements. | • Appreciate different agile software development methodologies • Understand and practice pair programming, Test Driven Development and refactoring • Apply architecture and design practices in agile software development
**Evaluating Software Architectures** | Understand the architectural concepts with emphasis on evaluating the qualities of the software architectures, through lectures and scenario-based workshops. | • Examine the application’s software requirements to define objectives, review items and acceptance criteria for validation and verification • Identify the relevant standards and guidelines applicable to the review of items • Perform review of detailed design against the acceptance criteria and checklists • Identify non-compliance based on review outcomes and proposed actions to be taken
**NIFC – Object Oriented Analysis & Design (OOA&DI)** | Learn how the OOAD techniques can be applied to analyse user requirements and produce quality system design. | • Understand OOAD Principles • Understand UML notations and diagramming techniques • Apply OOAD techniques in development processes
**NIFC – Object Oriented Design Patterns (OODP)** | Learn how to solve tough design problems by adapting proven design called design patterns. By reusing proven solutions on the right problems in the right contexts, you will be able to design maintainable and extensible software. | • Understand the “Gang of Four” design patterns • Understand and apply principles of good object oriented design • Design objects by reusing design patterns • Have hands-on experience in implementing and incorporating patterns in software programmes • Improve code design by refactoring to design patterns
**NIFC – Service Oriented Architecture (SOA) Essentials** | Equip yourself with broad knowledge on SOA to actively participate, evaluate and plan for SOA projects in your organisation. Understand the architecture and learn how to better integrate existing applications with business partners. | • Learn the definitions and principles relating to SOA • Understand the rationale and benefits of SOA • Understand business driven development • Evaluate SOA methodology • Perform SOA planning and governance • Apply the SOA KDD model
**NIFC – Software Testing** | Learn how to improve software quality and apply the principles, techniques and practice of software testing. | • Prepare the software test estimation, test planning, test progress monitor and control report • Apply the software test automation techniques and tools

The courses above are aligned to the National Infocomm Competency Framework (NICF) and accredited by WDA. Up to 70% WDA funding of the course fee is available for eligible participants (Singapore Citizens and Permanent Residents). Up to 90% WDA funding is available for company-sponsored participants (Singapore Citizens and Permanent Residents) of Small and Medium Enterprise (SMEs) via the Enhanced Training Support for SMEs scheme. Absentee pay-out is not applicable for all employee-sponsored participants. Terms and conditions apply. Visit www.wda.gov.sg for full details.
"From the course, I understood the latest technologies and how they are applicable to my company's software system through hands-on exercises."

Irving Lee, Software Development Engineer, DNR Process Solutions Pte Ltd (Design and Develop Mobile Enterprise Application with HTML5, Class of Mar 2015)

"The knowledge and skills learnt from the course made it easy to create applications, especially for someone who only uses C++!"

Ong Wilson, Software Engineer, Gemalto Pte Ltd (Building Enterprise Applications Using Java EE, Class of Apr 2015)

"The workshops were good in reinforcing concepts without being too tedious."

Joshua Siao, Software Engineer, DSO National Laboratories (Object Oriented Analysis and Design, Class of Jan 2015)

**ISS – Your Choice Training Partner**

With over 30 years of experience in education, consulting and research, Institute of Systems Science (ISS) at the National University of Singapore offers a suite of high quality, blended learning courses. Training at ISS is delivered by industry professionals with successful track records and an average of more than 10 years of industry experience.

ISS is an appointed Continuing Education and Training (CET) Centre for National Infocomm Competency Framework (NICF). Some of the NICF courses are in the areas of Analytics & Intelligent Systems, Business Analysis, IT Planning & Enterprise Architecture and Software Engineering & Design. ISS is also a Programme Partner to WDA’s Service Excellence Competency and Creative Industries Framework to deliver Service Innovation and Design Thinking courses.

To date, over 96,000 infocomm professionals, 5,200 corporate customers and 4,600 graduate alumni members have benefitted from ISS’ suite of services. We are happy to conduct our courses in-house at your organisation. The same NICF funding applies. Email isstraining@nus.edu.sg to find out more today.

**ISS Executive Education Programmes**

- Agile
- Analytics & Intelligent Systems
- Business Analysis
- IT Governance & Risk Management
- IT Planning & Enterprise Architecture
- IT Service Management
- Leadership
- Project Management
- Service Innovation & Design
- Software Engineering & Design

**INSTITUTE OF SYSTEMS SCIENCE** National University of Singapore

25 Heng Mui Keng Terrace Singapore 119615  Tel: (65) 6516-2093  Email: isstraining@nus.edu.sg  facebook.com/iss.nus  twitter.com/issnus