

GRADUATE STUDENT HANDBOOK

NUCLEAR ENGINEERING PROGRAM

Updated
Fall 2008

University of Idaho
College of Engineering

This information supplements the general information in the current University of Idaho General Catalog. A summary of the University requirements for graduate degrees can be found at <http://www.uidaho.edu/catalog/>

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Undergraduate Preparation for Graduate Students in Nuclear Engineering

Admission to the College of Graduate Studies (COGS) is open to any student who holds a baccalaureate degree and who presents a scholastic record indicating probable success in graduate work. The General Catalog lists the University's GPA admission requirements. Admission to the Nuclear Engineering Graduate Program is open to any student who is admissible to COGS if his or her baccalaureate degree is with a major in engineering from an A.B.E.T. accredited U.S. program.

Students with a B.S. degree from an accredited U.S. engineering program with a major other than nuclear engineering may also be admitted to the Nuclear Engineering Graduate Program. However, such students must demonstrate a basic proficiency in the areas of chemistry, mathematics, physics and energy. This generally requires the student to include courses, in addition to the 30 credits of graduate courses required for the Master's degree. These are assigned as a part of the student's study plan as undergraduate deficiencies. In some situations admission may depend on the student's performance in these additional courses. The subjects included in the following list define the areas for which proficiency is expected as an entrance requirement.

- a. Energy: Thermodynamics (Engr 320), Fluid Dynamics (Engr 335), and Heat Transfer (ME 345)
- b. Chemistry and Physics: Principles of Chemistry II (Chem 112), and Modern Physics (PHYS 305)
- c. Mathematics, Numerical Methods and Computer Programming Language(s)

Each applicant to the program is evaluated individually and may lead to exceptions and/or substitutions to the above requirements.

Students who do not have a B.S. degree from an accredited U.S. engineering program may also be admitted to the Nuclear Engineering Graduate Program. However, such students must demonstrate a proficiency in the basic subjects included in an undergraduate engineering program. This requires the student to include courses, in addition to the 30 credits of graduate courses required for the Master's degree, which are assigned as a part of the student's study plan as undergraduate deficiencies. Student performance in deficiency courses may affect admission decisions. The subjects included in the following list define the areas for which proficiency is expected as an entrance requirement.

- a. An appropriate combination of mathematics and basic science including multivariable calculus (Math 275), ordinary differential equations (Math 310), probability and statistics (Stat 301), chemistry (Chem 111), and calculus based physics (Phys 211, 212, 213).
- b. Sixteen credits of humanities and social sciences including both breadth and depth.

- c. Forty-eight credits of engineering topics which include engineering science and engineering design. Engineering science will include mechanics (Engr 210, Engr 220, Engr 350), thermodynamics (Engr 320), electrical circuits (Engr 240), materials science (MSE 201), and transport phenomena (Engr 335, ME 345). Engineering design must include a meaningful, major engineering design experience that was built upon the fundamental concepts of mathematics, basic science, humanities and social science, engineering topics, and communication skills (a capstone design experience such as ME 424/426 is required).
- d. Appropriate laboratory experience such that the student is competent to conduct experimental work (laboratory classes are required which include an instrumentation class such as ME 330).
- e. Appropriate computer-based experience including the computational techniques needed to solve specific engineering problems (classes such as ME 123/223 are required along with other classes where computers were used to solve specific engineering problems).
- f. Competence in written and oral English communication. This requires both English composition (like Eng 102) and English technical writing (like Eng 317).
- g. An understanding of the ethical, social, economic, and safety considerations in engineering practice (see engineering design under item c above).

The evaluation of equivalent classes will be done on an individual basis. If a student does not have the equivalent of one of the above classes (except capstone design), the student may take the class or challenge it (see procedures for challenge process in UI General Catalog) after appropriate self-study.

Graduate Record Examination and GPA

Graduate Record Examination (GRE) test results are recommended but not required for applicants with an Engineering Baccalaureate degree from a U.S. ABET accredited program. For all other applicants, GRE General Test results are required (the Engineering Subject Test is no longer available). These GRE scores and the applicant's grade point average (GPA) aid the faculty in estimating the applicant's scholastic abilities, which are suggestive of the applicant's probable success in graduate work and are helpful in counseling students in their courses of graduate study. The GRE areas of interest and expected minimum scores are as follows: (These scores may be superseded by new graduate admissions requirements.)

