

APPLICATION GUIDE

International
Energy Science
Course

MASTERS & DOCTORAL
PROGRAM

Academic Year 2020

Admission Cycle II – October intake



Graduate School of Energy Science
Kyoto University

INTERNATIONAL ENERGY SCIENCE COURSE

MASTER'S & DOCTORAL PROGRAM

APPLICATION GUIDE 2020 - ADMISSION CYCLE II, OCTOBER INTAKE

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APPENDIX I: IESC LABORATORY CODE AND KEYWORDS

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Please note that this is a guide to admission in 2020 and should not be used for applications for admission in subsequent years. Applicants for 2021 should contact the GSES Administration Office after October 2020 onward to obtain revised guide and forms.

INTRODUCTION

PROGRAM OVERVIEW

PROGRAM: International Energy Science Course

DEGREE TITLE: Master of Energy Science, Doctor of Energy Science

STANDARD COURSE DURATION: 2 years full time for a Master's; 3 years full time for a doctorate.

LANGUAGE OF INSTRUCTION: English

The International Energy Science Course is an offering from one of Japan's most prestigious universities.

It is specially tailored for international students and those who have been educated outside Japan. A Master's degree is awarded to those who have obtained at least 45 credits, received academic supervision by a faculty member, and successfully defended their Master's thesis in an oral examination. The Doctoral program provides international students and researchers who have a Master's degree an opportunity to further their studies toward a doctoral degree at Kyoto. A doctoral degree is awarded to those who have conducted original academic research receiving scholarly supervision by faculty members and successfully defended their doctoral thesis in an oral examination with minimum 4 credits earned from lectures/seminars.

DEPARTMENTS PROVIDING THE PROGRAM

Students will be enrolled in one of the following four departments* within the Graduate School of Energy Science, depending on their field of interest.

* Admission to the DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY is limited to the Doctoral program.

DEPARTMENT OF SOCIO-ENVIRONMENTAL ENERGY SCIENCE

SES leads research on the effective use of energy and resources and analysis of energy systems in order to build a sustainable social system within the global environment. Core subjects include: introduction to non-carbon energy; engineering in social systems; energy economics; bioenergy; energy environmental impacts; system safety; and energy policy.

DEPARTMENT OF FUNDAMENTAL ENERGY SCIENCE

FES offers fundamental science education and research to contribute to cleaner energy solutions. Core subjects include: chemistry in energy systems; plasma physics; fusion science; and laser-matter interaction.

DEPARTMENT OF ENERGY CONVERSION SCIENCE

ECS conducts education and research on generation, conversion, control and the utilization of various kinds of energy to establish efficient and clean energy systems. Core subjects include: combustion engineering; materials science; fusion and microwave technologies; and plasma physics.

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY

EST conducts education and research on the development of more efficient utilization of direct and indirect energy supplies based on disciplines such as resources, metallurgical, mechanical and electrical engineering. With the aim to establish environmentally friendly process technologies. Core subjects include: materials science; mineral processing; and physics.

Please refer to the website <http://www.energy.kyoto-u.ac.jp/en/> for the prospectus of the Graduate School of Energy Science or for outlines of the respective departments.

ADMISSION CYCLES

The IESC Master's degree program commences in October only, while the doctoral program has two application cycles a year – Cycle I for April enrollment and Cycle II for October enrollment. It is important to apply to the appropriate selection cycle according to the date of your intended enrollment. Offers of admission cannot be deferred to another admission cycle.

| <i>Cycles</i> | <i>Degree</i> | <i>Application deadline</i> | <i>Decision notification</i> | <i>Enrollment</i> | <i>Scheduled degree completion</i> |
|---------------|------------------------------|-----------------------------|------------------------------|------------------------|--|
| Cycle I | Doctoral | July 1, 2019 | September 6, 2019 | April 1, 2020 | March 2023 |
| Cycle II | Master's Doctoral | February 1, 2020 | March 27, 2020 | October 1, 2020 | Master's: September 2022 Doctoral: September 2023 |

MASTER'S PROGRAM

M-II 1. ENROLLMENT CAPACITY

The application process is quite competitive, with a limit of 10 students per academic year for the three departments (Department of Socio-Environmental Energy Science, Department of Fundamental Energy Science, and Department of Energy Conversion Science) for both cycles.

M-II 2. ENROLLMENT DATE

October 1, 2020

M-II 3. ELIGIBILITY REQUIREMENTS FOR APPLICANTS

Eligibility for applicants, as set forth in the General Rules for Kyoto University, is checked prior to selection process.

