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## SENATE COMMITTEE ON CURRICULAR AFFAIRS

### Course Submission and Consultation Form

Principal Faculty Member Proposing Course: **Brian Cameron**

College: **INFORMATION SCIENCES AND TECHNOLOGY**

Department or Instructional Area: **INFORMATION SCIENCES AND TECHNOLOGY**

College/Academic Unit With Curriculum Responsibility: **INFORMATION SCIENCES AND TECHNOLOGY**

Type of Proposal:  Add  Change  Drop

Type of Review:  Full  Expedited

(See [Guide to Curricular Procedure](#) for definitions of a full or expedited review.)

Course Designation: **(IST 423) Enterprise Information Management and Storage Architecture**

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#### Special categories for Undergraduate (001-499) courses

Current listings for existing courses are in **bold** type. Proposed changes are indicated by the checkboxes.

- Writing/Speaking (GWS)
  - Quantification (GQ)
  - Health and Physical Activity (GHA)
  - Natural Sciences (GN)
  - Arts (GA)
  - Humanities (GH)
  - Social and Behavioral Sciences (GS)
  - Honors (H)
  - Writing-Intensive Permanent (WF)
  - Writing-Intensive One Semester (WFV)
  - United States Cultures (US)
  - International Cultures (IL)
  - Bachelor of Arts (BA)**
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#### Proposed Bulletin Listing

Abbreviation: **IST**

Number: **423**

Title: **Enterprise Information Management and Storage Architecture**

Abbreviated Title: **ENT INFO MGMT ARCH**

Credits: **Min: 3 Max: 3**

Repeatable: **No**

Description: **Provide in-depth study of the concepts, issues, and technologies associated with the complex world of enterprise information and storage architecture.**

Prerequisites: **IST 301**

Concurrent Courses:

Cross Listings:

Does this course have a travel component: **No**

#### Course Outline

A brief outline or overview of the course content

**This course is designed to introduce students to enterprise information storage architecture design, development, and management as well as current issues, trends, and technologies. The course will mix technical details, applied value, and organizational insights of enterprise information storage architecture through the use of labs, case studies, real-life problems, and team projects. Many aspects of information security are covered throughout the course.**

A listing of the major topics to be covered with an approximate length of time allotted for their discussion

- **Understanding the Enterprise Information Architecture Landscape (1 week)**

- o **The Value of Information**
- o **Business Needs**
- o **Trends and Opportunities**
- o **Applications and Markets**
- o **The Information management Value Proposition**

- **Information Management Architectures (2 weeks)**

- o **Direct-Attached Storage (DAS)**
- o **Network-Attached Storage (NAS)**
- o **Storage Area Networks (SAN)**
- o **SAN Topologies**
- o **Comparing Solutions**
- o **Organizations and Standards**

- **Fibre Channel Technology (2 weeks)**

- o **What is Fibre Channel**
- o **Fibre Channel Terminology**
- o **Fibre Channel Architecture**
- o **The Future of Fibre Channel**

- **Emerging Storage Networking Alternatives to Fibre Channel (2 weeks)**

- o **Fibre Channel Issues**
- o **Storage over IP**
- o **InfiniBand**

- **Information Management Applications (2 weeks)**

- o **Server Clustering**
- o **High-Availability Configurations**
- o **Fault Tolerant Options**
- o **Disaster Recovery Planning**

- **Storage Management (2 weeks)**

- o **Device Management**
- o **Network Management**
- o **Storage Resource Management (SRM)**
- o **Enterprise Management**
- o **Heirarchical Storage Management (HSM)**

- **Information Management Maintenance and Optimization (2 weeks)**

- o **Revision Level Upgrades**
- o **Monitoring**
- o **Performance Tuning**
- o **Identification of Performance Bottlenecks**
- o **Optimizing Backup and Recovery**

- **The Future of Information Architecture (2 weeks)**

- o **Foundation Technologies Roadmap**
- o **Interoperability Issues**
- o **Emerging Technologies**
- o **Storage and Infrastructure as a Service**

