REIDS
Renewable Energy Integration Demonstrator - Singapore
An ERI@N Flagship Project
Systems & technologies for a sustainable & affordable energy access-for-all in Southeast Asia
PhD Programme at School of Electrical and Electronic Engineering, NTU
February 2016
## Content Overview

### TOPIC

- PhD Programme Overview
- Programme Structure
- Application Period and Procedures
- Admission Requirements
- Research Areas
- Fees
- Scholarships
- Division of Power Engineering, Staff
- Course Syllabus Example (AY 2015-2016)

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The School of Electrical and Electronic Engineering offers a PhD programme:  
**Doctor of Philosophy (PhD)**

Ph.D. candidates may be admitted as **full-time or part-time students**. The minimum and maximum periods of candidature for both full-time and part-time are as follows:

<table>
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<tr>
<th>Programmes</th>
<th>Full-Time</th>
<th>Part-Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>2 years</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Research scholarships, or financial top-ups (for selected industrial projects only) are available to outstanding candidates.
PhD Thesis
Candidates enrolled for a PhD programme by research pursue an independent but supervised research in an approved topic based on which a thesis must be submitted for examination.

Courses
Candidates are also required to attend a number of graduate level courses and pass the examinations. Candidates are required to attend classes and pass the examinations to earn 18 Academic Units (for e.g. 6 3-AU courses) in PhD study. Candidates have to undergo a Qualifying Examination/Confirmation Exercise within a period stipulated by the school.

Oral examination
Upon the completion of the research, the candidate is required to submit a thesis on his/her research for examination. For the degree of Doctor of Philosophy, there is also an oral examination on the subject matter on his/her thesis and other related subjects.
Application Period

Admission is in August or January each year.

Applicants are required to submit online application via the NTU application portal. Please click here for application and admission details. Any other forms of submission will not be accepted. Applicants are advised to submit applications at least 4 months before their desired intake.

<table>
<thead>
<tr>
<th>Admission</th>
<th>Last day of submission with supporting documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>August Semester</td>
<td>31 January</td>
</tr>
<tr>
<td>January Semester</td>
<td>30 June</td>
</tr>
</tbody>
</table>
General Admission Requirements

• A **Bachelor’s degree with honours of at least a Second Class Upper level** or equivalent

• For international applicants whose mother tongue is not English, a good **TOEFL** score is required. Test dates must be within 2 years or less from the date of your application. **IELTS** can also be used in place of TOEFL.

• International applicants are also required to have **GRE** score. Test dates must be within 5 years or less from the date of your application. Applicants from India may use the Graduate Aptitude Test in Engineering [GATE] score of at least 90% in place of GRE.

You need to attach a photocopy of the TOEFL and GRE test scores to the online application. Official ETS test scores are not required when you are sending in the application.
Applicants are invited to explore their research interests in one of the many research areas, not limiting to the 6 broadly classified research areas listed below.

1. Power Engineering
2. Circuits and Systems
3. Information Engineering
4. Control and Instrumentation
5. Communication Engineering
6. Microelectronics

Please note that PhD topics have to be coordinated with the supervising Professor.
Candidates may pursue their research programme at EEE in one of the following research areas:

<table>
<thead>
<tr>
<th>Research Areas at EEE (Details)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clean and Renewable Energy Systems</strong></td>
</tr>
<tr>
<td><strong>Efficient Energy Conversion and Utilization</strong></td>
</tr>
<tr>
<td><strong>Energy Storage Systems</strong></td>
</tr>
<tr>
<td><strong>Intelligent Energy Distribution</strong></td>
</tr>
<tr>
<td><strong>Power Systems and Power Electronics</strong></td>
</tr>
<tr>
<td><strong>3D Packaging, System on Package and Printable Electronics</strong></td>
</tr>
<tr>
<td><strong>Efficient Energy Conversion and Utilization</strong></td>
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<td><strong>Power Systems and Power Electronics</strong></td>
</tr>
<tr>
<td><strong>3D Packaging, System on Package and Printable Electronics</strong></td>
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<tr>
<td><strong>Bio-inspired Integrated Circuits and Systems</strong></td>
</tr>
<tr>
<td><strong>Energy Harvesting and Green Integrated Circuits and systems</strong></td>
</tr>
<tr>
<td><strong>High Speed Signal Integrity Electromagnetic Compatibility and Reliability</strong></td>
</tr>
<tr>
<td><strong>Mm-wave and Terahertz CMOS IC</strong></td>
</tr>
<tr>
<td><strong>Smart Sensors and Advanced Sensing</strong></td>
</tr>
<tr>
<td><strong>Lightwave Communication and Photonics</strong></td>
</tr>
<tr>
<td><strong>Microwave circuits, Radar, Antennas and Propagation</strong></td>
</tr>
<tr>
<td><strong>Modulation, Coding and Signal Processing</strong></td>
</tr>
<tr>
<td><strong>Secure Communication and Networks</strong></td>
</tr>
<tr>
<td><strong>Wireless Networks, Positioning and RFID</strong></td>
</tr>
<tr>
<td><strong>Space Technology</strong></td>
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</tbody>
</table>
Research/Tuition Fees per Academic Year
(Full-time and Part-time AY2015-2016 at EEE in S$):

<table>
<thead>
<tr>
<th></th>
<th>Full Fees</th>
<th>Singapore Citizen</th>
<th>Singapore Permanent Resident</th>
<th>Int. Student with Service Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30,400</td>
<td>7,600</td>
<td>10,650</td>
<td>15,200</td>
</tr>
</tbody>
</table>

There is no application fee for research programmes. Nevertheless, there are eligibility guidelines and various types of fees that you need to know:

1.) Eligibility Guidelines for Ministry of Education (MOE) Subsidy
2.) Service Obligation
3.) Notes on payment of fees
4.) Other fees payable during Matriculation
All scholarships are for full-time studies.

<table>
<thead>
<tr>
<th>Programme</th>
<th>Eligible</th>
<th>Singapore Citizens and Permanent residents</th>
<th>International Applicants</th>
<th>Member countries of ASEAN (except Singapore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nanyang President's Graduate Scholarship</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>NTU Research Scholarship</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Singapore International Graduate Award (SINGA)</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ASEAN Graduate Scholarship</td>
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<td>X</td>
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The Nanyang President's Graduate Scholarship (NPGS) is a competitive and prestigious scholarship scheme designed to encourage outstanding graduates or final-year students to take their first step towards a leading research career by studying for a PhD at NTU.

Who is eligible?
There is no restriction as to the nationality of candidates but all things being equal, preference will be given to Singapore Citizens and Singapore Permanent Residents.

Eligibility criteria
- You must have a First Class Honours degree or equivalent at Bachelor's level
- If you have not yet completed your undergraduate degree programme, you will need to furnish documentation from your university that you are on track to get a First Class Honours degree or equivalent
Who is eligible?

You are eligible for this scholarship if you are a local or international student seeking admission as a full-time candidate pursuing a Doctor of Philosophy (PhD) programme by research at NTU.

Eligibility criteria

• You must have a First Class Honours or Second Class (Upper Division) Honours or its equivalent
• You should not be on paid employment or accept paid employment or concurrently hold any other scholarship, fellowship, bursary or top-up allowance during the prescribed period of the award
The Singapore International Graduate Award (SINGA) is a collaboration between the Agency for Science, Technology & Research (A*STAR), the Nanyang Technological University (NTU), the National University of Singapore (NUS) and the Singapore University of Technology and Design (SUTD).

PhD training will be carried out in English at your chosen lab at A*STAR Research Institutes, NTU, NUS or SUTD. Students will be supervised by distinguished and world-renowned researchers in these labs.

Upon successful completion, students will be conferred a PhD degree by either NTU, NUS or SUTD.
Who is eligible?
This scholarship is open to nationals of member countries of ASEAN* (except Singapore) to pursue a designated full-time Masters degree by coursework and dissertation at NTU.

Eligibility criteria
• Singaporeans and Singapore Permanent Residents are not eligible to apply
• Excellent academic record
• A very good command of the English language
• At least 2 years of working experience
• An acceptable score in the Graduate Management Admission Test (GMAT) – for applicants of the MBA programme
• You should not be on paid employment or accept paid employment or concurrently hold any other scholarship, fellowship, bursary or top-up allowance during the prescribed period of the award

ASEAN or the Association of Southeast Asian Nations consists of Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

Click here for more Info
All scholarships are for full-time studies.

