Work Package 2

Global Competency Model for Graduate Programs in Information Systems

Joint AIS/ACM MSIS 2016 Task Force

Establishing Modern Master-level Studies in Information Systems


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Portugal
MSIS 2016
Global Competency Model for Graduate Programs in Information Systems

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June 2017
MSIS 2016
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MSIS 2016
A global effort
# Joint AIS/ACM MSIS 2016 Task Force

## AIS
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- Bernard C.Y. Tan, National University of Singapore, Singapore
- Sue Brown, University of Arizona, USA
- João Alvaro Carvalho, Universidade do Minho, Portugal

## ACM
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- Brian Donnellan, Maynooth University, Ireland
- Mark Thouin, University of Texas at Dallas, USA
- Jun Shen, University of Wollongong, Australia
MSIS 2016
A global effort

Bernard Tan
Heikki Topi
Brian Donnellan
Eija Karsten

Jun Shen
Sue Brown
Mark Thouin
João A Carvalho
# MSIS 2016 Schedule

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>April</td>
<td>Task force meeting in Amsterdam</td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>Conference panels (ECIS, PACIS, AMCIS)</td>
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<tr>
<td></td>
<td>August</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; draft for comments</td>
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<tr>
<td></td>
<td>Autumn</td>
<td>Data collection (universities, academics, industry)</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>MIS Academic Leadership Conference</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>Task force meeting during ICIS (Fort Worth, USA); AIS SIG-ED panel</td>
</tr>
<tr>
<td>2016</td>
<td>March</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; draft for comments</td>
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<tr>
<td></td>
<td>Summer</td>
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<td>July</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; draft for comments</td>
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<tr>
<td></td>
<td>August</td>
<td>Task force meeting during AMCIS (San Diego, USA)</td>
</tr>
<tr>
<td></td>
<td>Autumn</td>
<td>Writing final draft</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>Submission of final version to AIS and ACM MALC 2016</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>MSIS 2016 launched at ICIS (Dublin, Ireland)</td>
</tr>
</tbody>
</table>
CURRICULA RECOMMENDATIONS IN INFORMATION SYSTEMS
Curricula recommendations for IS

• **197x** - ACM Curriculum Committee on Computer Education for Management
Curricula recommendations for IS

• 198x - ACM Curriculum Committee on Information Systems
Curricula recommendations for IS

• **199x**
  
  
Curricula recommendations for IS

• 200x

Curricula recommendations for IS

- **201x**

- Topi, Heikki; Karsten, Helena; Brown, Sue A.; Carvalho, João Alvaro; Donnellan, Brian; Shen, Jun; Tan, Bernard C.Y.; and Thouin, Mark F. (2017) "MSIS 2016 Global Competency Model for Graduate Degree Programs in Information Systems", Communications of the Association for Information Systems: Vol. 40 , Article 18. Available at: http://aisel.aisnet.org/cais/vol40/iss1/18
IS curricula recommendations:
A long journey


• **AIS** - Association for Information Systems
• **ACM** – Association for Computing Machinery
• **AITP** - Association of Information Technology Professionals (formerly DPMA – Data Processing Management Association)
• **IEEE** – Institute for Electrical and Electronics Engineers
IS VERSUS OTHER AREAS
The 2005 Computing Curricula (AIS, ACM, IEEE-CS)

• Differentiating among:
  – Computer Engineering
  – Computer Science
  – Software Engineering
  – Information Technology
  – Information Systems

The Computing Field

Computing—the goal-oriented activity that requires, benefits from, or creates computers—is a vibrant and challenging academic and professional field. The expansion and evolution of computing led to the specialization of knowledge and the emergence of several related, but quite different from each other, computing disciplines. In order to improve understanding of this family of disciplines by newcomers, but also among computing practitioners, the Association for Computing Machinery (ACM), the Association for Information Systems (AIS) and the Computer Society of the Institute for Electrical and Electronic Engineers (IEEE-CS) have sponsored a set of reports that point out the commonalities and differences between the computing disciplines. This poster provides a synthetic interpretation of those reports, highlighting the problem space scope, main knowledge areas and core performance capabilities of each of the five major computing disciplines: computer engineering, computer science, information systems, information technology, and software engineering.