Applicants must have both of the following qualifications:

- (1) a. Have graduated, or be expected to graduate from a recognized higher education institution outside of Japan with a good bachelor's or higher degree by the official date of enrolment*, or alternatively,
b. Have graduated, or be expected to graduate from a university in Japan by the official date of enrolment* as an overseas student holding a legal status of residence (valid Japan visa).
- (2) Have a competitive proficiency in academic English.

**PLEASE SEE M-II 2*

M-II 4. RECOMMENDED ENGLISH LANGUAGE TEST SCORE

Applicant must supply suitable evidence of English proficiency if he/she is not a national of a majority English speaking country, e.g. Australia, Canada, UK, US and so on, or his/her first language is not English. Recommended scores are 80 or higher for TOEFL iBT, and 6.0 or higher for IELTS.

M-II 5. ADMISSION SELECTION PROCESS AND INTERVIEW

The selection of candidates for admission to the IESC will be conducted through a two-stage process. The process will be as follows:

1) First Screening Stage (documents)

The first stage of screening will be based on evaluation of the documents submitted.

The results will be informed by March 4, 2020 via email.

Candidates who pass the First Screening will be informed and invited to the second stage of screening.

2) Second Screening Stage (interview)

The second stage of screening will be based on an interview (either by Skype or in-person*).

The final admission decision will be judged on the basis of performance in both stages of screening, as well as the availability of student places within the field of proposed study in the department.

Admission results will be notified on March 27, 2020 both by email and post.

*Applicants who live in Japan should attend the in-person interview, while Skype interviews will be arranged for overseas applicants. Overseas applicants are also welcome to attend in-person interviews at Kyoto; however, candidates are individually responsible for any costs involved, as well as for visa arrangements and/or all immigration procedures to attend an on-campus interview.

M-II 6. LABORATORIES/RESEARCH GROUPS

Applicants should specify which laboratories/research groups interest them in terms of their research project on Form A. On acceptance, they will be affiliated with one of these groups and receive academic supervision with their research and thesis. Please note that not all laboratories have the capacity to take new Master's candidates in

Although this degree program does not require specific bachelor's degrees (BSc, BEng, BA, etc.) for admission, some research groups expect students who will receive their academic supervision to have undergraduate-level knowledge and experience in certain academic areas. Please see *Appendix* for availability of student positions and their preferred / required existing knowledge.

M-II 7. DOCUMENTS REQUIRED FOR SCREENING

Forms are available to download at website: <http://www.energy.kyoto-u.ac.jp/en/>

| | | |
|----|--|---|
| 1 | Form A Application | <ul style="list-style-type: none"> - With a passport style photo taken within 3 months must be pasted to the boxed area provided in the application form. - Please do not use a modified photograph. |
| 2 | Form B Personal history | Educational and vocational background |
| 3 | Form C Reference (2) | <ul style="list-style-type: none"> - Form C must be used for recommendation. Submit two recommendation letters on separate Form C's from two referees (academic advisors, tutors etc.) with whom the applicant is well acquainted. - Recommendation letters should be sealed and signed by referees. |
| 4 | Graduation certificate | <ul style="list-style-type: none"> - Only original copies or officially certified duplicates are accepted. - Current students should submit a certificate detailing expected graduation and their most recent official transcripts. |
| 5 | University academic transcripts | <ul style="list-style-type: none"> - English translation must be provided for documents written in any language other than English. |
| 6 | Summary of the graduation thesis/project | <ul style="list-style-type: none"> - Written in English (400 – 500 words) on A4-size paper. - Where no thesis was required, provide a summary of a final year project that required research and analytical skills. - Final year undergraduate students can submit a summary of their major academic assignment or project so far instead of a thesis summary, which is not completed yet. |
| 7 | Statement of purpose | <ul style="list-style-type: none"> - Submit a document describing your motivation and reasons for applying to the Graduate School of Energy Science on A4-size paper in English (400- 500 words). |
| 8 | Official score report of EFL (English as a Foreign Language) test (IELTS/TOEFL) | <ul style="list-style-type: none"> - Applicants whose first language is not English must submit a copy of the official score report of an internationally recognized EFL test. - TOEFL iBT (Internet Based Testing) or IELTS Academic Module are preferred. - Test must have been taken within the last 24 months prior to the date of application deadline. - Test scores are to be sent from the testing agents, e.g. ETS or the British Council, directly to <u>"The Administration Office, Graduate School of Energy Science, Kyoto University.</u> (TOEFL Institution Code: 9501 KYOTO UNIVERSITY, Department Code: 69 PHYSICAL SCIENCES – ENGINEERING, OTHER) by the application deadline. ⁽ⁱ⁾ |
| 9 | Photocopy of passport | Submit a photocopy of the applicant's valid passport showing the photograph page. |
| 10 | Official copy of certificate of residence | <ul style="list-style-type: none"> - Residents of Japan should submit an official copy of their latest residence certificate "Juminhyo" or a photocopy of their resident card (front and back). - Residence certificates are issued at the city/ward office of the registered domicile. |
| 11 | Disclaimer | Please read carefully and sign. |

Note: (i) Applicants should arrange to take the test as early as possible to ensure the timely receipt of the score report. It could take up to eight weeks for us to receive the score from the testing agent.