Area	Suggested Approximate Score
GENERAL TEST:	
Verbal (Reading Comprehension)	470
Quantitative (Basic Math and Problem Solving Skills)	680
Analytical Writing (critical thinking and writing)	4.5

Explanation of the Analytical Writing score is listed below.

- SCORE 6 - a cogent, well-articulated analysis of the complexities of the issue and conveys meaning skillfully.
- SCORE 5 - presents a generally thoughtful, well-developed analysis of the complexities of the issue and conveys meaning clearly.
- SCORE 4 - presents a competent analysis of the issue and conveys meaning adequately.
- SCORE 3 - demonstrates some competence in its analysis of the issue and in conveying meaning but is obviously flawed.
- SCORE 2 - paper demonstrates serious weaknesses in analytical writing.
- SCORE 1 - demonstrates fundamental deficiencies in analytical writing skills.
- SCORE 0 - off topic, in a foreign language, merely copies the topic, consists of only keystroke characters, or is illegible, blank, or nonverbal.

International Students

The University of Idaho International Student Programs Office web page is:

<http://www.webs.uidaho.edu/ipo/intlstudents/index.htm>

Please contact them for rules and regulations concerning International Student s.

English Requirements for Students Who's Primary Language is NOT English

The results of the Test of English as a Foreign Language (TOEFL) are required for all students whose primary language is not English. Please contact the International Student Programs Office for more information.

Degree Requirements for M.S. and M.E. Degrees

Thirty credits are required for the M.S. degree and thirty credits are required for the M.E. degree in Nuclear Engineering. At least 18 credits (including thesis for M.S.) must be at the 500 level. No credits may be at the 300 level or lower. In addition, no classes required for the undergraduate degree can be used as part of the graduate program.

The classes in each of these sub-areas are listed on the Nuclear Engineering Three Year Plan. This can be accessed at:

http://www.if.uidaho.edu/docs/Three_Year_Plan.pdf

The combined total of transfer credits, correspondence credits, non-matriculated credits, and approved credits more than eight years old at the time the degree is awarded shall not exceed 12 credits for master's programs. Credits earned at an institution that does not grant graduate degrees cannot be transferred to UI for graduate credit. All other credits submitted to meet the requirements for a Master's degree must have been earned within the eight consecutive years immediately preceding the academic session in which the degree is completed.

Students who have a back ground or experience within Nuclear Science and Engineering (such as Nuclear Navy, National Laboratory, NRF, etc.) but no formal university nuclear courses, in rare circumstances may challenge a course for credit. Students will be required to take exam(s) indicative of the course material and score a satisfactory grade. For additional information about this process please contact your advisor.

The required course distributions for the two degrees follow.

Course of Study Guide for the M.S. Degree (Thesis Option 30 Credits)

Core – 12 credits Selected from the following list. *(All classes are 3 credit hours unless noted)*

NE 450	Principles of Nuclear Engineering
NE 501	Seminar (1 cr., 2 cr. are required)
NE 544	Reactor Analysis (statics and kinetics)
NE 554/Phys 506	Radiation Detection and Shielding
NE 565	Reactor Engineering
NE 585	Nuclear Fuel Cycles
NSEN 447	Nuclear Systems Laboratory (ISU)

Focus Areas – 12 Credits Selected from the following list.

- **Reactor Engineering, Control & Safety Focus**
 - CHE/ME 527 Thermodynamics
 - CE/ME 519 Fluid Transients
 - CE 541/ME 583 Reliability of Engineering Systems
 - ChE/ME 541 Advanced Engineering Analysis
 - CS 430 System Modeling and Simulation
 - ECE 470/ME 481 Control Systems
 - MATH 480 Partial Differential Equations
 - ME 435 Thermal Energy System Design
 - ME 477/577 Design for Manufacture Assembly
 - ME 520/CHE 537 Fluid Dynamics
 - ME 546 Convective Heat Transfer
 - ME/ChE 525 Advanced Heat Transfer
 - NE 462 Nuclear Reactor Codes and Standards
 - NE 525 Transport Theory
 - NE 530 Two Phase Flow
 - NE 575 Advanced Nuclear Power Engineering

