Information Technology Advisory Meeting

Fall 2019 Agenda

September 23,2019 @ 6:30 pm

MSCTC Moorhead B150

**Agenda for Fall 2019**

* MSCTC/M State welcome and updates
  + Communications Check (Audio and Video)
  + Additions/approval of agenda
  + Approval of last meeting minutes
  + Introductions and membership list updates
    - *Note: MState recommends a sign in sheet. Please bring or send a business card so we may populate the sign in sheet, thank you.*
* Chair/Vice Chair discussion/elections
  + *Vice Chair progress report*
* Discussion of Industry Trends
  + Review ACM curricula recommendations
    - Which programs should focus on which parts of the recommendations?
    - Remember, the recommendations are for four-year degrees. An M State program could accomplish almost half.
  + Advisory Group Comments
    - Is anyone using Google doc instead of Office in the workplace?
  + Survey Link for the meeting
    - [http://brazil.minnesota.edu/advisory/advisory.html | Current\_Meeting\_Agenda\_\_Minutes](http://brazil.minnesota.edu/advisory/advisory.html%20%20|%20Current_Meeting_Agenda__Minutes)
  + Program Updates/Changes since last meeting
  + Computer Programming – AAS
    - <http://brazil.minnesota.edu/curr/CP_AAS_2017.pdf>
    - Outcome Review
  + Information Technology Database Administration – AAS
    - <http://brazil.minnesota.edu/curr/IT_database_fall2017.pdf>
    - Survey Link
    - [http://brazil.minnesota.edu/advisory/advisory.html | Current\_Meeting\_Agenda\_\_Minutes](http://brazil.minnesota.edu/advisory/advisory.html%20%20|%20Current_Meeting_Agenda__Minutes)
  + Cybersecurity – AAS
    - <http://brazil.minnesota.edu/curr/cybersecurity_AAS_fall2019.pdf>
    - Outcome Review
  + Information Technology – AS
    - <http://brazil.minnesota.edu/curr/IT_AS_fall2017.pdf>
    - Outcome Review
    - Survey Link for the meeting
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  + Cybersecurity – Certificate
    - <http://brazil.minnesota.edu/curr/cybersecurity_certificate_fall2019.pdf>
    - Outcome Review
  + Cisco Certificate
    - <http://brazil.minnesota.edu/curr/cisco_fall2012.pdf>
    - Cisco Academy curriculum change
* Course and Program Plan Review
  + Note: MState recommends advisory committee setup a rotating schedule for reviewing course and program plans..
* Program Needs
  + Partnerships
  + Equipment
  + Recruitment
  + This is a call for Internships and entry-level job opportunities for M State students.
* College update
* Other
* Next Meeting Date

Actions Items

Advisory Member Functions (MSCTC Advisory Committee Guide)

* Identify specific subject areas of program inclusion
* Prioritizing the recommend subject areas
* Specifying appropriate program content level
* Reviewing program outcomes on an ongoing basis
* Assessment of program quality
* Specifying appropriate foundational skill standards for local needs
* Identifying general education and related technical skills needed by graduates
* Recommending equipment to support the program content