### Problem Space Scope

- **Computer Engineering (CE)**
  - Design and implement computing systems, computer-controlled equipment and communication software
  - Maintain computing systems that involve the integration of software and hardware devices

- **Computer Science (CS)**
  - Design & implement software
  - Develop solutions to computing problems
  - Optimize programming solutions
  - Prove theoretical results
  - Devise new ways to use computers

- **Information Systems (IS)**
  - Foundations of information systems
  - Data & information management
  - Information systems strategy, management & acquisition
  - Enterprise architecture
  - Systems analysis & design
  - Information technology infrastructure
  - Project management
  - Improve organizational processes
  - Exploit technological innovations
  - Define information requirements
  - Design enterprise architecture
  - Secure data & infrastructure
  - Manage information systems risks

- **Information Technology (IT)**
  - Technical support
  - Programming fundamentals
  - Information management
  - Information technology fundamentals
  - Systems integration
  - Mathematical fundamentals
  - Interpersonal communication
  - Train and support users
  - Plan, select, configure & maintain information systems infrastructure
  - Model, design, select, configure & manage databases
  - Configure & integrate business applications

- **Software Engineering (SE)**
  - Computing essentials
  - Software modeling & analysis
  - Software design
  - Software verification & validation
  - Professional practice
  - Mathematical & engineering fundamentals
  - Project management
  - Do small-scale & large-scale programming
  - Develop software systems
  - Manage software projects
  - Implement information systems
  - Define information systems technical requirements

### Main Knowledge Areas

- **Computer Engineering (CE)**
  - Computer architecture & organization
  - Computer systems engineering
  - Digital logic
  - Programming fundamentals
  - Distributed systems
  - Circuits & systems
  - Electronics
- **Computer Science (CS)**
  - Software development fundamentals
  - Algorithms & complexity
  - Software engineering
  - Programming languages
  - Discrete structures
  - Systems fundamentals
  - Computer architecture & organization
- **Information Systems (IS)**
  - Design & implement software
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  - Information systems strategy, management & acquisition
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  - Information technology infrastructure
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  - Mathematical fundamentals
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  - Software design
  - Software verification & validation

### Core Performance Capabilities

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### Sources

- CS (2004). Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering. ACM-CS and ACM.
- CS (2013). Curriculum Guidelines for Undergraduate Degree Programs in Computer Science. ACM and IEEE.
- IS (2010). Curriculum Guidelines for Undergraduate Degree Programs in Information Systems. ACM and AIS.
- IT (2008). Curriculum Guidelines for Undergraduate Degree Programs in Information Technology. ACM and IEEE-CS.

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Centro ALGORITMI
School of Engineering
University of Minho
Guimarães, Portugal

May 2014
Version 1.0
Problem Space of Computing

<table>
<thead>
<tr>
<th>Organizational Issues &amp; Information Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Technologies</td>
</tr>
<tr>
<td>Software Methods and Technologies</td>
</tr>
<tr>
<td>Systems Infrastructure</td>
</tr>
<tr>
<td>Computer Hardware and Architecture</td>
</tr>
</tbody>
</table>

DEVELOPMENT

More Theoretical  More Applied

Theory Principles Theory

Application Deployment Application Deployment
Computing—the goal-oriented activity that requires, benefits from, or creates computers—is a vibrant and challenging academic and professional field. The expansion and evolution of computing led to the specialization of knowledge and the emergence of several related, but quite different from each other, computing disciplines. In order to improve understanding of this family of disciplines by newcomers, but also among computing practitioners, the Association for Computing Machinery (ACM), the Association for Information Systems (AIS), and the Computer Society of the Institute for Electrical and Electronic Engineers (IEEE-CS) have sponsored a set of reports that point out the commonalities and differences between computing disciplines. This poster provides a synthetic interpretation of those reports, highlighting the problem space scope, main knowledge areas and core performance capabilities of each of the five major computing disciplines: computer engineering, computer science, information systems, information technology, and software engineering.