## o Future Trends

A brief (up to 400 words) description of the course

**This course is designed to introduce students to enterprise information storage and management concepts, issues, trends, and technologies. As a junior/senior level course, the focus will center on applying design concepts and associated technologies to real-world problems in the area of enterprise information storage and management . Existing partnerships with leading information management firms will be leveraged to provide real-world exposure to the complex enterprise information storage and management issues facing all organizations today. This course also focuses increasingly on the critical areas of information security and the emerging field of information storage virtualization. The course will mix technical details, applied value, and organizational insights of enterprise information storage and management through the use of labs, case studies, real-life problems, and team projects. This is a unique course that has generated great industry interest.**

The name(s) of the faculty member(s) responsible for the development of the course

**Brian Cameron, Senior Lecturer, College of Information Sciences and Technology**

### Justification Statement

Instructional, Educational, and Course Objectives

**According to CIO magazine, information storage and management issues are consistently mentioned as top concerns of CIOs globally. Professionals that understand enterprise information storage and management issues and technologies and can participate in enterprise-wide decision making are highly valued assets in all organizations today. According to a 2008 article by IDC, the world is now creating more information that it has the capability to store and manage. As a result, spending on information storage and management related technologies and professionals is now approaching fifty percent of the IT budget in many organizations today. However, as a recent article by EMC exemplifies, finding information management and storage professions with the requisite knowledge and enterprise perspective is very challenging today.**

**This course responds to these challenges and opportunities by presenting an enterprise perspective on information storage and management and provides a variety of concepts, tools, and real-world applications designed to provide the students with unique perspectives and insights needed to understand and develop solutions to complex information storage and management issues.**

Instructional, Educational, and Course Objectives:

Upon completion of the course, the students will be able to:

- Understand the value of information storage and management today
- Identify business needs that information management addresses
- Realize the storage networking value proposition
- Apply contemporary concepts and technologies
- Use design considerations and approaches for information management architectures
- Evaluate strengths and limitations of high-availability topologies
- Apply design considerations for disaster recovery and fault tolerance
- Realize interoperability issues
- Understand standards issues
- Apply security issues, concepts, and technologies related to information management
- Realize the importance and role of virtualization
- Think critically: the ability to identify and summarize key issues of enterprise information storage and management, draw conclusions and implications, make recommendations, and present them in a clear and concise manner.

**Course materials: Information Storage and Management: Storing, Managing, and Protecting Digital Information. EMC Education Services. 2009**

Readings provided by instructor

### **POSSIBLE READINGS**

**IT Priorities in 2008: A truly new year, SearchDataCenter.com,**

[http://searchdatacenter.techtarget.com/news/article/0,289142,sid80\\_gci1293983,00.html](http://searchdatacenter.techtarget.com/news/article/0,289142,sid80_gci1293983,00.html)

Gartner White Paper, "Gartner Defines Enterprise Information Architecture", February, 2008

IDC White Paper, "The Diverse and Exploding Digital Universe," March 2008.

Proceedings of the Americas Conference on Information Systems, "Enterprise Systems Education: New Challenges and Directions", August 2008.

EMC White Paper, "Managing Information Storage: Trend, Challenges and Options", January 2008.

CIO Magazine Article, "Enterprise Information Management a Priority for CIOs, But Elusive", July 2007.

Datamonitor White Paper, "Information lifecycle management: A discipline, not a product", March 2007

#### Evaluation Methods

This course will incorporate team-based study and development emphasizing team presentation and project demonstrations. Projects will incorporate experiences wherever appropriate. Emphasis will be placed on developing and practicing writing and speaking skills through application of the concepts that define the course.

Four methods will be incorporated to grade students and these include class participation (10%), exams (2 x 10% = 20%), individual labs (2 x 10% - 20%), team research paper (20%), team project-presentation (10%), and team design project (20%).

#### Relationship/Linkage of Course to Other Courses

**Prerequisite: IST 301, Information and Organizations**

#### Relationship of Course to Major, Option, Minor, or General Education

This course is closely related to the integration and application option within the IST curriculum. Effective information storage and management is increasingly a central concern in enterprise integration initiatives. IST 423 is one of the required courses in the proposed Enterprise Architecture Support of Option. The course is also closely related to the SRA major. Secure information storage and management is a prime concern for all organizations today. This course could also serve as an elective course in the SRA major.

