COURSE COUNSELING

(FOR YEARS 3 & 4 IN 2019-20)

Department of Information Engineering

April 15, 2019

OUTLINE

- IERG & MIEG Curricula
  - Major required & IE elective courses
- New IE courses
- IE courses offered in 2019-20
- IE Streams of Specialization
- Discussion on some courses
- Q&A

ENGG YEAR 1 MAJOR CORE

Semester 1

- MATH1510
  Calculus
- PHYS1110/1003
  Engineering Physics I
- ENGG1100
  Engineering Design Lab

Semester 2

- ENGG1410
  Engineering Mathematics I
- ENGG1110
  Problem Solving by Programming

One more Faculty Science Course:

Chemistry Courses: CHEM1380

Life Science Courses: LSCI1001, 1003

Physics Courses: PHYS1110, ENGG1310

Other Courses: CSCI1120, CSCI1130

IERG/MIEG YEAR 2 MAJOR REQUIRED

Semester 3

- ENGG2420 (ENGG2440)
  Complex Numbers, Differential Equations & Discrete Mathematics
- IERG2080 (2 units)
  Intro. To System Programming
- IERG2051 (IERG only)
  Signals and Systems
- IERG2060
  Basic Analog and Digital Circuits
- IERG1810
  Electronic Circuits Laboratory
- MATH1050
  Foundations of Modern Mathematics
- MATH2010
  Advanced Calculus I

Semester 4

- ENGG2470 (ENGG2430)
  Probability for Engineers
- IERG2602 (1 unit)
  Engineering Practicum
- CSCI2100
- Data Structure
- ENGG2310
  Principles of Communication Systems
- IERG3820
  Communication Laboratory
- IERG2051
  Signals and Systems
- MATH2020
  Advanced Calculus II

FACULTY **IERG** **MIEG** (additional)

IERG/MIEG YEAR 3 MAJOR REQUIRED

Semester 5

- IERG3310
  Computer Networks
- IERG3800 (1 unit)
  Information Infrastructure Design Lab
- IERG3080
  Software Engineering and Practices
- MATH2050
  Algebraic Structures
- MATH2230
  Complex Variables with Applications

Semester 6

- IERG3060 (IERG only)
  Microcontrollers and Embedded Systems
- IERG3810 (IERG only)
  Microcontrollers and Embedded Systems Laboratory
- MATH2040
  Linear Algebra II
- ENGG2310
- IERG3820

If not yet taken in semester 4

(IERG3060 & IERG3810 are elective courses for MIEG)

IERG **MIEG** (additional)

IERG/MIEG YEAR 4 MAJOR CORE

Semester 7

- CSCI3160
  Design & Analysis of Algorithms
- IERG4998
  Final Year Project I

Semester 8

- IERG4999
  Final Year Project II

- **Two-semester Final Year Project (FYP)**
- **Project selection in April for next academic year**
- **Professor suggested topics**
- **Student proposed topics**
- **Poster presentations in December and May**

MAJOR ELECTIVES

- IERG: at least 17 units
  - At least 12 units from IE Major Elective List
  - The rest (5 units) can be either from IE Major Elective List or from 3000-coded courses from all other programmes under Engineering Faculty
- MIEG: at least 12 units from the given MIEG major elective lists.

IE MAJOR ELECTIVES

- **At least 17 units of IERG Major Electives**
- **At least 12 units from List of IE Major Electives**

CSCI 3150	**Introduction to Operating Systems**
ENGG 1820	**Engineering Internship**
IERG 3010	**Digital Communications**
IERG 3050	**Simulation and Statistical Analysis**
IERG 3280	**Networks: Technology, Economics, and Social Interactions**
IERG 3300	**Introduction to Stochastic Processes**
IERG 3320	**Social Media and Human Information Interaction**
IERG 3830	**Product Design Project**
IERG 4030	**Optical Communications**
IERG 4080	**Building Scalable Internet-based Services**
IERG 4090	**Network Protocols and Systems**
IERG 4100	**Wireless Communication Systems**