### Problem Space Scope

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<th>Information Systems</th>
<th>Information Technology</th>
<th>Software Engineering</th>
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<tbody>
<tr>
<td>Design and implement computing systems, computer-controlled equipment and communication software</td>
<td>Software development fundamentals</td>
<td>Foundations of information systems</td>
<td>Technical support</td>
<td>Computing essentials</td>
</tr>
<tr>
<td>Design and implement software</td>
<td>Algorithms &amp; complexity</td>
<td>Data &amp; information management</td>
<td>Programming fundamentals</td>
<td>Software modeling &amp; analysis</td>
</tr>
<tr>
<td>Develop solutions to computing problems</td>
<td>Software engineering</td>
<td>Information systems strategy, management &amp; acquisition</td>
<td>Information management</td>
<td>Software design</td>
</tr>
<tr>
<td>Optimize programming solutions</td>
<td>Programming languages</td>
<td>Enterprise architecture</td>
<td>Information technology fundamentals</td>
<td>Software verification &amp; validation</td>
</tr>
<tr>
<td>Prove theoretical results</td>
<td>Discrete structures</td>
<td>Systems analysis &amp; design</td>
<td>Systems integration</td>
<td>Professional practice</td>
</tr>
<tr>
<td>Devise new ways to use computers</td>
<td>Systems fundamentals</td>
<td>Information technology infrastructure</td>
<td>Mathematical fundamentals</td>
<td>Mathematical &amp; engineering fundamentals</td>
</tr>
<tr>
<td>Maintain computing systems that involve the integration of software and hardware devices</td>
<td>Computer architecture &amp; organization</td>
<td>Project management</td>
<td>Interpersonal communication</td>
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### Main Knowledge Areas

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<td>Systems integration</td>
<td>Professional practice</td>
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<td>Mathematical &amp; engineering fundamentals</td>
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<td>Project management</td>
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### Core Performance Capabilities

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**May 2014**

**Version 1.0**
IS versus other areas

- Markets
- Businesses
- Organizations
- Organizational Processes
- IT Applications
- Platforms for IT Applications
- Computing and Communications Infrastructures
- Computers, Peripherals, Networks
- Electronic Devices
IS versus other areas

Markets
Businesses
Organizations
Organizational Processes
IT Applications
Platforms for IT Applications
Computing and Communications Infrastructures
Computers, Peripherals, Networks
Electronic Devices

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IS versus other areas

- Markets
  - Business, Management, ...
- Businesses
- Organizations
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- IT Applications
  - Computer Science
    - Platforms for IT Applications
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IS versus other areas

Markets
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Organizational Processes
IT Applications

Business, Management, ...

Information Systems
Platforms for IT Applications
Computing and Communications Infrastructures
Computers, Peripherals, Networks
Electronic Devices

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IS versus other areas

**Social world** - beliefs, expectations, commitments, contracts, social laws, culture, ...

**Pragmatics** - intentions, communication, conversations, negotiations, speech acts, ...

**Semantics** - meanings, propositions, validity truth, signification, denotations, ...

**Syntactics** - formal structure, language, logic, data, records, deduction, software, files, ...

**Empirics** - pattern, variety, noise, entropy, channel capacity, codes, efficiency, redundancy, ...

**Physical world** - signals, traces, physical distinctions, hardware, physical tokens, component density, speeds, economics, laws of nature, ...
IS versus other areas

**Social world** - beliefs, expectations, commitments, contracts, social laws, culture, ...

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**Electronics**

**Physical world** - signals, traces, physical distinctions, hardware, physical tokens, component density, speeds, economics, laws of nature,...
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Computer Science

Physical world - signals, traces, physical distinctions, hardware, physical tokens, component density, speeds, economics, laws of nature,...
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**Information** Systems

**Social world** - beliefs, expectations, commitments, contracts, social laws, culture, ...

**Electronics**
The IS area

Enterprise
- Business
  - Business model
  - Governance
  - Customer experience
  - Organize
- Organization
  - External vigilance (intelligence), prospective
  - Plan, monitor, control, command
  - Collaboration, Coordination
- Process
  - Adaptation, Learning, Innovation
- Project
- Team
- Work unit
- Decision-making

