About MIEG programme

MIEG Programme

Jointly offered by the Faculty of Science and Faculty of Engineering

Managed by

- Department of Mathematics (Faculty of Science)
- Department of Information Engineering (Faculty of Engineering)

Curriculum:

- Higher level math courses: along with math majors (rigorous treatment)
- Engineering Courses: mainly with IERG and some with CSCI students

Admission to this programme

- Enrichment Math students: Faculty of Science
- Broadbased students: Faculty of Engineering
About MIEG programme

MATHEMATICS
- Analysis
- Calculus
- Differential Equations

INFORMATION SCIENCE
- Discrete Math
- Probability
- Algorithms
- Signal Processing
- Communications
- Machine Learning
- Big Data
- Software Engineering
- Networking
- Cyber Security
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Information Science
- Machine Learning
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- Software Engineering
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- Cyber Security

Objectives:
1. Acquire Analytical Problem Solving Skills
2. Ability to develop Innovative and Creative Solutions
3. Attain Solid Foundation for Research
What does the curriculum look like?

Mathematics + Information Engineering

Major Requirement including Faculty Package (84 units)

| Year 1 | Engineering Faculty Package or Enrichment Mathematics Study Scheme  
plus Extra Foundation Courses |
|--------|-------------------------------------------------------------------|
| Year 2 | Foundation of Modern Math · Advanced Calculus  
Data Structures · Basic Analog & Digital Circuits  
Electronic Circuit Design Lab · Probability Models & Applications  
Principles of Communication Systems · Communications Lab  
Intro to Systems Programming · Engineering Practicum  
Fourier Analysis · Discrete Structures and Probability |
| Year 3 | Linear Algebra II · Algebraic Stuctures · Mathematical Analysis I  
Complex Variables with Applications  
Information & Software Engg Practice · Computer Networks  
Information Infrastructure Design Lab  
plus Major Elective Courses |
| Year 4 | Final Year Project I and Final Year Project II  
Design and Analysis of Algorithms  
plus Major Elective Courses |

Wide Range of Electives

Web-scale Information Analytics  
Programming Big Data Systems  
Probabilistic Models & Inference Algorithms for Machine Learning  
Internet of Things  
Building Scalable Internet-based Services  
Social Media & Human Info Interaction  
Multimedia Coding and Processing  
Simulation & Statistical Analysis  
Digital Communication  
Reinforcement Learning  
Advanced Topics in Blockchain  
Applied Cryptography  
Digital Forensics  
Random Processes  
Network Economics  
Graph Theory  
Numerical Analysis  
Linear Programming  
Mathematical Modeling  
and MORE!

*Plus University Core Requirement, including English Language, Chinese Language, General Education, Physical Education & IT Training.*
What are some of the areas you can specialize in?

A wide range of major electives allow you to specialize in

- Communications Systems and Computer Networks
- Multimedia (Image and Video) Processing, Machine Learning (Artificial Intelligence)
- Coding and Information Theory
- Theory of Computation
- Data Sciences (Big Data), Optimization
- Formal and Abstract Mathematics
To which graduate programs have some of the alumni gone?

Data (2010 - 2020)

M.S./Ph.D. in Electrical (Information) Engineering


M.S./Ph.D. in Computer Science and Mathematics


M.S./Ph.D. in Finance


Remark

- More than 60 percent of the alumni of this program goes to graduate schools.
- Rest find jobs in a variety of industries like finance, programming, etc.