- **Reactor Fuels, Chemical Engineering & Chemistry, and Materials Focus**
 - ChE 423 (Chemical) Reactor Kinetics and Design
 - ChE 480/580 Engineering Risk Assessment Hazardous/Radioactive Waste
 - ChE 529 Chemical Engineering Kinetics
 - ChE/ME 515 Transport Phenomena
 - ChE/Me 528 Advanced Thermodynamics
 - MSE 415 Materials Selection and Design
 - MSE 423/523 Corrosion
 - MSE 428/528 Advanced Engineering Ceramics
 - MSE 534 Radiation Effects in Materials
 - MSE/ME 535 Failure of Structural Materials
 - MSE 550 Nuclear Reactor Fuels
 - NE 570 Nuclear Chemical Engineering
 - NE 580 Waste Management and Nuclear Fuel Reprocessing
 - NE 581 Treatment of Radioactive Wastes
 - NE 582 Spent Nuclear Fuel Management and Disposition

- **Individualized Option** – custom develop your own (*15 credit hours of approved study*)

- **Thesis Research** - NE 500 Masters Research & Thesis (6 credit hours)

Advanced Math, Science, or Engineering courses may be used as technical electives with approval of the student's committee. This degree is a minimum of 30 semester hours. Students may transfer in up to 12 graduate credits completed at other accredited universities, subject to university regulations and the approval of the student's graduate committee members. Students must have at least 3 courses (9 credits) in a single focus area to demonstrate depth in study.

Course of Study Guide for the M. Engr. Degree (Coursework Option 30 Credits)

Core – 12 credits Selected from the following list. *(All classes are 3 credit hours unless noted)*

NE 450	Principles of Nuclear Engineering
NE 501	Seminar (1 cr., 2 cr. are required)
NE 544	Reactor Analysis (statics and kinetics)
NE 554/Phys 506	Radiation Detection and Shielding (ISU NSEN 608/609)
NE 565	Reactor Engineering (ISU NSEN 605)
NE 585	Nuclear Fuel Cycles (ISU NSEN g444)
Math 480	Partial Differential Equations (or other advanced Math and/or Computer Modeling courses)
NSEN 447	Nuclear Systems Laboratory (ISU)

Focus Areas – 18 credits Selected from the following list.

• **Reactor Engineering, Control & Safety Focus**

- CHE/ME 527 Thermodynamics
- CE/ME 519 Fluid Transients
- CE 541/ME 583 Reliability of Engineering Systems
- ChE/ME 541 Advanced Engineering Analysis
- CS 430 System Modeling and Simulation
- ECE 470/ME 481 Control Systems
- ME 435 Thermal Energy System Design
- ME 477/577 Design for Manufacture Assembly
- ME 520/CHE 537 Fluid Dynamics
- ME 546 Convective Heat Transfer
- ME/ChE 525 Advanced Heat Transfer
- NE 462 Nuclear Reactor Codes and Standards
- NE 525 Transport Theory
- NE 530 Two Phase Flow (ISU NSEN 625)
- NE 575 Advanced Nuclear Power Engineering (ISU NSEN 615)

• **Reactor Fuels, Chemical Engineering & Chemistry, and Materials Focus**

- ChE 423 (Chemical) Reactor Kinetics and Design
- ChE 480/580 Engineering Risk Assessment Hazardous/Radioactive Waste
- ChE 529 Chemical Engineering Kinetics
- ChE/ME 515 Transport Phenomena
- ChE/Me 528 Advanced Thermodynamics
- MSE 415 Materials Selection and Design
- MSE 423/523 Corrosion
- MSE 428/528 Advanced Engineering Ceramics
- MSE 534 Radiation Effects in Materials
- MSE/ME 535 Failure of Structural Materials
- MSE 550 Nuclear Reactor Fuels
- NE 570 Nuclear Chemical Engineering
- NE 580 Waste Management and Nuclear Fuel Reprocessing
- NE 581 Treatment of Radioactive Wastes (ISU NSEN 618/619)
- NE 582 Spent Nuclear Fuel Management and Disposition

• **Individualized Option** – custom develop your own (*15 credit hours of approved study*)

Advanced Math, Science, or Engineering courses may be used as technical electives with approval of the student's committee. This degree is a minimum of 30 semester hours. Students may transfer in up to 12 graduate credits completed at other accredited universities, subject to university regulations and the approval of the student's graduate committee members. Students must have at least 3 courses (9 credits) in a single focus area to demonstrate depth in study.

Degree Requirements and Course of Study Information for the Ph.D. Degree

The Ph.D. is a research degree. Students are expected to have successfully completed the coursework required for the Master's Degree. Additional in-class coursework, beyond the Master's Degree, is selected based on the Doctoral Research topic and by recommendation of the student's Graduate Committee Members.

