



# **MS in Information Systems & Assurance (MS-ISA)**

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# What is Information Systems?

- Information systems is a knowledge area and skill set at the intersection of:
  - Computer, software, and network technology
  - Management (including most functional specialty areas)
- IS graduates apply knowledge/skills in both areas to enable organizations fulfill their missions
- Tasks performed by IS graduates include:
  - Design and administer organizational information, transaction processing, and decision support systems
  - Acquire hardware, software, and web services from third-parties and manage the associated contracts
  - Design and administer databases and data warehouses
  - Use internal and external data to improve marketing, operations, and strategic planning – i.e., data analytics
  - Implement and manage corporate-wide intranets, public-facing Web sites, and social media channels

# What is Information Assurance?

- Committee on National Security Systems (CNSS) defines information assurance (IA):



*Measures that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and nonrepudiation*

- Obvious topic areas:
  - Encryption
  - Network security
  - Intrusion detection
  - Secure coding practices
  - Digital forensics
- Not-so-obvious topic areas:
  - Fraud & forensic accounting
  - Security policy & implementation
  - Legal and privacy issues
  - Education & training

- UNM is designated by the Department of Homeland Security and National Security Agency as a:

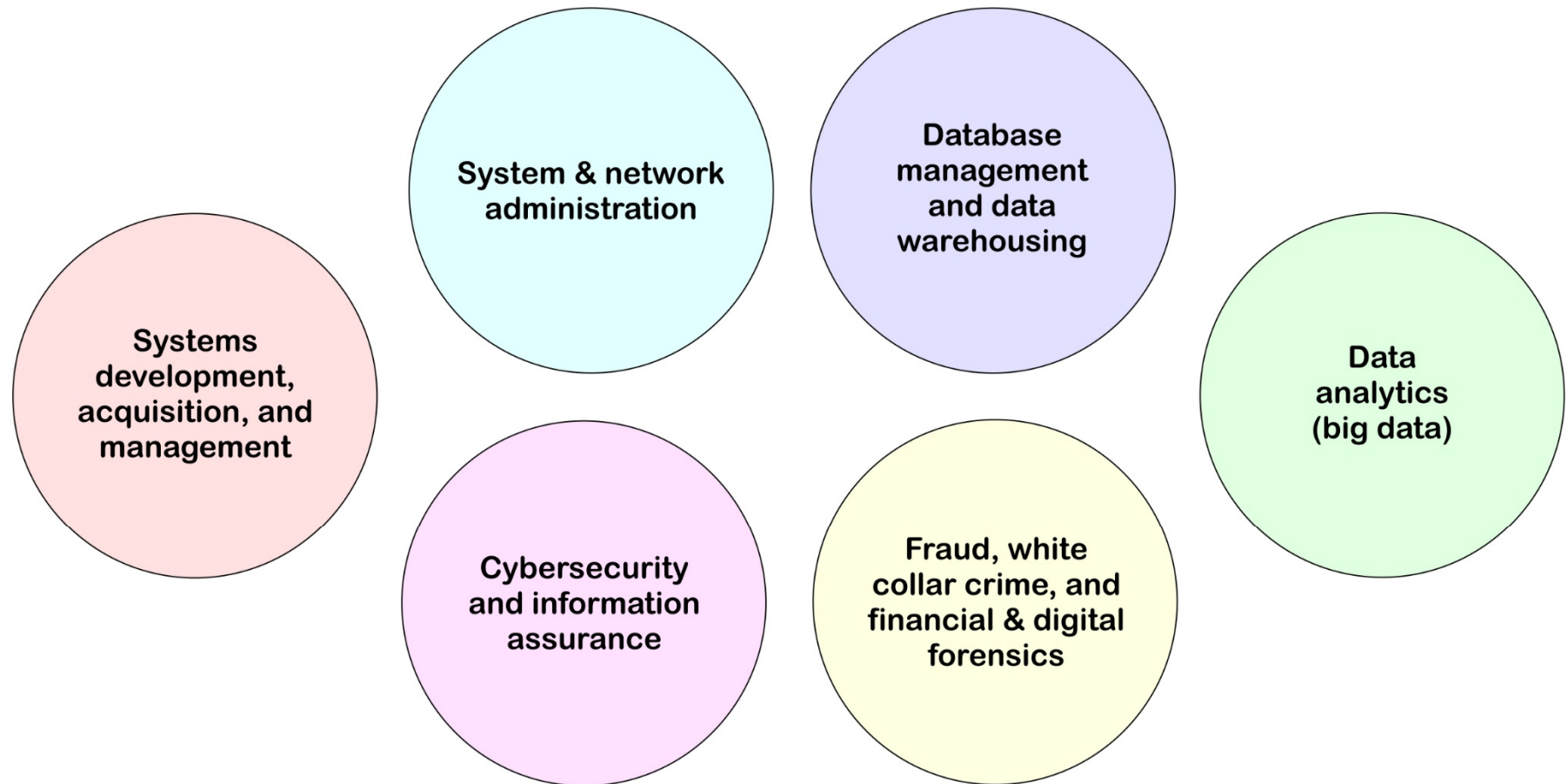
**Center of Academic Excellence in Information Assurance Education and Research**