Li Cheuk Ting
MIEG
18 March 2022
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<table>
<thead>
<tr>
<th>Institution</th>
<th>Programme</th>
<th>No. of Offers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnegie Mellon University</td>
<td>MS in Information Networking</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MS in Computer Vision</td>
<td>1</td>
</tr>
<tr>
<td>Princeton University</td>
<td>PhD in Electrical and Computer Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Columbia University</td>
<td>MS in Computer Science</td>
<td>1</td>
</tr>
<tr>
<td>University of Maryland</td>
<td>PhD in Electrical Engineering</td>
<td>1</td>
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<tr>
<td>University of Illinois Urbana-Champaign</td>
<td>PhD in Computer Science</td>
<td>1</td>
</tr>
<tr>
<td>University of Michigan</td>
<td>PhD in Computer Science and Engineering</td>
<td>1</td>
</tr>
<tr>
<td>University of Chicago</td>
<td>MS in Computational and Applied Mathematics</td>
<td>1</td>
</tr>
<tr>
<td>University of California, San Diego</td>
<td>MS in Computer Science</td>
<td>1</td>
</tr>
<tr>
<td>Georgia Tech</td>
<td>PhD in Computer Science</td>
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<tr>
<td>Purdue University</td>
<td>PhD in Computer Science</td>
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</tr>
<tr>
<td>EPFL</td>
<td>PhD in Computer and Communication Sciences</td>
<td>2</td>
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<tr>
<td>ETH Zurich</td>
<td>MS in Computer Science</td>
<td>1</td>
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<tr>
<td>CUHK</td>
<td>PhD in Information Engineering</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>PhD in Systems Engineering and Engineering Management</td>
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</tr>
<tr>
<td></td>
<td>PhD in Computer Science and Engineering</td>
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The secret behind the numbers

- You reap what you sow
  - In other words, the curriculum is **demanding**
- It is designed for **the top students** (Yearly intake: \(\approx 15\))
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➤ They ran into difficulties in later years
➤ They were not prepared for formal math
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Important: If you are considering this programme, please read:
http://www.mie.cuhk.edu.hk/advice.shtml
Major Admission Scheme for MIEG

Selected MIEG/IERG option in major allocation and selected to be considered for MIEG

Allocated to IERG/MIEG by the Faculty?

Allocated to MIEG (email in 2 days)

Admitted into IERG

Admitted into MIEG

Not in MIEG

Read all about it: http://www.mie.cuhk.edu.hk/mieg_admission.shtml
Preferences on Major Programmes

1. Drag and drop the programmes

<table>
<thead>
<tr>
<th>1st</th>
<th>IERG/MIEG - Information Engineering/Mathematics and Information Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd</td>
<td>SEEM - Systems Engineering and Engineering Management</td>
</tr>
<tr>
<td>3rd</td>
<td>MAEG - Mechanical and Automation Engineering</td>
</tr>
<tr>
<td>4th</td>
<td>CENG - Computer Engineering</td>
</tr>
<tr>
<td>5th</td>
<td>CSCI - Computer Science</td>
</tr>
</tbody>
</table>

2. Regarding the programme choice of IERG/MIEG, my intended major is:

- [ ] IERG
- [x] MIEG

Remember to select MIEG here to indicate your choice

Note:
- If you choose IERG, you will not be considered for MIEG
- If you choose MIEG but did not make it, you will be defaulted to IERG

3. Submit your preferences

Submit
Recap

Ask yourself:

▶ Am I interested in learning fundamentals of information and computer sciences?
Recap

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▶ Am I mathematically inclined?
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- Am I interested in learning fundamentals of information and computer sciences?
- Am I mathematically inclined?
- Do I want to pursue higher studies?
Recap

Ask yourself:

▶ Am I interested in learning fundamentals of information and computer sciences?

▶ Am I mathematically inclined?

▶ Do I want to pursue higher studies?

If the answer to these questions is a resounding **YES**, then MIEG is the right programme for you.

Our advice

Your next step: gather lots of information

► From Alumni

► From Webpage: http://www.mie.cuhk.edu.hk

► From Prof. Chandra Nair, Programme Director (MIEG)
  ● Email: chandra@ie.cuhk.edu.hk
  ● Webpage: http://chandra.ie.cuhk.edu.hk
  ● Office: SHB 811

► From me (send email to make an appointment)
  ● My email: cti@ie.cuhk.edu.hk
  ● My webpage: https://staff.ie.cuhk.edu.hk/~ctli/
  ● My office: SHB 807
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QUESTIONS