The general university guidelines require:

1. A minimum of 78 credits beyond the Bachelor's degree;
2. At least 52 credits in courses numbered 500 and above;
3. At least 33 of the 78 credits must be in courses other than 600 (Doctoral Research and Dissertation).

The Nuclear Engineering Program requires that a minimum of 45 credits beyond the Bachelor's degree must be in research.

Courses listed for the M. Engr. N.E. and M.S.N.E. degrees, or other courses approved by the student's committee, may be used in meeting degree requirements.

The program also requires that of the total course work, at least one-half of the credits beyond the Bachelor's degree be in N.E. related courses. Of the 78 credits submitted to satisfy the degree requirements, a maximum of 30 credits may be more than eight (8) years old when the degree is conferred, provided the Student committee determines that the student has kept current in the subjects concerned. All other degree requirements must be completed no later than five (5) years after the date on which the candidate passed his/her preliminary examination.

Graduate Course Offerings

The Departments at the University of Idaho (UI) and at Idaho State University (ISU) cooperate in supporting each other's graduate programs. Graduate students at either institution may register at their institution to take classes at the other institution.

A plan for course delivery at the Idaho Falls Center can be accessed at the following web address:

http://www.if.uidaho.edu/docs/Three_Year_Plan.pdf

Procedures for Candidates for M.S. Degree

1. Students interested in the program should contact the program director well in advance of the first registration for a tentative evaluation of educational preparation. Deficiencies in undergraduate course preparation for the graduate program will be identified. Students should review the Faculty Research Areas table (Appendix A) and contact faculty with mutual research interests.
2. The student, program director and potential major professor must concur on the nomination of the major professor before three classes are completed. The major professor nominated in conjunction with the student must submit the Appointment of Major Professor and/or Committee form to the College of Graduate Studies.
3. The Student Committee will be nominated by the major professor consulting with the student and the program director. The Student Committee must include:
 - a. The major professor as chairperson.
 - b. An additional member from the Nuclear Engineering Program.
 - c. One member from another department.

All of these committee members must be UI faculty members or affiliate UI faculty members. Graduate Faculty at other academic institutions may also be used. Additional members may be appointed if desired. At least fifty percent (50%) of the committee members must be members of the graduate faculty.

4. The Study Plan must be prepared before three classes are completed. The Student Committee, the Program Director, and the Dean of the College of Graduate Studies approve it. The awarding of the degree is in part contingent upon the completion of the Study Plan.
5. The final defense and comprehensive examination is administered and scheduled by the major professor. All Student Committee members must be present at this examination. The first hour of the examination is to be used by the student to present his/her thesis. Following a ten-minute break, an oral examination will be given to the student on course work and/or matters related to the student's thesis. At the completion of this oral examination, it will be decided if an additional written examination will be required at a later date.

The Application for Advanced Degree must be submitted to the College of Graduate Studies by the end of the semester prior to the semester in which the student intends to graduate. The student will receive the Report of Final Defense that must be signed by the student's committee after the defense and submitted to the College of Graduate Studies.

6. Further information on university and general regulations may be found, including the Graduate Handbook for Theses and Dissertations and forms, from the University of Idaho College of Graduate Studies at www.grad.uidaho.edu and the Registrar at www.uidaho.edu/registrar/forms.html (Appendix B).

Procedures for Candidates for M.E. Degrees

1. Students interested in the program should contact the program director well in advance of the first registration for a tentative evaluation of educational preparation. Deficiencies in undergraduate course preparation for the graduate program will be identified.
2. The student, program director, and potential major professor must concur on the nomination of the major professor before three classes are completed. The major professor nominated in conjunction with the student must submit the Appointment of Major Professor and/or Committee form to the College of Graduate Studies.
3. The Student Committee will be nominated by the major professor consulting with the student and the program director. The Student Committee may include only the major professor as chairperson. Additional UI faculty members or UI affiliate faculty members may be appointed if needed. At least fifty percent (50%) of the committee members must be members of the graduate faculty.
4. The Study Plan must be prepared by the time three classes are completed. The Student Committee, the Program Director, and the Dean of the College of Graduate Studies approve it. The awarding of the degree is contingent in part upon the completion of the Study Plan.
5. The final comprehensive examination is administered and scheduled by the major professor. If the major professor is the only person on the Student Committee, the program director will appoint additional members of the Examining Committee. All Student Committee members must be present at this examination. The oral examination will be for one hour before a ten-minute break. It may be decided at this time that a written examination may be required at a later date, or the oral examination may continue for up to another hour. At the completion of the oral examination it may then be decided that an additional written examination is required at a later date. The awarding of the degree is also contingent upon passing the comprehensive examination. Students are encouraged to seek additional information from the Examining Committee on any information that might help the student properly prepare for the examination.

