Information Systems Engineering & Management (ISEM)

*Graduate Studies in **Smart Digital Enterprises** with focus on Digital Transformation*

Overview

The Information Systems Engineering and Management (ISEM) Program concentrates on the planning, engineering/re-engineering and management of Smart Digital Enterprises. ISEM supports the large number of Digital Transformation Initiatives that are being launched in the public and private sectors around the globe. As displayed in Figure 1, a diverse array of digital technology, cyber-physical, security and management components need to be planned, engineered and managed to support the existing and future enterprises and initiatives. Examples -- shown on the top layer of Figure1 -- are Smart Cities and Communities, Industry4.0 and Manufacturing4.0 enterprises, Digital Health networks, Agricultural Technologies to fight hunger, Energy and Environment improvements for day-to-day survival, Disaster and Pandemic Resilience, Autonomous Transportation and many more. ISEM core courses focus on planning, engineering and management; electives allow students to specialize in different topic areas dislayed in Figure1. Students can specialize in smart cities and enterprises, digital transformation, technology management, AI for business, Techpreneurship, next generation technologies and others.
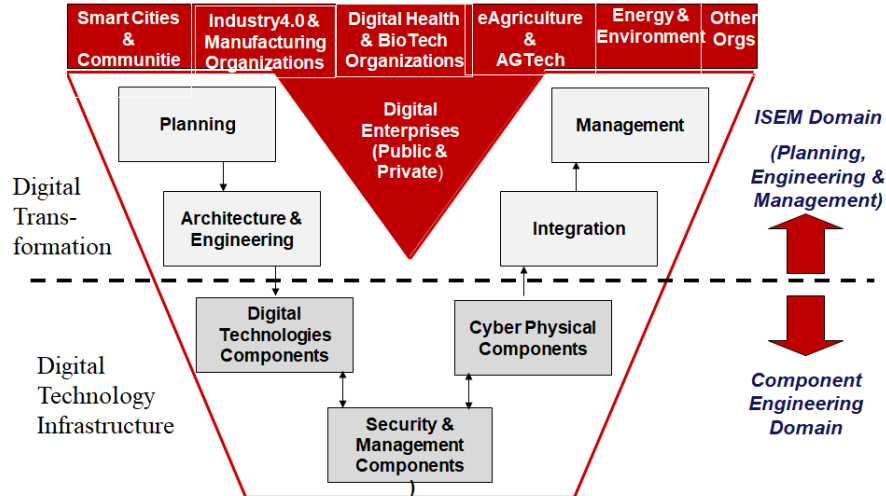

Figure1: How the Digital Technologies are Enabling Multiple Public and Private Sectors
(Based on: International Council on Systems Engineering - InCOSE)

The following courses comprise the Master of Science in ISEM (36 semester hours):

- Five Core Required Courses (15 semester hours)
- Five Elective Courses (15 semester hours) from any Graduate Programs at HU
- Two Capstone Courses (6 semester hours)

IMPORTANT: Please review the documents in Stage1 before proceeding

Specializations and Individualized Concentration

The Master of Science in Information Systems Engineering and Management student can choose courses totaling 15 semester hours of credit from any of the graduate programs at HU. Although ISEM students can take any courses from any graduate program, they are encouraged to choose electives that focus on their professional area of interest. In addition, ISEM students are expected to use the concepts learned in these electives to strengthen their capstone courses.

This option allows the ISEM students to specialize in areas displayed in Table1. In other words, the transcript of an ISEM graduate and the Capstone topic defines the concentration and not a pre-specified rigid list of courses.

Capstone Study

Capstone study (6 semester hours of research thesis or practical project) is a unique characteristic of the Graduate programs at Harrisburg University. The 6 semester hours of work concludes the Master's degree and helps the student to synthesize their knowledge and gain further insights through research investigation or practical exploration. The student has to take GRAD 695 (Research Methodology and Writing) before enrolling in ISEM 699 (Applied Project in ISEM) or GRAD 699 (Graduate Thesis). Additional information can be found in the ISEM Capstone Guide. .

