

(Draft for Discussion - November 2013)

Certificate for Information Technology Officials (CITO)

Online Education based on Hands-On Workshops

The Certificate for IT Officials (ITOs) is being offered to specifically address the unique challenges of the underserved segments of our society (i.e., the developing countries and the “have nots” in the developed countries). This Program will enable current and aspiring ITOs (e.g., CIOs, directors, project managers, development managers, IT planners, enterprise architects, systems analysts, and business analysts) to develop the skills and knowledge needed to manage the demands of their complex roles. The student can also optionally earn recognized credentials (e.g., an MS degree from a recognized university).

Unique Features of the Program

- Based on the United Nations eNabler Project that is addressing the major challenges faced by the developing countries and other underserved segments (e.g., IT project failure rates of around 85%, and lack of educational and financial resources).
- Instead of the typical lecture model, relies heavily on hands-on experiments with a computer aided environment for ITOs, called SPACE, that has been developed to address the aforementioned challenges.
- Emphasis is on how to do more with less by using the best practices and tools throughout the Learn-Plan-Do-Check cycle.
- Heavily relies on real life case studies and examples to assure mastery of ITO skills in addressing practical problems. The case studies are based on real life situations from different countries for global insights.
- Most of the learning comes from hands-on experiments with business games, simulations, decision support tools, and an extensive ePlanner – all part of the SPACE environment.
- Each course requires one project that the attendee first solves by hand, then through the SPACE environment, and finally a self-assessment for practical insights.
- All attendees will collaborate with each other through a social network for an enriching experience.

Program Highlights

- The CITO Program consists of three courses (C1, C2, C3), displayed in “Contents” and explained in sections 2, 3 and 4 of this document.
- The courses are priced for developing countries and the student can get academic credit from an accredited university (e.g., Harrisburg University -- HU). These courses can also be used towards an MS degree from HU (see sections 5 and 6 for details).
- SPACE (Strategic Planning, Architectures, Controls & Education) environment will be made available to all students for hands-on learning plus real problem solutions (see Section 7 for details on SPACE).

Contents

1. CITO Program Overview
2. Course C1: Strategic Planning, Architecture and Management for eGovernment and eBusiness
3. Course C2: Enterprise Architecture and Integration for eGovernment and eBusiness
4. Course C3: Governance, Project Management and Security in the Digital Age
5. Administrative Information
6. Master’s Degree in Information Systems Engineering and Management (ISEM)
7. Online Resources provided by SPACE for Hands-on Experiments and Problem Solving

For Additional Information: Please send an email to cito@ngesolutions.com

1. CITO Program Overview

This Online Program is intended to educate IT Officials (ITOs) in the public as well as private sectors especially in the underserved segments. The Program consists of a series of short online courses that emphasize the use of emerging technologies in eGovernment and eBusiness. Comprehensive online resources will be used for hands-on experiments and investigations. The attendees will be able to lead the eGovernment and eBusiness initiatives by using the extensive resources provided by the Online Program.

Key Features of the Program:

- All courses are offered completely online. In-Class and Hybrid delivery methods will be made available on demand.
- The CITO Program consists of three courses (C1, C2, C3) and each course consist of five one day (6 hour) modules.
- Each course (40 hours of instruction) must be completed within four months after enrollment.
- Each course requires approximately 1 hour of offline work for each one hour of instruction.
- We are initially offering three courses (C1, C2, C3). More courses will be added gradually to cover the entire curriculum for MS in ISEM from HU.

- The other two courses (C2 and C3) concentrate on vertical layers that cut across all horizontal layers. C2 concentrates on the very important area of enterprise architectures and integration issues at global levels. C3 covers the governance, project management and security aspects of eBusiness and eGovernment.