IE MAJOR ELECTIVES

- **IERG 4110** Hands-on Wireless Communications
- **IERG 4130** Introduction to Cyber Security
- **IERG 4160** Image and Video Processing
- **IERG 4180** Network Software Design and Programming
- **IERG 4190** Multimedia Coding and Processing
- **IERG 4210** Web Programming and Security
- **IERG 4220** Secure Software Engineering
- **IERG 4230** Introduction to Internet of Things
- **IERG 4300** Web and Information Analytics
- **IERG 4330** Programming Big Data Systems
- **IERG 4340** Emerging Technologies in IE
- **IERG 4350** Cloud Computing Security
- **IERG 4831** Networking Laboratory I
- **IERG 4841** Networking Laboratory II

IE MAJOR ELECTIVES

IERG 5020 Telecommunication Switching and Network Systems
IERG 5090 Advanced Networking Protocols and Systems
IERG 5100 Advanced Wireless Communications
IERG 5130 Probabilistic Models and Inference Algorithms for Machine Learning
IERG 5140 Lightwave Networks
IERG 5154 Information Theory
IERG 5200 Channel Coding and Modulation
IERG 5230 Algorithms and Realization of Internet of Things Systems
IERG 5240 Applied Cryptography
IERG 5270 Advanced Topics in P2P Networks and Systems
IERG 5280 Mobile Networking
IERG 5290 Network Coding Theory
IERG 5300 Random Processes for Engineers
IERG 5310 Security & Privacy in Cyber Systems
IERG 5320 Digital Forensics
IERG 5330 Network Economics
IERG 5340 IT Innovation and Entrepreneurship
IERG 5590 Advances in Blockchains

MAJOR ELECTIVES FOR MIEG

- **At least 12 units of MIEG Major Electives (Lists A & B), AND**
- **At least 9 units from List A**

A. CSCI2110 (or MATH3250), CSCI3130, 3150, 3230, 3320, 5320 (or MATH3260), ENGG1820, IERG3010/ESTR3300, IERG3050, 3060, IERG3280/ESTR3302, IERG3300/ESTR3304 (or MATH4240), IERG3320/ESTR3306, IERG3810, 3830, 4030, IERG4080/ ESTR4312, IERG4090/ESTR4302, IERG4100/ESTR4304, IERG4110/ESTR4314, IERG4130/ESTR4306, IERG4160, IERG4180/ESTR4308, IERG4190, 4210, 4220, 4230, IERG4300/ESTR4300[*ENGG4030], IERG4330/ESTR4316, IERG4340, IERG4831, 4841, 5020, IERG5040/ENGG5392, IERG5090, IERG5100/ENGG5303, IERG5130, 5140, IERG5154/ENGG5301, IERG5200 (or MATH4260), IERG5230, IERG5240/ENGG5383, IERG5270, 5280, 5290, IERG5300/ENGG5302, IERG5310, 5320, 5330, 5340, 5590,

B. MATH2060, 2070, 3010, 3030, 3040, 3070, 3080, 3093, 3215, 3230, 3270, 3290, 3310, 3320, 3330, 3360, 4010, 4020, 4030, 4230, 4280