#### A description of any special facilities

Computers are required to allow the student to work on assigned labs.

**Diagramming Software: Visio or case tool such as Visible Analyst is recommended**


#### Frequency of Offering and Enrollment


**Enrollment at University Park will be approximately 35-40 students per offering. Once per academic year.**

**Effective Date: Spring 2013**


#### Consultation Summary/Response:

Course proposal was sent via e-mail to all IST faculty at UP, presented at the 9/13/12 faculty meeting, and an e-vote was sent following faculty meeting. All responses (faculty majority) received were to approve course.

 = Concur/Approval

 = Pending Suggested Changes

 = Non-Concur/Rejected

 = Awaiting Review

(#) = Review Order

## Formal Consultation

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**Name:** [Anthony D'Augelli \(HHD\)](#)

**Position:** Faculty Consultant

**Title:** ASSOCIATE DEAN

**Department:** HEALTH & HUMAN DEV

**Campus:** UNIVERSITY PARK CAMPUS



**Concur:** Yes

**Comments:**

**Reviewed On:** 11/1/2012 2:42:00 PM

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**Name:** [Nancy Herron \(University College\)](#)

**Position:** Faculty Consultant

**Title:** ASSOC DEAN FOR ACAD PROGM

**Department:** VP COMMONWEALTH CAMPUSES

**Campus:** UNIVERSITY PARK CAMPUS



**Concur:** Yes

**Comments:**

**Reviewed On:** 11/1/2012 4:13:00 PM

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**Name:** [H. Nels Shirer \(EMS\)](#)

**Position:** Faculty Consultant

**Title:** ASSOCIATE DEAN FOR EDUCATION

**Department:** EARTH AND MINERAL SCIENCES  
ADMINISTRATION

**Campus:** UNIVERSITY PARK CAMPUS



**Concur:** Yes

**Comments:**

**Reviewed On:** 11/2/2012 9:45:00 AM

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**Name:** [Mary Beth Williams \(Sci\)](#)

**Position:** Faculty Consultant

**Title:** ASSOC DEAN, UGRAD EDU

**Department:** SCIENCE - EBERLY COLLEGE

**Campus:** UNIVERSITY PARK CAMPUS



**Concur:** Yes

**Comments:**

**Reviewed On:** 11/3/2012 2:24:00 PM

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**Name:** [Norah Shultz \(Abington\)](#)

**Position:** Faculty Consultant

**Title:** ASSOC DEAN ACADEMIC AFFAI

**Department:** DIR OF ACADEMIC AFFAIRS

**Campus:** ABINGTON CAMPUS



**Concur:** Yes

**Comments:**

**Reviewed On:** 11/5/2012 5:51:00 PM

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**Name:** [Kenneth Womack \(Altoona\)](#)

**Position:** Faculty Consultant

**Title:** ASC. DEAN OF ACADEMIC AFF

**Department:** DIVISION OF ARTS & HUMANITIES

**Campus:** ALTOONA CAMPUS




**Concur:** Yes


**Comments:**

Reviewed On: 11/7/2012 4:39:00 PM


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**Name:** [Christopher Long \(LibArts\)](#) **Department:** LIBERAL ARTS ADMINISTRATION  
**Position:** Faculty Consultant **Campus:** UNIVERSITY PARK CAMPUS  
**Title:** ASSOC DEAN FOR UG STUDIES  
 **Concur:** Yes  
**Comments:**  
**Reviewed On:** 11/12/2012 12:15:00 PM


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**Name:** [Marie Hardin \(Comm\)](#) **Department:** JOURNALISM  
**Position:** Faculty Consultant **Campus:** UNIVERSITY PARK CAMPUS  
**Title:** ASSOC PROF COMMUNICATION  
 **Concur:** Yes  
**Comments:**  
**Reviewed On:** 11/14/2012 10:37:00 AM


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**Name:** [Augustus Colangelo \(Smeal\)](#) **Department:** UNDERGRAD PROG IN BA  
**Position:** Faculty Consultant **Campus:** UNIVERSITY PARK CAMPUS  
**Title:** ASSOC DEAN UNDERGRAD PROG  
 **Concur:** Yes  
**Comments:**  
**Reviewed On:** 11/15/2012 4:23:00 PM