Table1: ISEM Areas of Specializations/Concentrations and the Possible Career Paths Supported

ISEM Specializations and/or Concentrations
(DEFAULT) Smart Digital Enterprises: take ISEM572 or ISEM558 and at least 6 semester hours from (ISEM503, ISEM565, ISEM530) & using smart enterprise concepts in Capstone.
Technology Management in the Digital Age: take ISEM547 (IT Management), 2 courses in MGMT and use Technology Management concepts in Capstone.
Techpreneurship (ENTP): take 9 semester hours in ENTP & Capstone in ENTP or choose the ENTP Concentration
Next Generation Technologies (Blockchains and Quantum Information Science): take least 9 semester hours in QIS/BC and Capstone in NGT
AI and BI for Business: take at least 9 semester hours in AI/BI (e.g., ISEM503, ISEM565, ISEM761) and use AI/BI concepts in ISEM Capstone. or choose the NGT Concentration
Digital IT Infrastructure (IoTs, 5G): take at least 9 semester hours in Digital Infrastructure (DI) -- e.g., ISEM534, ISEM536. ISEM555, ISEM558 -- and use DI concepts in Capstone
Analytics, Project Management, and CISC Focus: take 3 courses from any of these programs and using any of these concepts in ISEM Capstone (thus having a double major).
Build Your Own (BYO): Almost unlimited number of highly creative Specializations by combining any graduate course work in ISEM shown in Exhibit1 with any other HU courses to meet the changing needs of modern digital enterprises. For example, a student can take two courses in digital health, one in security, one in analytics, and one in entrepreneurship to launch a unique company in health. Other examples of possible area of focus are Cyber Security, Management of Integration Projects, Digital Health, or any other topic area by taking 3 courses in those topics & a related Capstone.

Pre-Registration Guidelines

Figure 2 shows a simple ISEM Course Planning Decision Tree that will help you to take appropriate courses in your first semester, middle semesters, and the last two semesters. This decision tree will help you to develop your Course Plan.
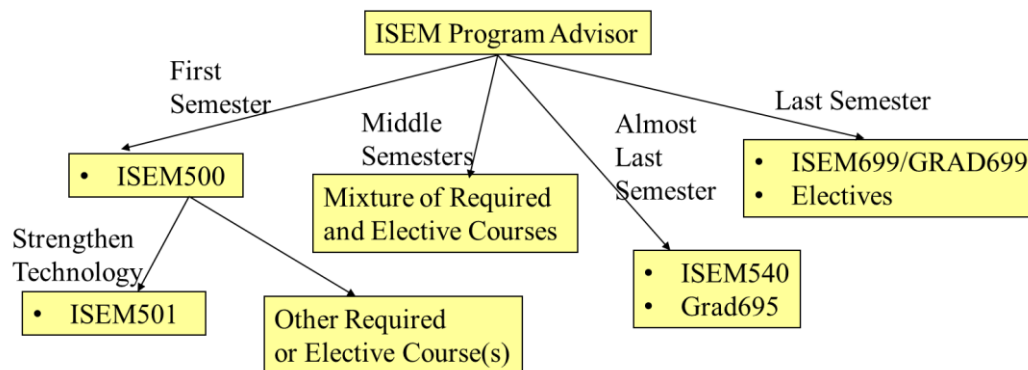

Figure2: ISEM Course Planning Decision Tree

IMPORTANT: You cannot take Grad695 and Grad699/ISEM699 in the same semester.

Course Delivery Formats at Harrisburg University Graduate School

- Traditional Model
    - 42 hours of instruction in class
    - Typically delivered in 3 hour sessions (14 sessions)
- Executive Model (Hybrid)
    - 12 hours of instruction in class
    - Delivered over 3 Saturdays (1 day in beginning, 1 day in middle, 1 day at the end of semester)
    - Asynchronous instructions, assignments, and discussion forums
    - Online synchronous discussion sessions (1-2 hour per week)
- Online Model
    - No in-class sessions
    - Asynchronous instructions, assignments, discussion forums
    - Online synchronous discussion sessions (1-2 hour per week)
- For CPT Students:
    - Only one course can be online
    - All other courses have to be in Executive format

IMPORTANT NOTES:
- Executive (Hybrid) courses are indicated by section numbers 50, 51, 52, 53, 54, etc (e.g., ISEM500-50) and Online courses are indicated by section numbers 90, 91, 92, 93, etc (e.g., ISEM501-92)
- All courses (executive or online) require 6-8 hours per week of Studies