NEW IE COURSES

IERG 4340 Emerging Technologies in IE

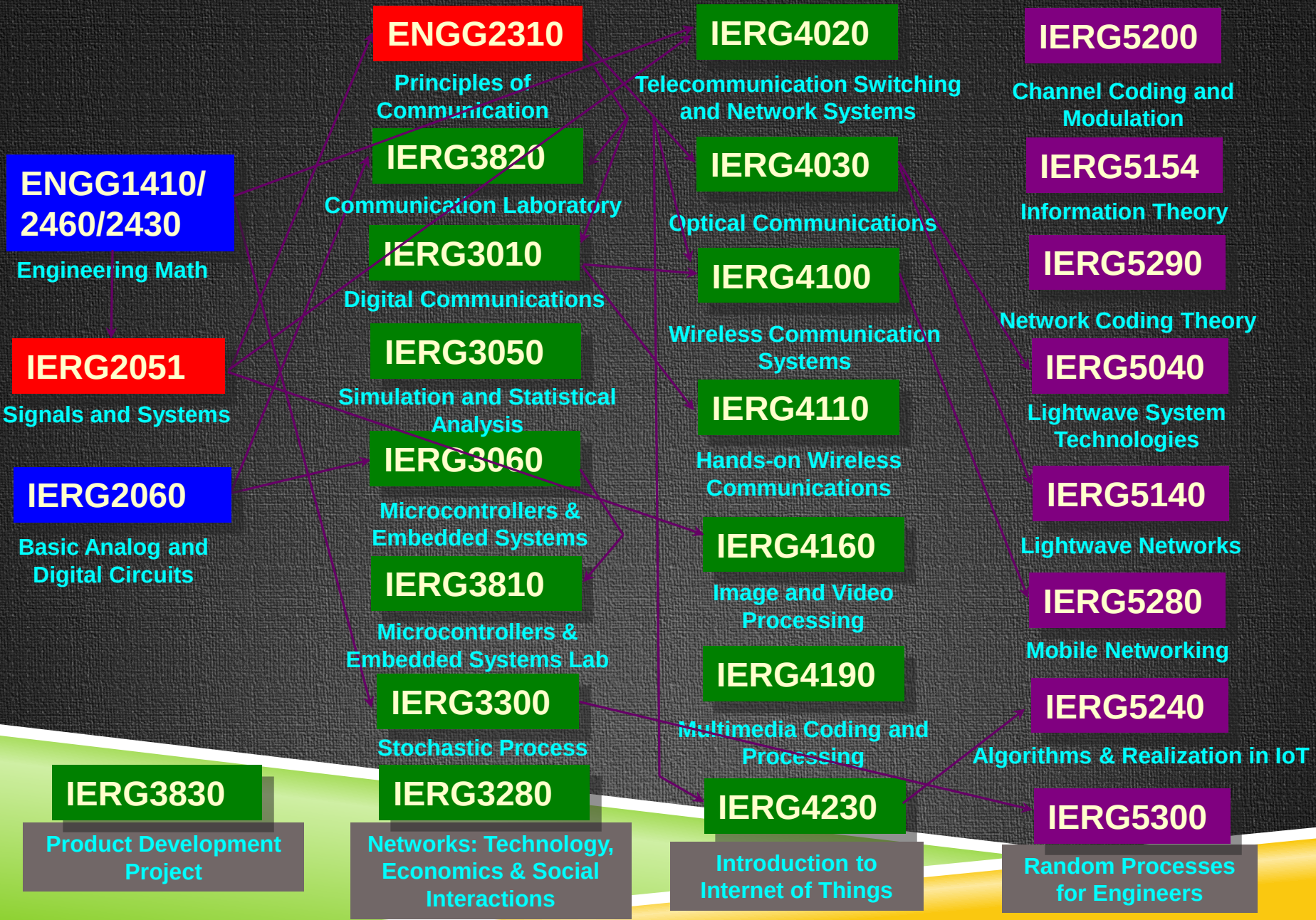
This course introduces emerging technologies in telecommunications and internet engineering. These new technologies are discussed and compared with conventional ones in terms of market demand, system requirements, design principles, applications, limitations and their impacts to society. The topics include telecommunication network infrastructure, advanced optical metro/access networks and wireless LTE technologies, fiber-wireless convergence, cloud/edge computing, software defined networking, network function virtualization, data center networking, smart automation systems, etc. The topics may vary. Case studies.