Market

Society
- City
- Community
- Collective action
- Group
- Family
- Individual
  - Work, Leisure, Social Life

Human and Social Pursuits and Affairs

Information Technology

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The IS area

Business, Strategy, Management, Administration, …
The IS area

Business, Strategy, Management, Administration, …

Information Systems

Information Science

Computer Science, Software Engineering, Informatics, …

Human and Social Pursuits and Affairs

Decision-making

Market

Enterprise

Business model

Organization

Process

Project

Collaboration, Coordination

Plan, monitor, control, command

Governance

Customer experience

Adaptation, Learning, Innovation

Governance

Family

Group

Team

Work unit

Individual

Work

Leisure

Social Life

Enterprise

Market

Society

City

Community

Collective action

Group

Adaptation, Learning, Innovation

Information

Cognition

Communication

IT Infrastructure

Information Science

Computer Science, Software Engineering, Informatics, …

Information Technology

IT Application

IT Infrastructure

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The IS area

The IS area

Professional activities involving the establishment or change of human pursuits and entities

Professional activities involving the creation or improvement of IT-related artifacts (to be used in human and social pursuits)

Professional activities addressing information organization, storage, dissemination, ...

Human and social pursuits and affairs

Information

IT artifacts

make use of

inescapable in

roused by

designed, built, and deployed to enhance / enable

Perspective privileging the human and social pursuits and their establishment and change

Perspective privileging the IT artifacts and their creation and improvement

Perspective privileging information, its role in human and social pursuits, and how it is roused by IT

Systems thinking

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# Macro-activities of IS professionals

<table>
<thead>
<tr>
<th>information and IT-based artefacts in human and social pursuits and affairs</th>
<th>information objects</th>
<th>IT-based artefacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>- (re)engineering of human activity pursuits and organizations (structures), addressing their information processing sphere, aiming at realizing potential benefits from the use of IT, thus involving the implantation of IT applications, artefacts and services;</td>
<td>- setting up information structures and architectures and information processing structures for enterprise and society functions related with control, command, intelligence (competitive vigilance), learning, adaptation and innovation;</td>
<td>- engineering of IT applications capable of addressing the requirements of enterprises;</td>
</tr>
<tr>
<td>- management of information, of IT and of IT-related resources and aspects in organizational units, aiming at assuring that they contribute to the well-being of the embracing human activity pursuits;</td>
<td>- management of information objects;</td>
<td>- installation, configuration and tuning of IT applications;</td>
</tr>
<tr>
<td>- policy-making (at regional, national, multi-national or global levels) concerning social, economic, political and cultural facets sensible to the influence of IT-related developments;</td>
<td>- make use of computable languages to describe information objects;</td>
<td>- selection, installation, configuration and tuning of IT platforms (e.g., DBMS, DW, WFMS, BI, etc.) that support IT applications;</td>
</tr>
<tr>
<td>- ...</td>
<td>- exploit IT applications and platforms to rouse information objects;</td>
<td>- definition of requirements and assessment of compliance and performance of IT infrastructural services;</td>
</tr>
<tr>
<td></td>
<td>- ...</td>
<td>- management of core processes in the software industry sector;</td>
</tr>
</tbody>
</table>

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The IS area

- Demands knowledge and competencies related to the adoption, use and value exploitation of IT in human and social pursuits and affairs;
  - Computer Science/Software Engineering
    - For most situations, IT applications and platforms exist on a COTS/RUSP (*) basis;
  - Business/Strategy/Management
    - The adoption, use and value exploitation of IT applications and platforms are complex issues demanding specialized knowledge and competencies;

(*) COTS – Commercial off-the-shelf; RUSP – Ready to Use Software Products
The IS area - Jobs (within IT-in-general)

The IS area - Jobs (within IT-in-general)
The IS area - Jobs (within IT-in-general)