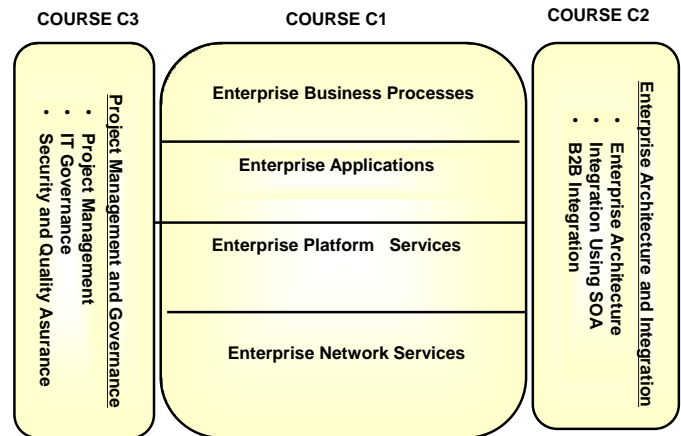
Overview of the Program Curriculum

The following framework illustrates the key building blocks of the certified ITO program.

- Core IT service functions, such as business processes, applications, and computing-communication platforms represent the basic building blocks of modern enterprises and are shown as horizontal organizational layers.
- Interdisciplinary, cross-cutting management practices and governance activities such as communications, planning, management, and security enable and support the horizontal layers (IT service functions) and are emphasized in the CITO program.

The curriculum addresses this framework by using examples, case studies, and best practices.

- The first course (C1) sets the context by introducing the program and providing an overview of the entire framework using examples of eGovernment and eBusiness from around the globe. It primarily concentrates on the horizontal layers (IT service functions).



The Vision

CITO Program has been prepared by the NGE Solutions Team in collaboration with Harrisburg University of Science and Technology (HU) and UN-GAID¹. We share a common vision – bridge the digital divide through education and technology. Collaborations with other academic institutions, international organizations, government agencies, NGOs and private industries are being explored.

¹ NGE Solutions is a startup that has developed the SPACE Environment—a spinoff of the UN eNabler Project. Harrisburg University is a “startup” university that is focusing on STEM (Science, Technology, Engineering and Mathematics) for the underserved sectors. UN-GAID (Global Alliance for ICT Development) is a UN initiative focusing on ICT for developing countries and has launched the UN-eNabler Project.

2. Course C1: Strategic Planning, Architectures and Management Practices in the Digital Age

This extensive course will show how to strategically plan, architect and administer the complex information systems that support and drive the current and future digital enterprises. The first part of the course will review the emerging features of current and future enterprises (e.g., service orientation, reliance on web and mobile services, globalization, and agility). The second part will explicate the role of IT to enable and drive such enterprises and will explain the building blocks of the modern information systems that span business processes, enterprise applications, databases, computing platforms, and network services. The final segment explores how the needed IT systems can be planned, engineered/re-engineered, integrated, secured and managed by using the systems engineering principles. Extensive case studies and hands-on experiments will be used throughout the course.

Prerequisite: Basic background in ICT or permission of the instructor

Learning Objectives of Course:

After this course, the students should be able to:

- Develop strategic IS plans that are based on people, processes and technologies)
- Identify the layers (building blocks) that form the modern enterprises and understand the role of IT to enable modern enterprises
- Understand the fundamentals of business process analysis and how the enterprise applications support the business processes
- Apply the basic concepts of knowledge management and AI to business decisions in global enterprises
- Lead the planning initiatives by using the extensive array of resources provided by the Online Program

About Hands On Experiments

- Most of the learning comes from extensive projects that require hands-on experiments, simulations and self-assessments.
- The attendees will first develop, by hand, a strategic plan and an enterprise architecture of a company of their choice.
- They will then redevelop the plan and architecture by using the SPACE computer aided environment and do self-assessment through extensive hands-on experiments.
- All attendees will collaborate with each other through a social network for an enriching experience.
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Course C1 Outline

C1M1: Executive Summary: Strategic Planning, Architecture and Management in The Digital Age

- Global eBusiness and eGovernment
- Strategic Planning: Preparing for the Next Generation Enterprises

C1M2: Business Strategies and Management

- Business Strategy and Organizational Management
- Competitive Models (e.g., Porter)
- Cost-Benefit and SWOT Analysis

C1M3: Applications in eBusiness, eCommerce and eGovernment

- Business Processes and Enterprise Resource Planning (ERP) Applications
- Decision Support and Expert Support Systems