The Application for Advanced Degree form is completed on-line by the end of the semester prior to the semester in which the student intends to graduate. After the examination, the Non-Thesis Requirement Report must be completed and submitted to the College of Graduate Studies.

6. Further information on university and general regulations may be obtained from the University of Idaho College of Graduate Studies at www.grad.uidaho.edu and the Registrar at www.uidaho.edu/registrar/forms.html (Appendix B).

Procedures for Candidates for Ph.D. Degree

1. Students interested in the program should contact the program director well in advance of the first registration for a tentative evaluation of educational preparation. Deficiencies in undergraduate course preparation for the graduate program will be identified. Students should review the Faculty Research Areas table (Appendix A) and contact faculty with mutual research interests.
2. The student, program director and potential major professor must concur on the nomination of the major professor during the first year. The major professor nominated in conjunction with the student must submit the Appointment of Major Professor and/or Committee form to the College of Graduate Studies.
3. As soon as reasonable and before the bulk of the Ph.D. course work beyond the Master's degree is taken, the major professor will arrange for the Qualifying Examination to be administered by a committee appointed by the department chairperson and major professor. The objective of this examination is to identify course preparation that will be required of the student generally prior to the administration of the Preliminary Examination. This committee will consist of at least three persons (UI faculty or affiliate faculty) qualified to examine the student at the advanced undergraduate level of achievement in the following areas:
 - a. Energy (Nuclear Science, Thermodynamics, General Engineering)
 - b. Chemistry and Physics
 - c. Mathematics, Numerical Methods and Computer Programming Language(s)
4. The Student Committee will be nominated by the major professor consulting with the student and the program director. The Student Committee must include:
 - a. The major professor as chairperson who is a full member of the UI graduate faculty.
 - b. An additional member from the major field.
 - c. One member from a supporting field.
 - d. One member from outside the major field.

The Student Committee members must be UI faculty members or affiliate UI faculty members, or graduate faculty members at other academic institutions. Additional members may be appointed if needed. At least fifty percent (50%) of the committee members must be graduate faculty members.

5. The Study Plan must be prepared soon after the completion of the Qualifying Examination. The Student Committee, the Program Director, and the Dean of the College of Graduate Studies approves it. The awarding of the degree is contingent in part upon the completion of the Study Plan.
6. In lieu of the foreign language proficiency Ph.D. requirement, the Nuclear Engineering Department requires the student to demonstrate proficiency in numerical methods and computer programming. This requirement may be satisfied by the successful completion of courses, or by presenting other evidence to the Student Committee of such proficiency.
7. When the majority of the Ph.D. course requirements on the study plan are

completed, the student may request that the Preliminary Examination be scheduled. In Nuclear Engineering, the Student Committee administers this examination with emphasis on the course work in the major area. All committee members must be present at this examination.

A dissertation proposal and/or progress report must be presented to the Student Committee as a part of the Preliminary Examination. Upon successful completion of the Preliminary Examination, the student is advanced to candidacy.

The Report of Preliminary Examination and Advancement to Candidacy must be completed and submitted to the College of Graduate Studies.

The Application for Advanced Degree is completed by the end of the semester prior to the semester in which the student intends to graduate.

8. The final defense of the dissertation may occur no earlier than five months after advancement to candidacy. The examination is administered by the major professor and is scheduled at least thirty days after the near final copy of the dissertation has been submitted to the Student Committee. All committee members must be present at this examination.

The Request to Proceed to Final Defense must be submitted to the College of Graduate Studies at the beginning of the semester in which the student intends to graduate. The student will receive the Report of Final Defense that must be signed by the student's committee after the defense and submitted to the College of Graduate Studies. Failures must be reported to the College of Graduate Studies.

9. Further information on university and general regulations may be found, including the Graduate Handbook for Theses and Dissertations and forms, from the University of Idaho College of Graduate Studies at www.grad.uidaho.edu or the Registrar at www.uidaho.edu/registrar/forms.html (Appendix B).