M-II 8. APPLICATION FEE

10,000 JPY*

**PLEASE SEE G2*

M-II 9. APPLICATION DEADLINES AND TIMETABLE

| | |
|---|---------------------------------|
| Application deadline: | February 1, 2020, 17.00 (UTC+9) |
| Application fee payment: | February 8 - 19, 2020 |
| Results notification of first screening stage | March 4, 2020 |
| Interview period: | March 9 - 13, 2020 |
| Announcement of final results: | March 27, 2020 |
| Enrolment procedures: | May 11 - July 31, 2020 |

DOCTORAL PROGRAM

D-II 1. ENROLLMENT CAPACITY

10 students per academic year for the four departments for both cycles.

D-II 2. ENROLLMENT DATE

October 1, 2020

D-II 3. ELIGIBILITY REQUIREMENTS FOR APPLICANTS

Eligibility for applicants, as set forth in the General Rules for Kyoto University, is checked prior to selection process.

Applicants must have both of the following qualifications:

- (1) a. Have obtained, or be expected to obtain a Master's degree (or equivalent) from a recognized higher education institution outside of Japan by the official date of enrollment*, or alternatively,
b. Have obtained, or be expected to obtain a Master's degree (or equivalent) from a university in Japan as an oversea student holding a legal status of residence (valid Japan visa).
- (2) Have a competitive proficiency in academic English.

**PLEASE SEE D-II 2*

D-II 4. RECOMMENDED ENGLISH LANGUAGE TEST SCORE

Applicant must supply suitable evidence of English proficiency if he/she is not a national of a majority English speaking country, e.g. Australia, Canada, UK, US and so on, or his/her first language is not English. Recommended scores are 80 or higher for TOEFL iBT and 6.0 or higher for IELTS.

D-II 5. ADMISSION SELECTION PROCESS

Applicants are subject to screening based on the application documents and an interview via Skype or in-person, as well as availability of the field of proposed study in the department. Candidates will be contacted directly and briefed on details of the interview.

D-II 6. ACADEMIC SUPERVISOR

Applicants should specify a faculty member under whose supervision they research. Before proceeding with application, applicants MUST contact a prospective academic supervisor in any of four departments to discuss their application and potential research topic.

D-II 7. DOCUMENTS REQUIRED FOR SCREENING

Forms are available to download at website: <http://www.energy.kyoto-u.ac.jp/en/>

| | | |
|----|--|--|
| 1 | Form A Application | <ul style="list-style-type: none"> - With a passport style photo taken within 3 months must be pasted to the boxed area provided in the application form. - Please do not use a modified photograph. |
| 2 | Form B Personal history | Educational and vocational background |
| 3 | Form C References(2) | <ul style="list-style-type: none"> - Form C must be used for recommendation. - Submit two recommendation letters on Form C's from two referees (academic advisors, tutors etc.) with whom the applicant is well acquainted. - Recommendation letters should be sealed and signed by referees. |
| 4 | Degree certificates | <ul style="list-style-type: none"> - Required for both undergraduate/bachelor's and postgraduate/Master's. - Only original copies or officially certified duplicates are accepted. |
| 5 | University academic transcripts | <ul style="list-style-type: none"> - Current students should submit a certificate detailing expected graduation and the recent transcripts available. - English translation must be provided for documents written in any language other than English. |
| 6 | Summary of Master's thesis | <ul style="list-style-type: none"> - Written in English (1000 – 1500 words) on A4-size paper. - Where no thesis was required in your Master's, provide a summary of a final year project that required research and analytical skills. |
| 7 | Research proposal | <ul style="list-style-type: none"> - Submit a research proposal for your doctoral degree on A4-size paper in English (400- 500 words). - Candidates must discuss their research proposal with their prospective supervisor at Kyoto before submission. |
| 8 | Official score report of EFL test (English as a Foreign Language) (IELTS/TOEFL) | <ul style="list-style-type: none"> - Applicants whose first language is not English must submit a copy of the official score report of internationally recognized EFL test. - TOEFL iBT (Internet Based Testing) or IELTS Academic Module are preferred. - Test must have been taken within the last 24 months prior to the date of application deadline. - Test scores are to be sent from the testing agents, e.g. ETS or the British Council, directly to <u>"The Administration Office, Graduate School of Energy Science, Kyoto University.</u> (TOEFL Institution Code: 9501 KYOTO UNIVERSITY, Department Code: 69 PHYSICAL SCIENCES – ENGINEERING, OTHER) by the application deadline. ⁽ⁱ⁾ |
| 9 | Photocopy of passport | Submit a photocopy of the applicant's valid passport showing the photograph page. |
| 10 | Official copy of certificate of residence | <ul style="list-style-type: none"> - Residents of Japan should submit a photocopy of their resident card (front and back). - Residence certificates are issued at the city/ward office of the registered domicile. |
| 11 | Disclaimer | Please read carefully and sign. |