C1M4: Emerging Technologies: Platforms, Databases and Networks

- Platform and Database Systems
- Internet and Web Technologies
- Mobile Computing and Wireless Systems

C1M5: Architecture and Planning

- Enterprise Architectures
- Enterprise and Inter-enterprise Planning

3. Course C2: Enterprise Architecture and Integration Practices in the Digital Age

Modern digital enterprises are characterized by increased automation, mobile services, extended B2B operations with global business partners, and on-demand business services. The main issue in such enterprises is to architect and integrate a very wide range of services quickly and effectively. This course presents a ‘systems’ perspective based on service oriented architecture (SOA) that combines processes, people and technologies and highlights the role of information and communication technologies, enterprise models, and emerging SOA standards in developing flexible and integrated business architectures. Within the conceptual framework, the topics continually evolve as new technologies, techniques, methodologies and standards emerge.

Prerequisite: Course C1 or permission of the instructor

Learning Objectives:

After this course, the student should be able to:

- Develop architectures for globally integrated enterprises with business as well as technical details
- Effectively use the concepts of architecture frameworks, business process modeling and reengineering in enterprise integration projects
- Develop enterprise and B2B integration strategies using SOA
- Understand the role of SOA, Classical Web, the Semantic Web, XML technologies and Web 2.0 in enterprise integration
- Lead the integrated architecture initiatives by using the extensive array of resources provided by the Online Program.

About Hands On Experiments

- Most of the learning comes from extensive projects that require hands-on experiments, simulations and self-assessments.
- The attendees will first develop, by hand, an integrated enterprise architecture of a company of their choice.
- They will then redevelop the integrated enterprise architecture by using the SPACE computer aided environment and do self-assessment through hands-on experiments.
- All attendees will collaborate with each other through a social network for an enriching experience.

Course Outline

C2M1: Executive Summary: Enterprise Architecture and Integration

- EA (Enterprise Architecture) Principles
- Common Frameworks (TOGAF)
- Integrated Architectures and SOA

C2M2: Business and Application Architectures in eBusiness, eCommerce and eGovernment

- Business Architectures
- Application Architectures
- Examples and Case Studies

C2M3: Web Technologies and SOA

- Semantic Web and XML
- Service Oriented Architectures (SOA)
- Examples and Case Studies

C2M4: Enterprise/Inter-enterprise Integration

- EA and Integration B2B Integration
- B2B and Interagency Integration
- Overview of eNabling Technologies
- Examples and Case Studies

C2M5: Management & Governance Issues

- PMI Integration Processes
- SOA Governance – Best Practices
- Examples and Case Studies

4. Course C3: Governance, Project Management and Security Practices in the Digital Age

Project management, governance and security management are key to the success of any initiative in the public or private sector. The first part of this course presents the fundamentals of governance with focus on IT governance and how it is being used in the public as well as private sector. The second part concentrates on project management and the best practices in project management as specified by the Project Management Institute. The last part covers the essentials of security management and quality assurance for managers. Topics include risk analysis, security policies, main security technologies, and security audits. Instead of one narrow aspect of management, this course emphasizes the strategies and best practices needed to manage, secure and control the IT initiatives at a global level.

Prerequisite: Course C1 or permission of the instructor

Learning Objectives:

After this course, the student should be able to:

- Fully understand the role of management in successful initiatives
- Apply the concepts of IT governance in the public as well as private sectors
- Learn the best practices in project management for successful projects
- Develop security management policies and procedures for projects
- Establish quality assurance guidelines and controls for projects
- Apply the strategies and best practices needed to manage global projects

About Hands On Experiments:

- Most of the learning comes from extensive hands-on simulations in project management, governance and security.
- The attendees will first develop, by hand, a management strategy for an initiative and then redevelop the strategy by using the SPACE computer aided environment
- The students will also engage in self-assessment through hands-on experiments.
- All attendees will collaborate with each other through a social network for an enriching experience

Course Outline

C3M1: Executive Summary: Project Management and Governance

- The Roles of Governance and Project Management in Modern Organizations

C3M2: Governance

- IT Governance versus Enterprise Governance
- IT Governance Frameworks
- Examples and Case Studies

C3M3: Project Management

- The PMI Framework
- Tools for Project Management
- Examples and Case Studies

C3M4: Security Management

- Security and Privacy Principles
- Key Security Technologies
- Security Policies and Risk Analysis
- Examples and Case Studies

C3M5: Quality Assurance Issues

- Quality Assurance Principles
- IT Audits for Quality Assurance
- Quality Assurance Frameworks
- Examples and Case Studies

5. Administrative Information

This Certification for IT Officials (CITO) is being offered to specifically address the unique challenges of public and private sector IT executives.

