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Biomedical Informatics (BMI)

MS/PhD Program in Biomedical Informatics

James McClay, MS, MD, FACEP
Associate Professor, Emergency Medicine
Chair, Biomedical Informatics Graduate Program
Biomedical Informatics (BMI)

“the interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving, and decision making, motivated by efforts to improve human health.”

*American Medical Informatics Association*
BMI Competencies

Span the spectrum from molecules to populations

Involve theories, methods, and processes for management of biomedical knowledge

Build upon computing, communications and information sciences in biomedicine

Draw upon social and behavioral sciences to translate biomedical discovery into use
The Approved Proposal for BMI Degree

Consolidate multiple informatics programs and research initiatives

Create a combined, joint Masters and Doctoral degree program in biomedical informatics at the University of Nebraska

Be jointly administered at UNMC and UNO.

Involve interested faculty from UNO, UNMC and UNL
Motivation

Core competencies published, program accreditation standards under development

BMI education and competency is a core component of NIH Translational Science Strategy

Increasing need to attract top students and researchers
Value to University and State

National demand for manpower in this area

University of Nebraska poised to join premier institutions in the field

Increase competitiveness for faculty, students and funding

Fills a regional need for BMI education.
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Research IT Office

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Overview

Research IT Office (RITO) is a new core facility on the UNMC campus. It is established to meet the growing information technology needs of the research community. RITO works closely with UNMC “ITS” and other College/departmental IT units to fulfill information technology needs of the researcher community.
Scope

RITO serves all UNMC colleges (College of Medicine, College of Pharmacy, College of Dentistry, College of Public Health, and College of Nursing), Eppley Institute, Munroe-Meyer Institute, and School of Allied Health Professions.

Collaborate with the research community to develop proposals for the National Strategic Research Institute (NSRI).
Infrastructure

Collaborate with UNMC ITS to establish Enterprise Infrastructure for research

Help in choosing hardware, software, commercial tools and open source tools for research projects

Facilitate Server and software upgrades and ensure server resources are located in the Data Center
Application Development and Programming

Design, build and maintain research applications (including Client / Server web development) for the conduct of a wide range of research activities

Provide consultation on research applications and activities including feasibility, budget, planning, implementation, and maintenance including equipment installations

Provide direction in using the computational analysis facilities at Holland Computer Center (HCC) and Prairie Fire

Develop middleware to interface with research laboratory instrumentation
Data Management and Data Storage

Implement Data Management practices including Data Storage, Retrieval, Archival, Purging and Planning

Create and maintain research databases

Work with investigators to follow data management policies and procedures that meet research specific regulatory and contractual requirements
Data Management and Data Storage (cont)

Work with NSRI project personnel in developing and implementing task orders. Provide direction and support for technical related activities (data storage, data security, backup, data transmission and access)

Coordinate data stewardship for large research files that need to be moved from machine to machine
Information Security and Privacy

Collaborate with the Information Security Office and the Compliance Office to implement research specific regulatory and contractual requirements.

Review Information Security policies and procedures and identify the impact of those policies and procedures to the research community.

Help researchers to understand Information Security and Privacy policies and procedures.
Research Grants

Develop and submit budget required to accomplish or support technical parts of grant applications applicable to research information technology, such as NIH Shared Instrument Grants (SIG), Nebraska Research Initiative (NRI) or other investigator-driven grants.

Provide pre-proposal and post-award support for research grants
General Support

Provide IT support for Biobank and Freezer Works

Design and implement efficient, and cost-effective solutions as a research core facility
Core Facility

• Part of movement to Electronic Health Record
• UNMC Clinical Research Center
• Electronic Health Record Core Facility

http://www.unmc.edu/cctr/ehr_services.htm

- Dr. Purnima Guda, EHR Core Director
Electronic Health Record Core Facility

The major services of this core facility are data acquisition and retrieval for clinical and translational research. This may include:

- feasibility studies
- cross-sectional studies
- health outcomes
- retrospective data analysis
- quality improvement projects
- transfer of datasets to a registry
- case finding for subject recruitment
- public health research
Microsoft Cloud Services

Microsoft has signed a Business Associate Agreement

Office 365

• AD integration
• Lync in the Cloud
• Sharepoint in the Cloud

Azure

Long Term Direction
Mobile Device Management

Facilities piloting an MDM

• Cisco Meraki (http://www.meraki.com/)

Operational issues relating to ipads will be presented to Financial Stewardship in May

• Note: Apple applications may NOT be purchased via UNL.