Note: (i) Applicants should arrange to take the test as early as possible to insure the timely receipt of the score report. It could take up to eight weeks for us to receive the score from the testing agent. (ii) Current IESC Master's students wishing to pursue a PhD through the IESC should inquire at the GSES office regarding the procedures to be undertaken.

D-II 8. APPLICATION FEE

10,000 JPY*

***PLEASE SEE G2**

D-II 9. APPLICATION DEADLINES AND TIMETABLE

Contact to a prospective supervisor: Any time before application
 Application deadline: February 1, 2020, 17.00 (UTC+9)
 Application fee payment: February 8 - 19, 2020
 Interview period: March 9 – 13, 2020
 Announcement of final results: March 27, 2020
 Enrolment procedures: May 11 – July 31, 2020

GENERAL INSTRUCTIONS

G1. METHOD OF APPLICATION

Applications are accepted by post or via the online submission system. Applications are NOT accepted in person at the GSES Office.

In the case of post, documents must be sent directly to:

Student Affairs Section, Administration Office
Graduate School of Energy Science, Kyoto University
Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501, JAPAN

In the case of online application, the application can be reached through the website:

(<http://www.energy.kyoto-u.ac.jp/en/>)

Instructions are available on the website.

G2. APPLICATION FEE

Applicants must complete full payment of the application fee during the designated payment period. The application fee is non-refundable.

Please email a scanned certificate of payment from the completed application page in PDF/JPEG to the administration office (intl@energy.kyoto-u.ac.jp) when the payment has been made.

Applicants will be contacted by email in regard with application fee payment after their application documents are received.

Application fee amount: 10,000 JPY

Payment instruction: Access the website below and follow the instructions for payment.

<https://stg.ex.univ-jp.com/kyoto-u/en/>

For Applicants Residing Outside Japan

Make a payment by credit card (VISA/ MasterCard/ JCB/ AMERICAN EXPRESS/Diners Club INTERNATIONAL).

It is acceptable to use a credit card which carries a name different from that of the applicant (e.g., applicant's parents).

For Applicants Residing in Japan

Make a payment at a designated convenience store, at a financial institution's ATM (Pay-easy), or online with one of the above credit cards or through designated internet banking. It is acceptable to use a credit card or a bank account which carries a name different from that of the applicant (e.g., applicant's parents).

G3. ENROLLMENT PROCEDURES, ADMISSION FEE AND TUITION

ENROLLMENT PROCEDURES

The "Guide to Enrollment" will be mailed to each successful applicant at the postal address specified on the application form. If the applicant wishes to change his/her contact address, notification must be made by e-mail or fax to the Student Affairs Section, Administration Office.

Those who accept the admission offer and intend to enroll in the course must make payment of the admission fee by the deadline specified in the enrollment guide and obtain a College Student Visa by the

commencement of the program. If a student nominates a third party as his/her agent to make a transaction for fee payment, please notify the office.

Those who are currently employed must resign or obtain leave from their current institution/ organization before enrolling in the International Energy Science Course. Similarly, those pursuing studies in other graduate schools must take leave or terminate their graduate study before joining the course.

ADMISSION FEE AND TUITION

Admission fee*: 282,000 JPY (subject to change on admission)
Tuition per annum*: 535,800 JPY (267,900JPY per semester; subject to change during the course of study)

*MEXT scholarship recipients will have admission fee and tuition waived for the designated period of the scholarship.