# Goals of the MS-ISA Program

- Attract students with undergraduate degrees in:
  - Management (accounting and IS preferred)
  - Computer science
  - Computer engineering
- Prepare them for advanced technology-related management careers by:
  - Providing sufficient technical depth in one or more focus areas to ensure that program graduates are competitive for a wide variety of local and national jobs
  - Enable faculty and students to tailor programs of study to individual student backgrounds and career goals

# MS-ISA Technical Focus Areas



# Career Pathways for Program Graduates

Specialty	Job Titles
Information Systems	Systems Analyst Database administrator Data Analyst Application Developer Chief Information Officer
Combined IS/IA	System Administrator Network Administrator
Information Assurance	Network Security Administrator Chief Security Officer Compliance Officer Digital Forensic Analyst Internal Auditor Public Auditor

# Occupational Outlook

Quick Facts: Computer and Information Systems Managers	
<b>2012 Median Pay</b>	\$120,950 per year \$58.15 per hour
<b>Entry-Level Education</b>	Bachelor's degree
<b>Work Experience in a Related Occupation</b>	5 years or more
<b>On-the-job Training</b>	None
<b>Number of Jobs, 2012</b>	332,700
<b>Job Outlook, 2012-22</b>	15% (Faster than average)
<b>Employment Change, 2012-22</b>	50,900

Quick Facts: Information Security Analysts	
<b>2012 Median Pay</b>	\$86,170 per year \$41.43 per hour
<b>Entry-Level Education</b>	Bachelor's degree
<b>Work Experience in a Related Occupation</b>	Less than 5 years
<b>On-the-job Training</b>	None
<b>Number of Jobs, 2012</b>	75,100
<b>Job Outlook, 2012-22</b>	37% (Much faster than average)
<b>Employment Change, 2012-22</b>	27,400

Quick Facts: Database Administrators	
<b>2012 Median Pay</b>	\$77,080 per year \$37.06 per hour
<b>Entry-Level Education</b>	Bachelor's degree
<b>Work Experience in a Related Occupation</b>	Less than 5 years
<b>On-the-job Training</b>	None
<b>Number of Jobs, 2012</b>	118,700
<b>Job Outlook, 2012-22</b>	15% (Faster than average)
<b>Employment Change, 2012-22</b>	17,900

Quick Facts: Network and Computer Systems Administrators	
<b>2012 Median Pay</b>	\$72,560 per year \$34.88 per hour
<b>Entry-Level Education</b>	Bachelor's degree
<b>Work Experience in a Related Occupation</b>	None
<b>On-the-job Training</b>	None
<b>Number of Jobs, 2012</b>	366,400
<b>Job Outlook, 2012-22</b>	12% (As fast as average)
<b>Employment Change, 2012-22</b>	42,900

US Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook for 2012-2022

# MS-ISA Key Challenges

- Ensure that graduates have sufficient knowledge and skills in the following key areas:
  - Communication and presentation skills
  - Project management
  - Management breadth (especially accounting, operations, and organizational behavior)
  - One or more technology focus areas
- Provide sufficient program flexibility to:
  - Accept students from diverse backgrounds (accounting, information systems, computer science, and engineering)
  - Ensure minimum knowledge and skills in key areas
  - Provide advanced knowledge in at least one technology focus area



# MS-ISA Program Requirements

- Students must complete a minimum of 32 credit hours of courses within the following groups:
  - Required Group — 11 credit hours
    - ❑ MGMT 533 (Professional communications)
    - ❑ MGMT 631 (Project management)
    - ❑ MGMT 636 (IS security)
    - ❑ MGMT 637 (Database management)
    - ❑ **Courses may be waived based on similar undergraduate/graduate courses or experience.**
  - Management Group — 12 credit hours minimum selected from:
    - ❑ MGMT 502 (Financial accounting)
    - ❑ MGMT 503 (Managerial accounting)
    - ❑ MGMT 506 (Organizational behavior)
    - ❑ MGMT 508 (Law/ethics)
    - ❑ MGMT 520 (Operations management)
    - ❑ MGMT 522 (Marketing)
    - ❑ MGMT 526 (Finance)
    - ❑ MGMT 633 (Vendor & contract management)
    - ❑ **Up to 12 credit hours may be waived based on similar undergraduate/graduate courses or experience**
  - Technology Group – 9-32 credit hours – see next page
- **Waivers of required/management group courses provide flexibility to tailor the program to individual student backgrounds.**

# MS-ISA Program Requirements - Continued

- Technology Group – 9 credit hour minimum
  - MGMT 594 (Internal auditing)
  - MGMT 630 (Management of information systems)
  - MGMT 632 (Web application development)
  - MGMT 634 (Systems analysis and design)
  - MGMT 635 (Business intelligence and decision support)
  - MGMT 638 (Advanced database management)
  - MGMT 639 (Advanced IS/IA topics) –Data warehousing, Data analytics II, ...
  - MGMT 641 (Forensic accounting)
  - MGMT 642 (Fraud examination)
  - MGMT 646 (Digital forensics)
  - MGMT 647 (System and network administration)
  - MGMT 648 (Advanced IS security)
  - MGMT 649 (IA projects)
  - MGMT 599 (Thesis)
  - CS 544 (Cyber-security)
  - CS 565 (Topics in database management)
  - CS 581 (Software testing)
  - ECE 595 (Cloud security)
  - Other graduate-level CS and ECE courses with advance approval
  - Problems/topics/internship courses (MGMT 551/552, 594, and 697) with advance approval

# MS-ISA Program - Admission/ Advisement

## ➤ Admission Requirements

- Completed bachelor's degree with at least 30 credit hours of courses in management, computer science, or computer-related engineering.
- A grade point average of 3.0 for the last 60 hours of college coursework including any post baccalaureate work.
- A score equal to or greater than 500 on the Graduate Management Admission Test (GMAT) or a Graduate Record Examination (GRE) score that is equal to or greater than 500 on the quantitative section and a score equal to or greater than 500 on the verbal section.

## ➤ Advisement and Plan of Study

- Advisement prior to first-semester enrollment and a formal plan of study is mandatory.
- Individual students are advised to enroll in specific classes that:
  - Match their intended career path
  - Complement their bachelor's degree and work experience
- Plan of study approvals are granted by a designated faculty advisor or committee.