Please check with the sponsors:

- APEC Scholarship
- A*STAR Graduate Scholarship (Open to Singaporeans, Singapore PRs and non-Singaporeans who are eligible and intending to take up Singapore citizenship)
- Economic Development Board Industrial Postgraduate Programme (EDB-IPP)
- EDB Scholarship
- Lee Kuan Yew Scholarship
- Muhammad Ariff Ahmad (MAS) Postgraduate Scholarship
- Nanyang Fellows Scholarship
- Ngee Ann Kongsi Postgraduate Scholarships (Social Sciences)
- NRF EWT Scholarship
- NTU-MBA Scholarship
- Pradap Kow Scholarship
- PSC Masters Scholarship
- SCELSE PhD Scholarship
- SCOR PhD Scholarship
- SMART PhD Scholarship
- Tan Poey Quee NIE Doctor Education (NIE-EdD) Scholarship
- Temasek Life Sciences Laboratory
Associate Professor, Tseng King Jet, Division Head
Professor, Lalit Kumar Goel
Professor, Low Teck Seng
Professor, Wang Youyi
Associate Professor, Ali Iftekhar Maswood
Associate Professor, So Ping Lam
Associate Professor, Wang Peng
Associate Professor, Gooi Hoay Beng
Assistant Professor, Abhisek Ukil
Assistant Professor, Foo Hock Beng, Gilbert
Assistant Professor, Zhao Jiyun
Course Syllabus Example (AY 2015-2016)

- DIGITAL COMMUNICATION SYSTEMS
- COMPUTER NETWORKS
- OPTICAL FIBRE COMMUNICATIONS
- RF CIRCUITS FOR WIRELESS COMMUNICATIONS
- WIRELESS AND MOBILE RADIO SYSTEMS
- ANTENNAS AND PROPAGATION FOR WIRELESS SYSTEMS
- COMPUTER CONTROL SYSTEMS
- SYSTEMS ANALYSIS
- ROBOTICS AND INTELLIGENT SENSORS
- MACHINE VISION
- COMPUTER CONTROL NETWORKS
- PROCESS CONTROL
- ELECTROMAGNETIC COMPATIBILITY DESIGN
- DIGITAL IC DESIGN
- ANALOG IC DESIGN
- ADVANCED DIGITAL SIGNAL PROCESSING
- REAL-TIME DSP DESIGN AND APPLICATIONS
- LASER TECHNOLOGY
- SIGNAL INTEGRITY IN HIGH-SPEED DIGITAL SYSTEMS
- ADVANCES IN NANOELECTRONICS
- DISTRIBUTED MULTIMEDIA SYSTEMS
- DIGITAL AUDIO SIGNAL PROCESSING
- VIDEO SIGNAL PROCESSING
- POWER ELECTRONIC CONVERTERS
- MODERN ELECTRICAL DRIVES
- POWER QUALITY
- RENEWABLE ENERGY SYSTEMS IN SMART GRIDS
- POWER SYSTEM OPERATION AND PLANNING
- POWER SYSTEM MODELLING AND CONTROL
- ADVANCED WAFER PROCESSING
- QUALITY AND RELIABILITY ENGINEERING
- ADVANCED TOPICS IN SEMICONDUCTOR DEVICES
- INTEGRATED CIRCUIT (IC) PACKAGING
- LED LIGHTING AND DISPLAY TECHNOLOGIES
- INTRODUCTION TO INFORMATION & CODING THEORY
- COMPUTATIONAL METHODS IN ENGINEERING
- LINEAR SYSTEMS
- RESEARCH METHODS
- NEURAL AND FUZZY SYSTEMS
- PROBABILITY AND RANDOM PROCESSES
- STATISTICAL SIGNAL PROCESSING
- IMAGE ANALYSIS AND PATTERN RECOGNITION
- ADVANCED SEMICONDUCTOR PHYSICS
- MODERN OPTICS
THANK YOU

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