G4. GENERAL NOTES

- a. Applicant should inform the Administration Office immediately if he/she wishes to withdraw their application.
- b. Changes cannot be made to submitted documents under any circumstances.
- c. Personal information such as name, gender, date of birth, contact address, etc. on the application documents is used only for purposes relevant to: (a) admission examinations; (b) admission procedures; and (c) preparations for acceptance of the student.
- d. In cases where the applicants are physically handicapped and desire special arrangements, please contact the Student Affairs Section, Graduate School of Energy Science, Kyoto University

G5. CONTACT

Student Affairs Section, Administration Office
Graduate School of Energy Science, Kyoto University
Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501 JAPAN

Email: intl@energy.kyoto-u.ac.jp

website: <http://www.energy.kyoto-u.ac.jp/en/>

APPENDIX I: IESC LABORATORY CODE AND KEYWORDS

April 2019

| Code | Laboratory name | Research keywords |
|---|--|---|
| Department of Socio-Environmental Energy Science | | |
| S-1 | Energy Social Engineering (Engineering for Social Systems) | Social Engineering, Recycle, Eco-Materials, Eco-Education, Effective Use of Energy and Resource |
| S-2 | Energy Economics | Energy Systems Studies, Minerals-Energy Nexus, Policy Studies, Sustainability |
| S-3 | Energy Ecosystems (Biomass Energy) | Bioenergy, Biochemicals, Pyrolysis, Gasification, Supercritical Fluid, Bioethanol, Biodiesel |
| S-4 | Energy and Information (Human Machine Interface) | Human Machine Interface, Human-Machine System, Augmented Reality, Organizational Learning, Intellectual Productivity, Pro-environmental Behavior |
| S-5 | Energy and Environment (Energy Environmental Impact) | Aerosol, Atmospheric Environment, Atmospheric Chemistry, Environmental Impact Assessment |
| S-6 | Energy Policy (KURNS) | Energy Policy, Nuclear Energy, Energy Security, Nuclear Security, Non-proliferation, Energy Best-Mix |
| S-7 | Societal Energy Education (KURNS) | Social Energy Education, Disaster Science, Hazard Evaluation, Earthquake Disaster Prevention Strategy |
| Department of Fundamental Energy Science | | |
| K-1 | Energy Chemistry | Energy Chemistry, Electrochemistry, Fluorine Chemistry, Molten Salt, Ionic liquid, Na Secondary Battery, Li Secondary Battery |
| K-2 | Quantum Energy Processes (Materials Chemistry and Physics) | Organic Molecular Materials, Photochemistry, Inorganic Semiconductors, Solid State Physics, Photophysics, Solar Cells, Photocatalysts |
| K-3 | Functional and Solid State Chemistry | Inorganic Material Chemistry, Crystal Chemistry, Electrochemistry, Solid State Chemistry, Electrochemical Materials, Bio-environment Compatible Material, Functional Material Chemistry |
| K-4 | Plasma and Fusion Science | Nuclear Fusion and Plasma Theory, Nonlinear and Non-equilibrium Plasma Physics; Hierarchical Simulation; Laser-matter Interaction |
| K-5 | Electromagnetic Energy | Fusion Energy, Data Analyses of Plasma Experiments, Measurements and Diagnostics, Theory and Numerical Simulation |
| K-6 | Plasma Physics | Microwave Spherical Torus Experiment, Plasma Wave Physics, Equilibrium, Stability and Transport, Plasma Diagnostics |
| K-7 | High-Temperature Plasma Physics (IAE) | Heliotron J, Control of High Temperature Plasma, Plasma Heating, Plasma Diagnostics, Boundary Plasma Physics and Elementary Processes |
| K-8 | Energy Optical Properties (IAE) | Nanoscience, Nanotechnology, Solid State Physics, Solar Cell, Quantum Electronics, Data Driven Science |
| K-9 | Interfacial Energy Processes (IAE) | Electrochemistry, Molten Salt, Ionic liquid, Silicon Solar Cell, Secondary Battery, Genetic Engineering, Bioenergy |
| K-10 | Energy Nano Engineering (IAE) | Nano-science, Nano-materials, Solar Energy, Organic Photovoltaic Cells, Theoretical Biophysics, Statistical Mechanics of Liquids |
| K-11 | Biofunctional Chemistry (IAE) | Nano-biotechnology, Protein Engineering, Chemical Biology, Synthetic Biology, Artificial photosynthesis, Bioenergy |
| K-12 | Bioenergy (IAE) | Bioenergy, Biomass, Structural Biology, NMR, anti-HIV Enzyme, Prion Protein, Aptamer, Bioethanol |
| K-13 | Fundamental Neutron Science (KURNS) | Nuclear Reactor Experiment and Analysis, Criticality Safety, Development of Radiation Detection System |
| K-14 | Heat Transport System (KURNS) | Energy Conversion, Thermal Hydraulics, Multiphase Flow, Neutron Radiography |
| Department of Energy Conversion Science | | |
| H-1 | Thermal Energy Conversion | Thermal Engineering, Power Engineering, Internal Combustion Engine, Pollutant Emission Control, Alternative Fuels |
| H-2 | Conversion Systems | Thermo-Fluid Science, Combustion Science and Engineering, Alternative Fuels, Laser Diagnostics and Image Analysis, Computational Fluid Dynamics |
| H-3 | Materials Design for Energy Systems | Strength of Materials, Fracture Mechanics, Fatigue, Ceramics Coated Materials, Porous Ceramics |
| H-4 | Design for Functional Systems | Mechanics of Functional Materials, Nonlinear Continuum Mechanics, Elastoplasticity, Nondestructive Evaluation by Ultrasonics, Electromagnetic Methods, and Thermography |
| H-5 | Advanced Energy Conversion (IAE) | Plasma Science and Technology, Fusion Technology, Fusion Energy Conversion, Fusion Application, Fusion Energy System Design, Socio-Economic Evaluation of Energy System, Social and Environmental Sustainability Evaluation |
| H-6 | Plasma Energy Conversion (IAE) | Plasma Physics, Fusion Science, Heating and Current Drive, Plasma Diagnostics, Microwave Technology |
| H-7 | Functional Energy Conversion Materials (IAE) | Materials Science and Maintenance Technology for Energy Systems, Fusion Reactor Materials, Nuclear Materials, Computational Materials Science |