IERG 4350 Cloud Computing Security

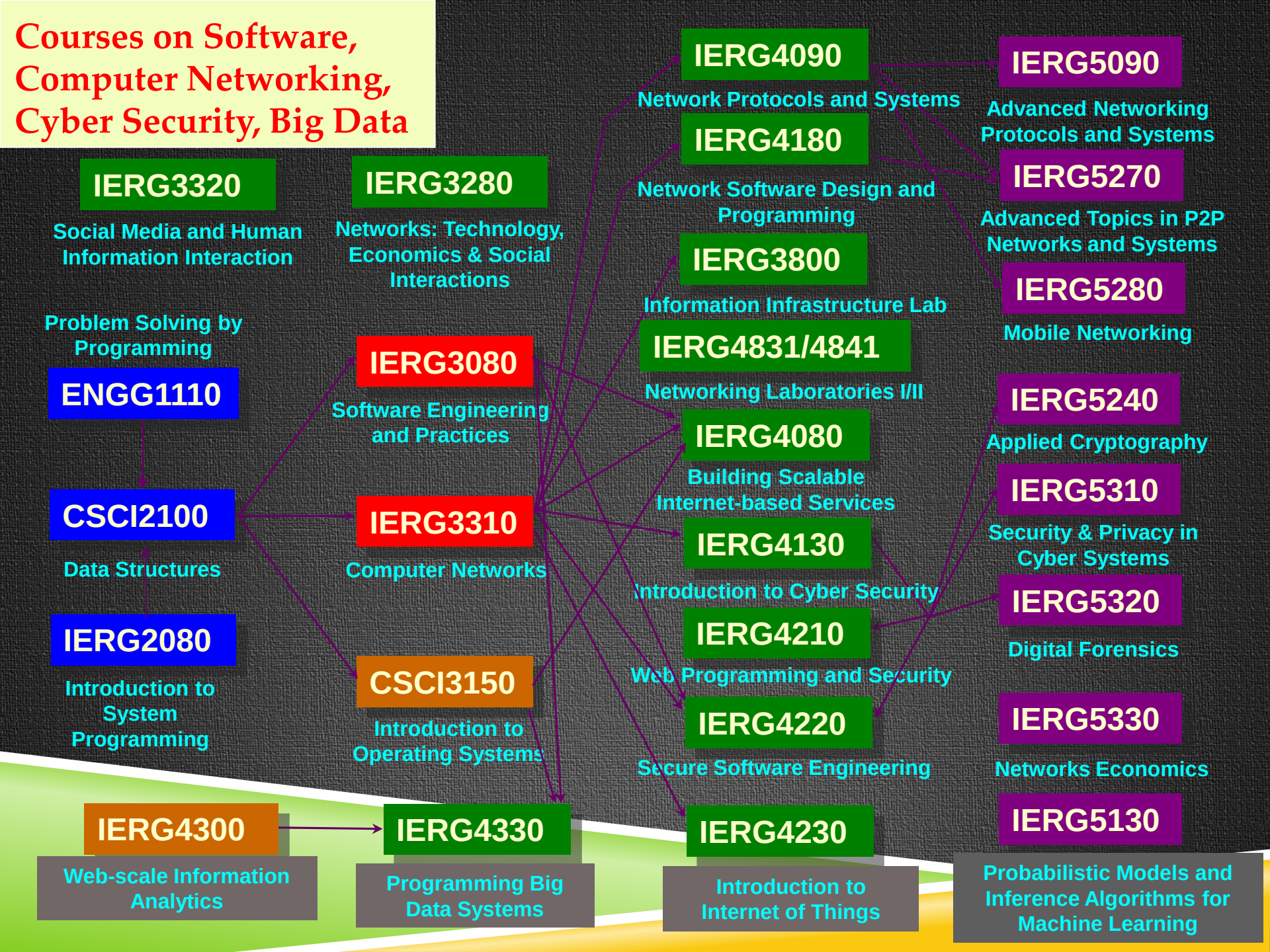
The course aims to address the security issues in cloud computing so as to assure a secure and efficient cloud environment for dynamic business environment. The discussion includes the basics of cloud computing environment and its common threats and attacks, analysis of security architecture in various cloud services model and deployment model, various software-based security tools to monitor and protect the flow of information into and out of the cloud, identity and access management, patch management, data security controls and requirement, etc. The lectures are supplemented by substantial practical security implementation work and application development.

FTEC 4004 - E-payment Systems and Cryptocurrency Technologies

Courses on Telecommunications and Information Processing



Courses on Software, Computer Networking, Cyber Security, Big Data



IE MAJOR REQUIRED & ELECTIVES TO BE OFFERED IN 2019-20

First Semester

- IERG3010
- IERG3050
- IERG3320
- IERG4030
- IERG4100
- IERG4210
- IERG4230
- IERG4300
- IERG4350
- IERG4831
- IERG4841
- IERG6120
- IERG6300
- IERG5020
- IERG5310
- ENGG5301
- ENGG5303
- IERG1810
- IERG2051
- IERG2080
- IERG2060
- IERG3080
- IERG3310
- IERG3800

Second Semester

- IERG3280
- IERG3300
- IERG3830
- IERG4090
- IERG4130
- IERG4160
- IERG4190
- IERG4220
- IERG4340
- IERG4831
- IERG4841
- CSCI3150
- IERG5200
- IERG5590
- CSCI2100
- ENGG2310
- IERG2051
- IERG2602
- IERG3060
- IERG3310
- IERG3800
- IERG3810
- IERG3820
- IERG6120
- IERG6130

IE STREAMS OF SPECIALIZATION

- **Communications**
- **Internet Engineering**
- **Cyber Security**
- **Enrichment**
- **Big Data: Systems and Applications**

- On voluntary basis.
- To qualify for a stream of specialization, the student must complete at least 12 units from the electives listed under the stream.
- A student who satisfies all the requirements of a stream of specialization may obtain a letter of certification from the department.