TOTAL EU28 IT Skills Demand and Supply Forecast

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>5,684,000</td>
<td>5,804,000</td>
<td>5,936,000</td>
<td>6,044,000</td>
<td>6,163,000</td>
<td>6,280,000</td>
<td>2.0%</td>
</tr>
<tr>
<td>Supply</td>
<td>5,503,000</td>
<td>5,603,000</td>
<td>5,741,000</td>
<td>5,850,000</td>
<td>5,959,000</td>
<td>6,060,000</td>
<td>1.9%</td>
</tr>
<tr>
<td>Gap</td>
<td>181,000</td>
<td>201,000</td>
<td>195,000</td>
<td>194,000</td>
<td>204,000</td>
<td>220,000</td>
<td>4.0%</td>
</tr>
<tr>
<td>Gap %</td>
<td>3.2%</td>
<td>3.5%</td>
<td>3.3%</td>
<td>3.2%</td>
<td>3.3%</td>
<td>3.5%</td>
<td></td>
</tr>
</tbody>
</table>

Source: IDC and empirica, 2016

Support

The IS area - Research

• A well established area of research
• AIS – Association for Information Systems (http://aisnet.org/)
The IS area

• Global reach
  – Regional structure (Americas; Europe, Middle East and Africa; Asia-Pacific)
  – Chapters (countries, states)
  – Students chapters
• Journals (JAIS, CAIS) and affiliated journals
• Conferences (ICIS (38th Seoul, South Korea), AMCIS (23th Boston, USA), ECIS (25th Guimarães, Portugal), PACIS (21st Langkawi, Malaysia) and affiliated conferences
• SIG – Special Interest Groups
• Various resources
  – Eduglopedia - https://eduglopedia.org
• ...
• Global reach  
  – Regional structure (Americas; Europe, Middle East and Africa; Asia-Pacific)  
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• ...
Premises

• MSIS is a professional practice master’s degree that always integrates the development of competencies in the realms of:
  – *information systems* (including both computing and IT and IS management)
  – *specific domain of practice*
  – *individual foundational competencies*

• MSIS is based on a completed undergraduate degree that provides a foundation in all three major competency realms
  – Missing competencies can be developed with pre-program bridge courses.
MSIS 2016 High-Level Realms

- Information Systems Competencies
- Domain of Practice Competencies
- Individual Foundational Competencies

Including Computing and IS Management
Premises

• MSIS is a professional practice master’s degree that always integrates the development of competencies in the realms of:
  – information systems (including both computing and IT and IS management)
  – specific domain of practice
  – individual foundational competencies

• MSIS is based on a completed undergraduate degree that provides a foundation in all three major competency realms
  – Missing competencies can be developed with pre-program bridge courses.

• MSIS does not have any general expectations regarding prior professional experience (although an individual program can set its own professional experience requirements)

• The target professional profiles of various MSIS programs vary
Premises

• MSIS does not have any general expectations regarding prior professional experience (although an individual program can set its own professional experience requirements)

• The target professional profiles of various MSIS programs vary
Premises

• The central element of this recommendation comprises specifications for a hierarchy of competency areas, competency categories, and sample competencies for IS.

• In addition, it provides general descriptions of required areas of individual foundational competencies and examples of areas of domain of practice competencies.

• Different professional profiles require different sets of competencies.

• MSIS 2016 specifies four levels at which a student can attain competencies in a category: Awareness, Novice, Supporting (role), and Independent (contributor). A competency profile specifies for each competency category the level the graduates of a program should attain.
Competency Specification Hierarchy for Areas of IS Competencies

• Area of IS Competency (9)
  – High-level competency specifications
    • Description
    • High-level area dimensions
  – Competency categories (4 – 12 per area)
  – Sample competencies (3 – 9 per category)
Graduate Competencies vs. Course Learning Objectives

Program Level (Focus of MSIS 2016)

- Competency Area
  - Name
  - Description
  - High-level Dimensions

- Competency Category
  - Label
  - Description
  - Minimum MSIS level

Module Level (Course and Equivalent)

- Module
- Learning Experience
- Learning Objective
- Course Topic

Course level materials will be based on local designs

Attainment level determined by profile(s)
**Overall Competency Architecture**

**Specialized Competencies**
Specialized Competencies consist of additional Information Systems competencies that build on the core competencies and allow the graduates to perform more sophisticated tasks and act in more specialized professional roles.