Department of Energy Science and Technology * IESC is available only for DOCTORAL programs

| | | |
|-------------|---|--|
| 0-1 | Devices Physics | Crystal Alignment Techniques, Energy Materials, Thin Film Growth, Superconductors |
| 0-2 | Process and Energy | Applied superconductivity energy apparatus, Power system Engineering, Cryogenic Engineering, Thermal hydraulics |
| 0-3 | Materials Process Science | Materials processing, Electrochemical processing, Functional materials, Thin films |
| 0-4 | Thermochemistry | Thermochemistry, Environmental-friendly Processes, Recycling Processes |
| 0-5 | Resources and Energy Systems | Energy-saving materials, Multi-scaling materials, Rock engineering |
| 0-6 | Advanced Processing of Resources and Energy | Computational Physics, Working Process, Process Simulation, Advanced Processing of Eco-materials |
| 0-7 | Mineral Processing | Thermal Fluid Engineering, Resources Circulation, Mineral Processing, Geochemistry, Ocean Resources and Energy |
| 0-8 | Quantum Radiation Energy Science (IAE) | Mid-Infrared and THz Beam, Photophysics, Security Application, Biomass Energy, Renewable Energy System/Policy/Implementation Study |
| 0-9 | The Physics of Energy Materials (IAE) | Aerospace Material, , Nuclear Fission/Fusion Material, Ceramic matrix composites, Environmental Effect |
| 0-10 | Photon Energy Science (IAE) | Laser Application, Nanomaterials, Thin Film, Laser Processing, Nonlinear Optics, Spectroscopy |

IAE (Institute of Advanced Energy, Uji), KURNS(Kyoto University, Institute for Integrated Radiation and Nuclear Science)

LABORATORIES LIST FOR INTERNATIONAL ENERGY SCIENCE COURSE

2020 INTAKE

This table shows the availability of student positions for the Academic Year 2020, relevant academic background and potential fields of undergraduate study for applicants' reference. Please note that this is not an exhaustive list of research areas the faculty members cover and also that only laboratories recruiting students for AY2020 are shown on this table.