ACM Curricula Recommendations

* + IT2017 Essential Only Domains
    - Information Management
      * Tools and techniques for efficient data modeling, collection, organization, retrieval, and management
      * How to extract information from data to make data meaningful to the organization.3.How to develop, deploy, manage and integrate data and information systems to support the organization.
      * Safety and security issues associated with data and information.
      * Tools and techniques for producing useful knowledge from information
    - Integrated Systems Technology
      * Scripting languages, their uses and architectures
      * Application programming interfaces
      * Programming practices to facilitate the management, integration and security of the systems that support an organization
    - Platform Technologies
      * Comparison of various operating systems available, including their respective characteristics, advantages and disadvantages
      * Selection, deployment, integration and administration of platforms or components to support the organization’s IT infrastructure
      * Fundamentals of hardware and software and how they integrate to form the essential components of IT systems
    - System Paradigms
      * Skills and tools to gather requirements, source code development, evaluation and integration of components into a single system, and system validation
      * Design, selection, application, deployment, and management of computing systems to support an organization
      * Skills and concepts essential to the administration of operating systems, networks, software, file systems, file servers, web systems, database systems, and system documentation, policies, and procedures
      * Fundamentals of project management and the interplay between IT applications and related organizational processes
      * System integration issues, including integration in a system of systems and federation of systems, role of architectures in systems integration, performance and effectiveness
      * Education and support of users of computing systems
    - User Experience Design
      * Understanding of advocacy for the user in the development of IT applications and systems
      * Development of a mind-set that recognizes the importance of users, context of use, and organizational contexts
      * Employment of user-centered methodologies in the design, development, evaluation, and deployment of IT applications and systems4.Application of evaluation criteria, benchmarks, and standards
      * User and task analysis, human factors, ergonomics, accessibility standards, experience design, and cognitive psychology
  + IT2017 Essential +Supplemental
    - Cybersecurity Principles / Cybersecurity Emerging Challenges
      * A computing-based discipline involving technology, people, information, and processes to enable assured operations
      * A focus on implementation, operation, analysis, and testing of the security of computing technologies
      * Recognition of the interdisciplinary nature of the application of cybersecurity including aspects of law, policy, human factors, ethics, and risk management in the context of adversaries
      * The practice of assuring information and managing risks related to the use, processing, storage, and transmission of information or data and the systems and processes used for those purposes.
      * Measures that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation
      * The emerging challenges in a computing-based discipline involving technology, people, information, and processes to enable assured operations and to support the growing need for forensic activities in a contest, adversarial environment
      * Security considerations of cloud computing
      * Digital forensics including the recovery and investigation of material found in digital devices, often in relation to computer crime.
      * Security implications for information technologies enabled and controlled by software and influenced by the supply chain
    - Global Professional Practice / Social Responsibility
      * Importance of identifying and understanding essential skills required for a successful career within the industry, including professional oral and written communication skills.
      * Identification of ways teamwork integrates throughout IT and ways IT supports an organization
      * Social and professional contexts of information technology and computing, and adherence to ethical codes of conduct
      * Social, governmental regulations and environmental context of IT and computing
      * Importance of Team Dynamics, Ethics and Professionalism to an organizations success
      * Information Technology and the role of Risk Management
      * Energy Management and Standards leading to “Green Computing”
    - Networking / Applied Networks
      * Topology of ad hoc and fixed networks of all sizes
      * Role of the layered model in standards evolution and interoperability
      * Physical layer through routing layer issues
      * Higher layers related to applications and security, such as functions and design
      * Approaches to designing for and modeling latency, throughput, and error rate
      * Purpose and role of proprietary network protocols, and comparing proprietary networks with open standard protocols
      * Protocols and languages in network programming; socket-based network application programs design and implementations
      * Components of Voice over IP (VoIP) networks and protocols, and configurations of voice gateways for supporting calls using various signaling protocols
      * Scientific field routing and protocols in the internet, IPv6 and the internet protocol of the future
      * Basic mobile network architectures and protocols used in wireless communications
    - Software Fundamentals / Software Development and Management
      * Skills and fundamental programming concepts, data structures, and algorithmic processes
      * Programming strategies and practices for efficient problem solving
      * Programming paradigms to solve a variety of programming problems
      * Software process models and software project management
      * Software development phases: requirements and analysis, design and construction, testing, deployment, operations, and maintenance
      * Modern software development and management platforms, tools, and services
    - Web and Mobile Systems / Mobile Applications
      * Web-based applications including related software, databases, interfaces, and digital media
      * Mobile applications including related software, databases, interfaces, and digital media
      * Contemporary web technologies, social media
      * Mobile application technologies with experiences to create mobile applications
      * Mobile architectures, including iOS and Android
      * Creation of mobile applications on different platforms
      * Evaluation and performance improvement of mobile applications
      * Designing friendly interfaces for mobile applications
  + IT2017 Supplemental Only
    - Cloud Computing
      * Cloud computing paradigm
      * Cloud computing fundamentals, security principles, and applications
      * Theoretical, technical, and commercial aspects of cloud computing
      * Architecture and cloud software development
      * Emerging technologies and existing cloud-based infrastructure
    - Data Scalability and Analytics
      * Key technologies used in collecting, cleaning, manipulating, storing, analyzing visualizing, and extracting useful information from large and diverse data sets
      * Data mining and machine learning algorithms for analyzing large sets of structured and unstructured data
      * The challenges of large scale data analytics in different application domains
    - Internet of Things
      * Basic knowledge and skills to engage in innovative design and development of IoT solutions
      * Trends and characteristics in the IoT field
      * Analysis of challenges and application patterns for user-interaction in IoT settings
      * IoT effects for signal processing, data acquisition, and wireless sensor networks
      * Relationships between IoT and intelligent information processing
      * Internet operations compared with internet of things operations
    - Virtual Systems and Services
      * Virtualization and its related open source components
      * Deployment skills to build virtualization and clustered solutions
      * Networked storage for virtualization infrastructure needs
  + URL
    - <https://www.acm.org/binaries/content/assets/education/curricula-recommendations/csec2017.pdf>
  + CSEC2017 Knowledge Units
    - Data Security
      * Basic cryptography concepts
      * Digital forensics
      * End-to-end secure communications
      * Data integrity and authentication
      * Information storage security
    - Software Security
      * Fundamental design principles including least privilege, open design, and abstraction,
      * Security requirements and their role in design,
      * Implementation issues,
      * Static and dynamic testing,
      * Configuring and patching, and
      * Ethics, especially in development, testing and vulnerability disclosure
    - Component Security
      * Vulnerabilities of system components,
      * Component lifecycle,
      * Secure component design principles,
      * Supply chain management security,
      * Security testing, and
      * Reverse engineering
    - Connection Security
      * Systems, architecture, models, and standards,
      * Physical component interfaces,
      * Software component interfaces,
      * Connection attacks, and
      * Transmission attacks.
    - System Security
      * Holistic approach,
      * Security policy,
      * Authentication,
      * Access control,
      * Monitoring,
      * Recovery,
      * Testing, and
      * Documentation
    - Human Security
      * Identity management,
      * Social engineering,
      * Awareness and understanding,
      * Social behavioral privacy and security, and
      * Personal data privacy and security
    - Organizational Security
      * Risk management,
      * Governance and policy,
      * Laws, ethics, and compliance, and
      * Strategy and planning
    - Societal Security
      * Cybercrime,
      * Cyber law,
      * Cyber ethics,
      * Cyber policy and
      * Privacy
    - URL
      * <https://www.acm.org/binaries/content/assets/education/curricula-recommendations/csec2017.pdf>