### Core Competencies

<table>
<thead>
<tr>
<th>Areas of Information Systems Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Business Continuity and Information Assurance</td>
</tr>
<tr>
<td>- Data, Information and Content Management</td>
</tr>
<tr>
<td>- Enterprise Architecture</td>
</tr>
<tr>
<td>- Ethics, Impacts and Sustainability</td>
</tr>
<tr>
<td>- Innovation, Organizational Change and Entrepreneurship</td>
</tr>
<tr>
<td>- IS Management and Operations</td>
</tr>
<tr>
<td>- IS Strategy and Governance</td>
</tr>
<tr>
<td>- IT Infrastructure</td>
</tr>
<tr>
<td>- Systems Development and Deployment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Areas of Individual Foundational Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Critical Thinking</td>
</tr>
<tr>
<td>- Creativity</td>
</tr>
<tr>
<td>- Collaboration and Team Work</td>
</tr>
<tr>
<td>- Ethical Analysis</td>
</tr>
<tr>
<td>- Intercultural Competency</td>
</tr>
<tr>
<td>- Leadership</td>
</tr>
<tr>
<td>- Mathematical and Statistical Competencies</td>
</tr>
<tr>
<td>- Negotiation</td>
</tr>
<tr>
<td>- Oral Communication</td>
</tr>
<tr>
<td>- Problem Solving</td>
</tr>
<tr>
<td>- Written Communication</td>
</tr>
</tbody>
</table>

Graduate competencies developed building on the foundation of competencies attained in prior studies and work/life experience.

<table>
<thead>
<tr>
<th>Areas of Domain Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core competencies in a domain of human activity such as business, government, health care, law, a field of scientific research, etc.</td>
</tr>
</tbody>
</table>

**Area of Information Systems Competencies with Pre-master’s Elements**

<table>
<thead>
<tr>
<th>Data, Information and Content Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Infrastructure</td>
</tr>
<tr>
<td>IS Management and Operations</td>
</tr>
<tr>
<td>Systems Development and Deployment</td>
</tr>
</tbody>
</table>

Role of Information Systems in Organizations (Foundational Understanding of IS)
Areas of Information Systems Competencies

- Innovation, Organizational Change, and Entrepreneurship
- IS Strategy and Governance
- IT Infrastructure
- Data, Information, and Content Management
- IS Management and Operations
- Systems Development and Deployment
- Enterprise Architecture
- Business Continuity and Information Assurance
- Ethics, Impacts, and Sustainability
# Competency Categories and Minimum Attainment Levels

## MSIS 2016 Global Competency Model

**for Graduate Degree Programs in Information Systems**

<table>
<thead>
<tr>
<th>Competency Category #</th>
<th>Competencies in the area of Business Continuity and Information Assurance (BCIA)</th>
<th>Minimum required level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 BCIA</td>
<td>Managing and implementing cybersecurity</td>
<td></td>
</tr>
<tr>
<td>2 BCIA</td>
<td>Responding to and managing IS problems</td>
<td></td>
</tr>
<tr>
<td>3 BCIA</td>
<td>Monitoring system operations</td>
<td></td>
</tr>
<tr>
<td>4 BCIA</td>
<td>Managing system recovery</td>
<td></td>
</tr>
<tr>
<td>5 BCIA</td>
<td>Managing Information Systems risks</td>
<td></td>
</tr>
<tr>
<td>6 BCIA</td>
<td>Protecting IT assets</td>
<td></td>
</tr>
<tr>
<td>7 BCIA</td>
<td>Developing information assurance strategy</td>
<td></td>
</tr>
<tr>
<td>8 BCIA</td>
<td>Engineering systems for continuity</td>
<td></td>
</tr>
<tr>
<td>9 BCIA</td>
<td>Implementing and managing quality audit processes</td>
<td></td>
</tr>
<tr>
<td>10 BCIA</td>
<td>Assuring safety throughout systems lifecycle</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competencies in the area of Data, Information and Content Management (DATA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 DATA</td>
</tr>
<tr>
<td>12 DATA</td>
</tr>
<tr>
<td>13 DATA</td>
</tr>
<tr>
<td>14 DATA</td>
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<tr>
<td>15 DATA</td>
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<td>16 DATA</td>
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<tr>
<td>17 DATA</td>
</tr>
<tr>
<td>18 DATA</td>
</tr>
<tr>
<td>19 DATA</td>
</tr>
</tbody>
</table>
Individual Foundational Competencies