| Department | Code | Research group name | Student position availability | | Required background ◆ Relevant background ◇ Tertiary level, not exhaustive | | | | | | | | | | NOTES BY RESEARCH GROUP Remarks, other requirements and/or desirable knowledge etc. | |
|--|------|---|-------------------------------|----------------------------|--|------------------------|-------------------------------|-------------------|-----------------|----------------------|---------------------|---------------------------|----------|---------------------------|--|--|
| | | | Master's program (Oct) | Doctoral program (Apr/Oct) | CIVIL/ENVIRONMENTAL ENGINEERING | MECHANICAL ENGINEERING | ELECTRICAL ENG. & ELECTRONICS | MATERIALS SCIENCE | EARTH RESOURCES | INDUSTRIAL CHEMISTRY | NUCLEAR ENGINEERING | MATHEMATICS & INFORMATION | FORESTRY | WOOD SCIENCE & TECHNOLOGY | | BIO-ENVIRONMENTAL SCIENCE |
| | | | | | | | | | | | | | | | | |
| Socio-Environmental Energy Science | S-1 | Energy Social Engineering (Engineering for Social Systems) | ✓ | ✓ | - | ◇ | - | ◆ | ◆ | ◇ | - | - | - | - | - | Also accepting students who are interested in and able to analyze social issues - requiring proficiency in statistics. |
| | S-2 | Energy Economics | ✓ | ✓ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | ◇ | Energy-systems study; Analysis and design of energy supply-demand systems including human as decision-makers. |
| | S-3 | Energy Ecosystems (Biomass Energy) | ✓ | ✓ | ◇ | - | - | ◇ | - | ◇ | - | - | ◇ | ◇ | ◇ | Undergraduate students in any natural science be accepted, preferentially in biomass-related fields. We study bioenergy and biochemicals from various biomass materials. |
| | S-4 | Energy and Information (Human Machine Interface) | ✓ | ✓ | ◇ | - | ◇ | - | - | - | ◇ | ◇ | - | - | - | ◇ Cognitive psychology ◇ Informatics ◇ Statistics |
| | S-5 | Energy and Environment (Energy Environmental Impact) | ✓ | ✓ | ◆ | - | - | ◇ | ◇ | ◇ | - | - | - | - | ◇ | ◇ Environmental chemistry/physics |
| | S-6 | Energy Policy KURNS | ✓ | ✓ | - | - | - | - | ◇ | - | ◇ | ◇ | - | - | - | Basic knowledge of energy policy and energy scenario study is preferred. |
| | S-7 | Societal Energy Education KURNS | ✓ | ✓ | ◇ | ◇ | ◇ | - | ◇ | - | ◇ | ◇ | - | - | - | |
| Only the research fields of natural science are included in the list above. Applicants in fields of social and human science are also accepted in the Department of Socio-environmental Energy Science. Applicants are recommended to refer to the brochure and webpage of the Graduate School of Energy Science for detailed information on the research topics in each laboratory. | | | | | | | | | | | | | | | | |
| Fundamental Energy Science | K-1 | Energy Chemistry | ✓ | ✓ | - | - | - | ◆ | - | ◆ | - | - | - | - | - | |
| | K-2 | Quantum Energy Processes (Materials Chemistry and Physics) | ✓ | ✓ | - | - | ◇ | ◆ | - | ◇ | - | - | - | - | - | |
| | K-3 | Functional and Solid State Chemistry | ✓ | ✓ | - | - | - | ◇ | - | ◇ | - | - | - | - | ◇ | |
| | K-4 | Plasma and Fusion Science | ✓ | ✓ | - | - | - | - | - | - | - | ◇ | - | - | - | It is preferable that students understand the basics of mechanics, electromagnetics, statistical physics and quantum mechanics. |
| | K-5 | Electromagnetic Energy | ✓ | ✓ | - | - | ◆ | - | - | - | - | ◆ | - | - | - | |
| | K-6 | Plasma Physics | ✓ | ✓ | - | - | ◇ | - | - | - | - | ◇ | - | - | - | It is preferable that students understand the basics of mechanics, electromagnetism, and statistical physics. |

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| Department | Code | Research group name | Student position availability | | Required background ◆ Relevant background ◇ Tertiary level, not exhaustive | | | | | | | | | | NOTES BY RESEARCH GROUP Remarks, other requirements and/or desirable knowledge etc. | | | |
|----------------------------|------|--|-------------------------------|---|--|------------------|---------------------------------|------------------------|-------------------------------|-------------------|-----------------|----------------------|---------------------|---------------------------|--|--|---------------------------|---------------------------|
| | | | | | Master's program | Doctoral program | CIVIL/ENVIRONMENTAL ENGINEERING | MECHANICAL ENGINEERING | ELECTRICAL ENG. & ELECTRONICS | MATERIALS SCIENCE | EARTH RESOURCES | INDUSTRIAL CHEMISTRY | NUCLEAR ENGINEERING | MATHEMATICS & INFORMATION | | FORESTRY | WOOD SCIENCE & TECHNOLOGY | BIO-ENVIRONMENTAL SCIENCE |
| | | | | | | | | | | | | | | | | | | |
| Fundamental Energy Science | K-7 | High-Temperature Plasma Physics IAE | ✓ | ✓ | - | ◇ | ◇ | - | - | - | ◇ | ◇ | - | - | - | | | |
| | K-8 | Energy Optical Properties IAE | ✓ | ✓ | - | - | ◇ | ◇ | - | ◇ | - | ◇ | - | - | - | Knowledge of quantum physics, electrical engineering and material science is preferable. | | |
| | K-9 | Interfacial Energy Processes IAE | ✓ | ✓ | - | - | - | ◆ | - | ◆ | - | - | - | - | ◇ | | | |
| | K-10 | Energy Nano Engineering IAE | ✓ | ✓ | - | - | ◆ | ◆ | - | ◆ | - | - | - | - | - | | | |
| | K-11 | Biofunctional Chemistry IAE | ✓ | ✓ | - | - | - | - | - | ◇ | - | - | - | - | ◇ | Knowledge of organic & inorganic chemistry and biochemistry is preferable. | | |
| | K-12 | Bioenergy IAE | ✓ | ✓ | - | - | - | - | - | - | - | - | - | ◇ | - | ◇Life Science ◇Biochemistry & Molecular Biology | | |
| | K-13 | Fundamental Neutron Science KURNS | ✓ | ✓ | - | - | - | - | - | - | ◆ | - | - | - | - | Knowledge of reactor physics | | |
| | K-14 | Heat Transport System KURNS | ✓ | ✓ | - | ◇ | - | - | - | - | ◇ | - | - | - | - | | | |
| Energy Conversion Science | H-1 | Thermal Energy Conversion | ✓ | ✓ | - | ◆ | - | - | - | - | - | ◇ | - | - | - | | | |
| | H-2 | Conversion Systems | ✓ | ✓ | - | ◆ | - | - | - | - | - | ◇ | - | - | - | Thermo-Fluid Dynamics, Combustion Engineering | | |
| | H-3 | Materials Design for Energy Systems | ✓ | ✓ | - | ◆ | - | ◇ | - | - | - | ◇ | - | - | - | Strength and Mechanics of Engineering Materials | | |
| | H-4 | Design for Functional Systems | ✓ | ✓ | - | ◆ | ◇ | ◇ | - | - | - | ◇ | - | - | - | Nonlinear continuum mechanics | | |
| | H-5 | Advanced Energy Conversion IAE | ✓ | ✓ | - | - | ◇ | - | - | ◆ | ◇ | ◇ | - | - | - | | | |
| | H-6 | Plasma Energy Conversion IAE | ✓ | ✓ | - | - | ◆ | - | - | - | ◇ | ◇ | - | - | - | | | |
| | H-7 | Functional Energy Conversion Materials IAE | ✓ | ✓ | - | ◇ | - | ◆ | - | - | ◇ | ◇ | - | - | - | Mechanics and Thermodynamics of Nuclear Materials | | |