Important Suggestions and Guidelines:

- You cannot take more than one online course in a semester
- Please take as many required courses as quickly as possible so that you can graduate at your scheduled times. Exhibit1 shows the list of required courses
- In the last two semesters, you must take Capstone Courses (Grad695 and ISEM699/Grad699). IMPORTANT: You cannot take Grad695 and Grad699/ISEM699 in the same semester.
- To help you plan your courses better, we are offering several sections of ISEM required courses

Important eMail Addresses: For quick response to your questions, please use the following email addresses instead of sending emails to one person who may be too busy or away from work:

- Helpdesk@Harrisburgu.edu: for General IT and Moodle Support
- Registrar@Harrisburgu.edu: for questions related to registration, drop-adds, transfer credits, etc
- ISEMinfo@harrisburgu.edu: for questions related to the ISEM Program

ATTACHMENT A: ISEM COURSE PLANNING GUIDELINES

As discussed previously, the ISEM program is based on the following 5 Required Courses:
- ISEM 500 (IS Planning, Engg & Mgmt Principles) is the first required course of ISEM. Students with deficiencies in IT must take ICTT501 (ICT Principles)

Two courses from the Management Track:
- MGMT 510 (Business Strategy & Management Principles)
- At least one course from the following list: MGMT 511, or PMGT510, or ANLY500

Two courses from the Technology Track:
- At least one Technology course from the following list: ISEM 502 , or ISEM530 or ISEM565 or CISC520 or LTMS 531
- ISEM 540: Architecture & Integration of Enterprises

In addition, you must take two Capstone courses: GRAD695, GRAD699, ISEM699

Suggested Study Plan: As shown in Figure 2, you can use the following overall study plan (see next section for detailed planning worksheets):
- Take ISEM500 in the first semester plus any other courses you want
- Take other ISEM and Elective courses in any sequence you want (it is better to finish off as many required courses as soon as possible)
- In the last 2 semesters, the students usually take ISEM540, Grad695, and Grad699/ISEM699.

ATTACHMENT A: ISEM COURSE PLANNING WORKSHEET

Student Name: _____ .

Sample Planning Worksheets: Please modify these worksheets to develop a Plan of study. Please use it to discuss your plan of study with your advisor.

Worksheet for 6 Semester Planning (a typical and common model)

SEMESTER 1	SEMESTER 4
• ISEM 500: IS Planning, Engg & Mgmt Principles (E) • ISEM 501: Information & Communication Technologies (E) Or • MGMT 510: Business Strategy & Management Principles (E) Or • MGMT 511 Digital and Global Organizations (M) or PMGT510 (E)or ANLY500 (E)	<u>Electives</u>
SEMESTER 2 • ISEM 502: User Centered Design (F) or ISEM530 (F) or ISEM565 (E) or CISC510 (F) or LTMS 531 (?) <u>Other Electives (If Needed)</u>	**SEMESTER 5** • ISEM 540: Architecture & Integration of Enterprises (E) – Note: Should be taken towards the end. • GRAD 695: Research Methods and Writing (E)
SEMESTER 3 <u>Electives</u>	**SEMESTER 6** • GRAD699/ISEM 699: Applied Project or Thesis (E) • Electives

Worksheet for 3 Semester Planning (Full Time Model – Fast Track)

SEMESTER 1	SEMESTER 2	SEMESTER 3
• ISEM 500: IS Planning, Engg & Mgmt Principles (E) • ISEM 501: Information & Communication Technologies (E) or elective • MGMT 511 Digital & Global Organizations (M) or PMGT510 (E)or ANLY500 (E) • ISEM 502: User Centered Design (F) or ISEM530 (F) or ISEM565 (E) or CISC510 (F) or LTMS 531 (?)	• MGMT 510: Business Strategy & Management (E) • ISEM 540: Architecture & Integration of Enterprises (E) – Note: Should be taken towards the end. • GRAD 695: Research Methods and Writing (E) • Electives	• GRAD699/ISEM 699: Applied Project or Thesis (E) • Elective1 • Elective2 • Elective3