- Critical thinking
- Creativity
- Collaboration and team work
- Ethical analysis
- Intercultural competency
- Leadership
- Mathematical and statistical competencies
- Negotiation
- Oral communication
- Problem solving
- Written communication
<table>
<thead>
<tr>
<th><strong>Critical thinking</strong></th>
<th>A definition that captures well the meaning of this competency in the MSIS 2016 context is the following critical thinking definition by Halpern (2003): “Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example in IS: Monitor and evaluate new methods for network security</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Collaboration and teamwork</strong></th>
<th>Our definition for collaboration is based on Stevens and Campion (1994), who identified the following five competency requirements for teamwork: 1) conflict resolution; 2) collaborative problem solving; 3) communication; 4) performance and rewards; 5) leadership and support. Building on Connock and Johns (1995) and Orme and Ashton (2003), we define ethical analysis competency in an organizational context as follows: Ethical analysis focuses on determining what is right and what is wrong and it is “about defining the practices and rules that underpin responsible conduct between individuals and groups” (Connock and Johns, 1995). Ethical competency requires</th>
</tr>
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<tbody>
<tr>
<td><strong>Example in IS: participate effectively in teams</strong></td>
<td></td>
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<tr>
<th><strong>Ethical analysis</strong></th>
<th>Building on Connock and Johns (1995) and Orme and Ashton (2003), we define ethical analysis competency in an organizational context as follows: Ethical analysis focuses on determining what is right and what is wrong and it is “about defining the practices and rules that underpin responsible conduct between individuals and groups” (Connock and Johns, 1995). Ethical competency requires</th>
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</thead>
<tbody>
<tr>
<td><strong>Example in IS: Determine whether or not a new data-driven business process is using customer data in an ethically sustainable way</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Negotiation</strong></th>
<th>Pruitt (1981) defines negotiation as “a form of decision making in which two or more parties talk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example in IS: Negotiate a contract with an outsourcing partner in another country</strong></td>
<td>Our definition here is from Deardorff (2006): “Intercultural competency is the ability to develop targeted knowledge, skills, and attitudes that lead to visible behavior and communication that are both effective and appropriate in intercultural interactions.”</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th><strong>Intercultural competency</strong></th>
<th>Our definition here is from Deardorff (2006): “Intercultural competency is the ability to develop targeted knowledge, skills, and attitudes that lead to visible behavior and communication that are both effective and appropriate in intercultural interactions.”</th>
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<tbody>
<tr>
<td><strong>Example in IS: negotiate a contract with an outsourcing partner in another country</strong></td>
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</tr>
</tbody>
</table>
MSIS 2016 - PROCESS
MSIS 2016 - Process

- Task Force coordination
  - Weekly conference calls involving the co-chairs
  - Monthly conference calls involving all the task force members
  - 3 meetings
    - April 2015; December 2015; August 2016
- Identification and analysis of MS IS programs
  - Europe, Middle East and Africa; Americas; Asia-Pacific
- Survey on IS competences
  - Academy and Industry
- Interim deliverables made available with worldwide calls for feedback
  - August 2015, March 2016, and July 2016
- Analysis of frameworks of competencies of IS and IT professionals
  - e-CF, SFIA, ...
- Panels in major IS conferences
USING THE MSIS 2016 TO DESIGN A MSIS PROGRAM
THANK YOU FOR YOUR ATTENTION

QUESTIONS?