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| Department | Code | Research group name | Student position availability | | Required background ◆ Relevant background ◇ Tertiary level, not exhaustive | | | | | | | | | | NOTES BY RESEARCH GROUP Remarks, other requirements and/or desirable knowledge etc. | |
|-------------------------------|------|--|-------------------------------|------------------|--|------------------------|-------------------------------|-------------------|-----------------|----------------------|---------------------|---------------------------|----------|---------------------------|--|---|
| | | | Master's program | Doctoral program | CIVIL/ENVIRONMENTAL ENGINEERING | MECHANICAL ENGINEERING | ELECTRICAL ENG. & ELECTRONICS | MATERIALS SCIENCE | EARTH RESOURCES | INDUSTRIAL CHEMISTRY | NUCLEAR ENGINEERING | MATHEMATICS & INFORMATION | FORESTRY | WOOD SCIENCE & TECHNOLOGY | | BIO-ENVIRONMENTAL SCIENCE |
| | | | | | | | | | | | | | | | | |
| Energy Science and Technology | 0-1 | Devices Physics | ✓ | ✓ | - | - | ◆ | ◆ | - | ◇ | - | - | - | - | - | Basic knowledge of solid state physics, inorganic chemistry, and crystal engineering is preferable. |
| | 0-2 | Process and Energy | ✓ | ✓ | - | ◆ | ◆ | ◇ | - | - | - | - | - | - | - | |
| | 0-3 | Materials Process Science | ✓ | ✓ | - | - | ◇ | ◆ | - | ◇ | - | - | - | - | - | |
| | 0-4 | Thermochemistry | ✓ | ✓ | - | - | - | ◆ | - | ◇ | - | - | - | - | - | |
| | 0-5 | Resources and Energy Systems | ✓ | ✓ | - | - | - | ◆ | ◇ | - | - | - | - | - | - | |
| | 0-6 | Advanced Processing of Resources and Energy | ✓ | ✓ | - | ◆ | - | ◆ | - | - | - | - | - | - | - | |
| | 0-7 | Mineral Processing | ✓ | ✓ | - | ◇ | - | ◇ | ◆ | ◇ | - | - | - | - | - | |
| | 0-8 | Quantum Radiation Energy Science IAE | ✓ | ✓ | ◇ | ◇ | ◇ | ◇ | - | ◇ | ◇ | ◇ | - | - | ◇ | Accepting students who have interests in Renewable Energy Implementation |
| | 0-9 | The Physics of Energy Materials IAE | ✓ | ✓ | - | ◇ | ◇ | ◆ | ◇ | ◇ | ◆ | - | - | - | - | Basic knowledge of solid state physics, inorganic chemistry, is preferable. |
| | 0-10 | Photon Energy Science IAE | ✓ | ✓ | - | ◇ | ◇ | ◇ | - | ◇ | ◇ | - | - | - | - | Basic knowledge of quantum mechanics or optics is preferred but not necessarily required. |