Format of the Course:

- **Grading:** Pass-fail assessment, which is based on attendance, class contributions and the final project, increases participant accountability and learning outcomes.
- **Academic Credit:** The student may get academic graduate credit from Harrisburg University (HU) for a Course (C1, C2, or C3) by taking an HU Directed Studies Course which will build upon the a CITO Course through additional research/applied projects. This will require additional fees (we are working through the details).
- **Qualifications for CITO Program:** Candidates should possess the following criteria to be accepted into the program: (1) applicants work for the public or private sector, preferably in a developing country. However, applicants from “underserved” segments (e.g., small to medium businesses, local government or NGOs) from developed countries may also apply (2) they must have a minimum of 2 years of work experience in information technology (3) candidates must have a Bachelor’s degree with courses in information technology. Other candidates with exceptional academic and industrial experience will be considered.
- **Students with Insufficient IT Background:** An intensive hands-on “bridge” course on IT Principles is offered to bridge the gap (see the Course C0 in next column for details).

exceptional academic and industrial experience

- **Application Process:** Please contact cito@ngesolutions.com.

Proposed Fee structure (very rough numbers)

- \$300 per Course taught through a professional development company
- \$900 for a CITO Certificate
- Tuition includes all text materials and access to all SPACE resources
- Additional fees may be required for Courses taught by HU for University Credit

Course C0: IT Principles for eBusiness and eGovernment

- Serves to bridge the IT gap for ITOs
- Provides a rigorous overview of the current, as well as emerging, IT building blocks (applications, computing platforms, databases, and networks).
- Emphasizes the Internet, broadband wired and wireless networks, classical Web, Semantic Web, XML, Web 2.0+, social networking, mobile computing, and intelligent systems concepts.
- Heavily relies on hands-on experiments for learning

6. ISEM (Information Systems Engineering & Management) Program

The Harrisburg University of Science and Technology is a new and unique university that is focusing on STEM (Science, Technology, Engineering, and Mathematics). Located in Harrisburg, capital of the Commonwealth of Pennsylvania, it offers graduate degrees in ISEM (Information Systems Engineering & Management), Project Management, and Learning Technologies. For more information, please visit www.harrisburgu.edu

ISEM (Information Systems Engineering & Management) is a 36 semester hour graduate program. It is designed to educate the IT leaders who can plan, engineer/re-engineer, and manage the systems needed to support the modern digital enterprises. Graduate studies in ISEM cut across the following three active areas of work:

- *Information Systems:* latest technologies and approaches (e.g., web-based components, mobile computing and wireless communications, business intelligence, emerging technologies)
- *Systems Engineering:* systems thinking and emphasis on systems instead of individual components; enterprise architectures consisting of people, processes and technologies
- *Management:* business strategies, entrepreneurship, planning, integration, security, governance, global enterprises, agile enterprises

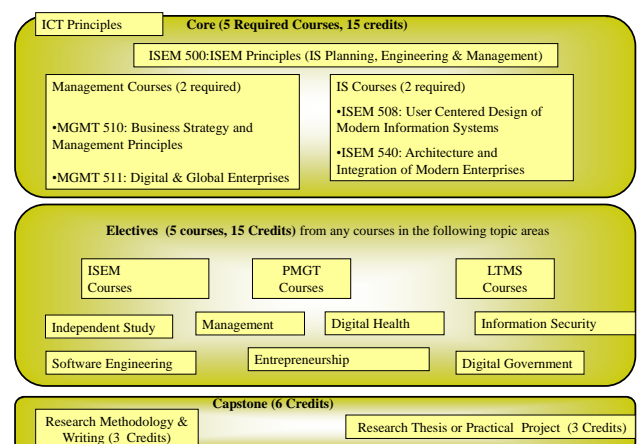
ISEM is a flexible and interdisciplinary program that emphasizes the enterprise architecture, planning and management issues at global levels. An ISEM student may specialize in the following areas:

- Cyber Security
- Digital Government and Digital Health
- Enterprise Architectures
- Entrepreneurship
- Project Management
- Software Engineering and Development)
- No Specialization (take different courses from different areas of your interest)

The core courses of the program provide the student with a strong, relevant and timely background in strategic planning, systems

engineering, business strategy, global and digital enterprises, user centered design, systems analysis and design, and enterprise architectures and integration. The student can then take elective courses in topics that span project management, multimedia management, entrepreneurship, digital governments, digital health, enterprise management, leadership, financial aspects of systems, learning technologies, business intelligence, Internet technologies, information security and governance, mobile computing, and others. Students can also pursue independent studies and master's thesis projects to investigate areas of individual or professional interest.

An experiential project course serves as the required capstone of the program. This consists of a Research Methodology and Writing course and a Research Thesis or Practical Project in the broad discipline of ISEM.



For more information, please visit the ISEM site: <http://www.harrisburgu.edu/academics/graduate/isem.php>

7. SPACE (Strategic Planning, Architecture, Controls & Education) - A Computer Aided Environment for the ITOs

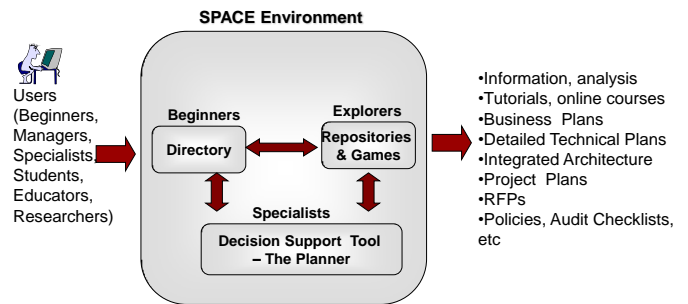
[Website \(www.space4ictd.com\)](http://www.space4ictd.com)

SPACE (Strategic Planning, Architecture, Controls, and Education) is a computer aided environment for eBusiness and eGovernment in global settings. It provides a set of integrated tools needed to support the entire Learn-Plan-Do-Check cycle for IT Officials (e.g., middle and top managers, project managers, initiative leaders, enterprise architects, systems planners, systems analysts and others) involved in eBusiness and eGovernment projects. These officials need to plan, architect, and manage high impact IT services in health, education, economic development, transportation, public safety, public welfare, manufacturing, telecommunications and other vital areas. These individual services can also be combined into powerful “composites” for enterprise-wide as well as inter-enterprise services.

SPACE is especially suitable to support the CITO (Certificate for Information Technology Officials) because it is based on a computer aided consulting model – good consultants are good problem solvers plus educators. SPACE Environment -- spinoff of the UN GAID eNabler Project that has been endorsed by more than 100 countries -- quickly produces highly customized plans for the type of service as well as the country/region by using the latest thinking in the field. In fact, SPACE is a Platform for ICT management (very much like MS Office is a platform for office work -- you use different tools for different type of work). It significantly reduces failures due to trial and error and consists of many well coordinated tools, displayed in the following diagram.

- A **Directory** that serves as an index for the beginners who are interested in understanding the various IT services and

the role they play in supporting different public and private initiatives.



- A set of **Repositories, Games and Tools** that provide links to the appropriate information, games and simulations, case studies and tools needed by the users who want to explore the various resources in more detail.
- **An Intelligent Decision Support Tool (the ePlanner)** for the specialists and officials in governments and the private sectors who need to actually plan, implement, and manage the needed IT initiatives quickly and effectively by using the best practices. The Planner produces detailed strategic plans for a wide range of eGovernment services based on best practices and standards.

These SPACE tools are used extensively in all courses of the CITO Program for exploration, what-if analysis and self assessment assignments. After the courses, the users can continue to use these tools for real life problem solving.

For more information about SPACE, please visit the website www.space4ictd.com.