# Sample Study Plan – BBA/MIS – IS Specialty

- Core Group – 5 credit hours (636/637 waived based on undergraduate courses):
  - MGMT 533 (Professional communications)
  - MGMT 631 (Project management)
- Management Group – 3 credit hours (others waived based on BBA core):
  - MGMT 633 (Vendor & contract management)
- Technology Group – 24 credit hours
  - MGMT 630 (Management of information systems)
  - MGMT 632 (Web application development)
  - MGMT 635 (Business intelligence and decision support)
  - MGMT 639 (Advanced database management)
  - MGMT 639 (Data warehousing)
  - MGMT 639 (Data analytics II)
  - MGMT 647 (System and network administration)
  - MGMT 648 (Advanced IS security)

# Sample Study Plan – BBA/MIS – IA Specialty

- Core Group – 5 credit hours (636/637 waived based on undergraduate courses):
  - MGMT 533 (Professional communications)
  - MGMT 631 (Project management)
- Management Group – 3 credit hours (others waived based on BBA core):
  - MGMT 633 (Vendor & contract management)
- Technology Group – 24 credit hours
  - MGMT 635 (Business intelligence and decision support)
  - MGMT 639 (Advanced database management)
  - MGMT 641 (Forensic accounting)
  - MGMT 642 (Fraud examination)
  - MGMT 646 (Digital forensics)
  - MGMT 647 (System and network administration)
  - MGMT 648 (Advanced IS security)
  - MGMT 649 (IA projects)

# Sample Study Plan – BS CS/ECE – IS Specialty

- Core Group – 5 credit hours (636/637 waived based on undergraduate courses):
  - MGMT 533 (Professional communications)
  - MGMT 631 (Project management)
- Management Group – 12 credit hours (others waived based on BBA core):
  - MGMT 502 (Financial accounting)
  - MGMT 503 (Managerial accounting)
  - MGMT 506 (Organizational behavior)
  - MGMT 522 (Marketing)
- Technology Group – 15 credit hours
  - MGMT 635 (Business intelligence and decision support)
  - MGMT 639 (Advanced database management)
  - MGMT 639 (Data warehousing)
  - MGMT 639 (Data analytics II)
  - MGMT 648 (Advanced IS security)

# Sample Study Plan – BS CS/ECE – IA Specialty

- Core Group – 5 credit hours (636/637 waived based on undergraduate courses):
  - MGMT 533 (Professional communications)
  - MGMT 631 (Project management)
- Management Group – 12 credit hours (others waived based on BBA core):
  - MGMT 502 (Financial accounting)
  - MGMT 503 (Managerial accounting)
  - MGMT 506 (Organizational behavior)
  - MGMT 522 (Marketing)
- Technology Group – 15 credit hours
  - MGMT 642 (Fraud examination)
  - MGMT 646 (Digital forensics) or CS 544 (Cybersecurity)
  - MGMT 647 (System and network administration)
  - MGMT 648 (Advanced IS security)
  - ECE 595 (Cloud security)

# Sample Study Plan – BBA/ Acctg – IA Specialty

- Core Group – 11 credit hours:
  - MGMT 533 (Professional communications)
  - MGMT 631 (Project management)
  - MGMT 636 (IS security)
  - MGMT 637 (Database management)
- Management Group – 3 credit hours (others waived based on BBA core):
  - MGMT 633 (Vendor & contract management)
- Technology Group – 18 credit hours
  - MGMT 594 (Internal auditing)
  - MGMT 641 (Forensic accounting)
  - MGMT 642 (Fraud examination)
  - MGMT 646 (Digital forensics)
  - MGMT 648 (Advanced IS security)
  - MGMT 649 (IA projects)



# Current Status

- The program went “live” in August
- 8 students will graduate with an MS-ISA in December
- Approximately 50-60 current MBA and non-degree graduate students will transfer into the MS-ISA program in the next few weeks
- New student applications are currently being accepted for spring admission (soft deadline is October 1)
- The program will be operating near capacity as of January, 2015
- MBA IA concentration is now closed and the MIS concentration may close in the near future

# What's Next?

- Accept individual dual degree proposals from students per UNM policy?
  - MS-ISA plus MBA
  - MS-ISA plus Master's of Accounting
  - MS-ISA plus MS in computer science or engineering
- 3/2 program with BS in Computer Science or BS in Electrical and Computer Engineering?
- Increase the proportion of the program that's offered online?
- Increase program capacity and recruit nationally?