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**Name:** [Omid Ansary \(Harrisburg\)](#) **Department:** (Not Available)  
**Position:** Faculty Consultant **Campus:** (Not Available)  
**Title:** (Not Available)  
 **Concur:** Yes  
**Comments:** (Approved By Default - Exceeded Two Week Time Limit)  
**Reviewed On:** 11/16/2012 2:50:00 AM

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**Name:** [Paul Esqueda \(Berks\)](#) **Department:** (Not Available)  
**Position:** Faculty Consultant **Campus:** (Not Available)  
**Title:** (Not Available)  
 **Concur:** Yes  
**Comments:** (Approved By Default - Exceeded Two Week Time Limit)  
**Reviewed On:** 11/16/2012 2:50:00 AM

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**Name:** [Renata Engel \(Engr\)](#) **Department:** (Not Available)  
**Position:** Faculty Consultant **Campus:** (Not Available)  
**Title:** (Not Available)  
 **Concur:** Yes  
**Comments:** (Approved By Default - Exceeded Two Week Time Limit)  
**Reviewed On:** 11/16/2012 2:50:00 AM


## Required Signatories

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**Name:** [Mary Beth Rosson](#)  
**Position:** Head of Department  
**Title:** PROFESSOR INFO SCI & TEC  
 **Concur:** Yes  
**Comments:**  
**Reviewed On:** 11/26/2012 8:06:00 AM

**Department:** INFO SCIENCES & TECH  
**Campus:** UNIVERSITY PARK CAMPUS

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**Name:** [Prasenjit Mitra](#)  
**Position:** College Representative  
**Title:** ASSOC PROF IST  
 **Concur:** Pending The Following Action By The Initiator  
**Comments:** The syllabus is a bit hotch-potch.

**Department:** INFO SCIENCES & TECH  
**Campus:** UNIVERSITY PARK CAMPUS


1. The description talks about security in at least two places whereas the topics never mention security. Do we need topics on security?
2. The title mentions storage but maybe there is more networking topics than storage topics. For example, there are two modules on fibre channels and not much on storage and disks, etc. Maybe remove storage from the title or adapt the topics.
3. In today's world, we need some discussion of cloud computing and virtual machines. While these are touched upon, they are not explicitly mentioned in the topics. Should we do that?

These are not deal-breakers, but, I think these suggestions should make the course better. I could be convinced to change my opinion, but, I thought I would bring these up.

**Reviewed On:** 12/13/2012 12:57:00 PM

**Response:** On 1/3/2013 10:33:11 AM [CINDY LOU BIERLY](#) **Responded:** Prasenjit Mitra and Brian Cameron met to discuss. Brian Cameron's response is as follows: 1. Many aspects of information security are covered throughout the course. A sentence was added to the course description to make this clear. 2. Storage and disk concepts are covered in several areas of the course. The section on Direct Attached Storage covers these topics in the most detail. 3. Yes, under future trends Storage and Infrastructure as a Service has been added

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**Name:** [Irene Petrick](#)  
**Position:** College Representative  
**Title:** SENIOR LECTURER  
 **Concur:** Yes  
**Comments:**  
**Reviewed On:** 1/9/2013 3:22:00 PM

**Department:** INFO SCIENCES & TECH  
**Campus:** UNIVERSITY PARK CAMPUS

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**Name:** [Michael McNeese](#)  
**Position:** Dean of the College  
**Title:** Associate Dean / PROF IST/PSYCHOLOGY

**Department:** INFORMATION SCIENCES AND TECHNOLOGY  
**Campus:** UNIVERSITY PARK CAMPUS



**Concur:**Yes

**Comments:**

**Reviewed On:** 1/14/2013 8:39:00 AM

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**Name:** [\[Name Not Specified\] - USERID: kkw2](#)

**Department:**

**Position:** Faculty Senate

**Campus:**

**Title:**



**Concur:**Yes

**Comments:** This course has been approved.

**Reviewed On:** 4/10/2013 3:19:00 PM

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**Senate Curriculum Report ID**

IST 423 : **41-05-125**

Approval Date: 3/22/2013 12:00:00 AM

Curriculum Report Date: 2/19/2013 12:00:00 AM

ProposalID: 17668

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