IE STREAMS OF SPECIALIZATION

Communications

IERG 3010	Digital Communications
IERG 3280	Networks: Technology, Economics, and Social Interactions
IERG 3300	Introduction to Stochastic Processes
IERG 4030	Optical Communications
IERG 4100	Wireless Communication Systems
IERG 4110	Hands-on Wireless Communications
IERG 4130	Introduction to Cyber Security
IERG 4230	Introduction to Internet of Things
IERG 4340	Emerging Technologies in IE
IERG 5020	Telecommunication Switching and Network Systems
IERG 5040	Lightwave System Technologies (ENGG5392)
IERG 5100	Advanced Wireless Communications (ENGG5303)
IERG 5200	Channel Coding and Modulation
IERG 5280	Mobile Networking
IERG 5230	Algorithms and Realization of Internet of Things Systems
IERG 5330	Network Economics

IE STREAMS OF SPECIALIZATION

Internet Engineering

CSCI 3150	Introduction to Operating Systems (Required)
IERG 3050	Simulation and Statistical Analysis
IERG 3280	Networks: Technology, Economics, and Social Interactions
IERG 3300	Introduction to Stochastic Processes
IERG 4080	Building Scalable Internet-based Services
IERG 4090	Network Protocols and Systems
IERG 4130	Introduction to Cyber Security
IERG 4180	Network Software Design and Programming
IERG 4190	Multimedia Coding and Processing
IERG 4210	Web Programming and Security
IERG 4831	Networking Laboratory I
IERG 4841	Networking Laboratory II
IERG 5090	Advanced Networking Protocols and Systems
IERG 5270	Advanced Topics in P2P Networks and Systems
IERG 5280	Mobile Networking

IE STREAMS OF SPECIALIZATION

Cyber Security

CSCI 3150	Introduction to Operating Systems
IERG 4130	Introduction to Cyber Security (Required)
IERG 4210	Web Programming and Security
IERG 4220	Secure Software Engineering
IERG 4350	Cloud Computing Security
IERG 5240	Applied Cryptography (ENGG5383)
IERG 5310	Security & Privacy in Cyber Systems
IERG 5320	Digital Forensics
IERG 5590	Advances in Blockchains

IE STREAMS OF SPECIALIZATION

Enrichment

IERG 3010	Digital Communications
IERG 3050	Simulation and Statistical Analysis
IERG 3280	Networks: Technology, Economics, and Social Interactions
IERG 3300	Introduction to Stochastic Processes
IERG 4100	Wireless Communication Systems
IERG 4190	Multimedia Coding and Processing
IERG 4300	Web and Information Analytics
IERG 5154	Information Theory (ENGG5301)
IERG 5200	Channel Coding and Modulation
IERG 5270	Advanced Topics in P2P Networks and Systems
IERG 5290	Network Coding Theory
IERG 5300	Random Processes for Engineers (ENGG5302)

IE STREAMS OF SPECIALIZATION

Big Data: Systems and Applications

IERG 3320	Social Media and Human Information Interaction
IERG 4080	Building Scalable Internet-Based Services
IERG 4160	Image and Video Processing
IERG 4230	Introduction to Internet of Things
IERG 4300	Web-scale Information Analytics (Required)
IERG 4330	Programming Big Data Systems
IERG 5130	Probabilistic Models and Inference Algorithms for Machine Learning
CSCI 3320	Fundamental of Machine Learning
CSCI 4180	Introduction to Cloud Computing and Storage
CSCI 4190	Introduction to Social Networks
ELEG 5491	Introduction to Deep Learning

ELITE (ENGINEERING LEADERSHIP, INNOVATION, TECHNOLOGY AND ENTREPRENEURSHIP) STREAM

- Elective Courses:
- 15 units of courses:
  - (i) 12 units of ESTR courses of which at most 6 units of courses at 1000 or 2000 level and at least 6 units of courses at 3000 or 4000 level
  - (ii) 3 units of BMEG/CENG/CSCI/ELEG/ENGG/IERG/MAEG/SEEM courses at 5000 level

Q & A