• Work group composed of Accounting, Procurement and ITS working to develop procedures
Security Procedures Under Review

End User Device
Traveling with Electronic Devices
Use of Handheld/Mobile Devices
Life Cycle Management of Smart Phones
Presentation to Financial Stewardship regarding ipads
International Visitors

New policy effective May 1, 2013

Approved at Chancellor’s Council

“Neither photo id badges nor access to UNMC computer system will be granted without the approval of the International Health and Medical Education (IHME) office”

All requests for accounts must be submitted by IHME.

IHME
BSC 3032, Zip 5700
(402) 559-6414
Information Security Incident Response

Seeing increase in incidents

Evaluated process

Formed “Red Team”

• Sharon Welna
• Harry Wines
• Lisa Bazis
• Brian Prell, (UNMC P)
• Tom Brooks (TNMC/BMC)
Obama Cybersecurity Executive Order

**Improving Critical Infrastructure Cyber security**

Assigns the National Institute of Standards and Technology (NIST) the development of a cybersecurity framework

NIST will work with all Federal Agencies

- Department of Health and Human Services (HHS)
- Department of Homeland Security (DHS)
- NIH
- FDA, etc.
What does that mean to UNMC?

Education

1. Department of Education

Research

1. Federally funded research
   • 68.5% of research on this campus is federally funded

Patient Care

1. Department of Health and Human Services
2. FDA
Timeline (Order issued February 12, 2013)

Within 240 days of the date of this order, the Director shall publish a preliminary version of the Cybersecurity Framework (the "preliminary Framework"). Within 1 year of the date of this order, and after coordination with the Secretary [DHS] to ensure suitability under section 8 of this order, the Director shall publish a final version of the Cybersecurity Framework (the "final Framework").
Current Recommendations

UNMC has previously selected NIST as our security framework

Adopt cybersecurity best practices as outlined in the [SANS 20](https://www.sans.org) and the [Verizon Data Breach Investigations Report](https://www.verizonenterprise.com/data-breach-investigations-report),
What is SANS?

The SANS Institute was established in 1989 as a cooperative research and education organization. At the heart of SANS are the many security practitioners in varied global organizations from corporations to universities working together to help the entire information security community.

SANS is the most trusted and by far the largest source for information security training and security certification in the world. It also develops, maintains, and makes available at no cost, the largest collection of research documents about various aspects of information security, and it operates the Internet's early warning system - the Internet Storm Center.
What is SANS Top 20?

In 2008, the Office of the Secretary of Defense asked the National Security Agency for help in prioritizing the myriad security controls that were available for cybersecurity. The request went to NSA because NSA best understood how cyber attacks worked and which attacks were used most frequently. The request came at a moment when the theme "offense must inform defense" had become a White House mantra for cybersecurity.
SANS Top 20 adoption

Fall of 2008, Center for Strategic and International Studies

2009, U.S. Department of State

December of 2011, Department Homeland Security

December 2011, the United Kingdom's Centre for the Protection of National Infrastructure (CPNI)

June 2012, the Idaho National Laboratory, home of the National SCADA Test Bed, of the U.S. Department of Energy
UNMC activities

Prepare gap assessment of UNMC security practices to SANS 20 Critical Controls
Currently focusing on information provided by the vulnerability scanner which assists in validating that the patching tool is working properly
Evaluating our incident response process
Industry Best Practices

SANS 20 Critical Security Controls

• Control 4: Continuous Vulnerability Assessment and Remediation

Tools Used

• Symantec Vulnerability Management

Associated NIST Special Publication 800-53, Revision 3, Priority 1 Controls

1. RA-3 (a, b, c, d), RA-5 (a, b, 1, 2, 5, 6)

Associated NSA Manageable Network Plan Milestones and Network Security Tasks

1. Milestone 6: Patch Management
Questions??