Procedures for the Ph.D. Qualifying Examination

The Ph.D. Qualifying Examination is designed to evaluate student preparation for additional doctoral course work. The examination provides guidance in planning the Ph.D. course program to eliminate background deficiencies and strengthen major emphasis areas as appropriate. The examination consists of a two-hour oral and/or written examination in specified subject areas at the advanced undergraduate level. The areas in which the student is expected to be qualified are indicated below.

1. Energy – Nuclear Engineering, Thermodynamics, Heat Transfer, and Fluid Mechanics. (Course preparation*: NE 450, Engr 320, ME 345, and Engr 335 or equivalent).
2. Chemistry and Physics - Principles of Chemistry and Modern Physics (Course preparation*: CHEM 112, and PHYS 305 or equivalent).
3. Mathematics, Numerical Methods and Computer Programming Language(s). (Course preparation*: Math 310, Math 275 and additional computer and mathematics experience).

The program director in consultation with the major professor will appoint the examiner(s) in each area. The student may, at the discretion of the examining committee, be exempted from the written part of the examination because of exemplary performance on the oral portion.

The dates for the Oral Examination are to be arranged with the Nuclear Engineering Program Director.

The results of the Qualifying Examination must be communicated to the Program Director in a memo from the chair of the examination committee.

* Course numbers shown are from the current University of Idaho General Catalog.

Doctoral Preliminary Examination

The Doctoral Preliminary Examination for students in Nuclear Engineering may be given under the direction of the student's major professor when the majority of the course requirements on the study plan have been completed. The purpose of this exam is to ensure that the student adequately reviews and integrates the course work completed and has the necessary technical base upon which the Doctoral research will be based. The exam emphasis will be directed toward the research focus of the proposed dissertation.

Students are encouraged to seek additional direction from their graduate committee on the preparation process for this exam.

The student will be expected to complete an eight-hour written examination on graduate level concepts in either open or closed book form at the discretion of the Student Committee. This examination will usually be scheduled in two four-hour sessions on successive days.

A two-hour Oral Examination will follow the written examination at a later date. The broad areas to be covered are those listed in the study plan. In addition to the examination on course areas, the Doctoral Preliminary Oral Examination includes the presentation of a written dissertation progress report to the Student Committee. This report must be turned into the College of Graduate Studies.

Doctoral Dissertation Defense

At the conclusion of the candidate's research project, a date is arranged with the Student Committee for the student to defend his/her dissertation. Students should consult the Graduate Handbook for Theses and Dissertations for assistance in preparation.

A draft of the dissertation is submitted to members of the Student Committee at least thirty days prior to the date of the defense. The defense consists of a one-hour presentation followed by 30 minutes of questions. After deliberation, the Student Committee may require further research or edits to the dissertation.

Appendix A. Faculty Research Areas
Nuclear Engineering Program
University of Idaho

Idaho Falls Faculty

Crepeau, John C., Ph.D., P.E., Professor

Transition to turbulence in fluid flow and fluid stability; flow visualization; experimental and theoretical studies of drying and drying processes. Solidification of materials with internal heat generation, Nuclear heat transfer.

crepeau@uidaho.edu

Gunnerson, Fred S., Ph.D., Professor and Nuclear Engineering Program Director

Thermo-fluids, nuclear science.

gunner@if.uidaho.edu

Phongikaroon, Supathorn , Ph.D., Assistant Professor

Pyroprocessing technology--theoretical and experimental studies in electrorefinery, oxide reduction and chemistry, and ion exchange. Interfacial phenomena and multi-phase flow systems involving in nuclear and chemical engineering applications.

phonst@if.uidaho.edu

Tokuhiro, Akira, Ph.D., Associate Professor

Thermo-fluid sciences, experiments, nuclear reactor engineering, design and safety, thermohydraulics, convective heat transfer, applied biometrics, energy processes modeling, CFD, applications of silica and polymergels.

tokuhiro@if.uidaho.edu

Utikgar, Vivek, Ph.D., P.E., Associate Professor

Development of energy utilization systems - nuclear hydrogen production, utilization and safety; reactor-hydrogen production interface; energy analysis; electrochemical engineering and fuel cells.

vutgikar@if.uidaho.edu

Moscow Faculty

Bitterwolf, Thomas E., Ph.D., Professor

Hydrogen production, development of novel catalytic materials for the electrolysis of water, generation of ammonia from hydrogen as transportable hydrogen material.

bitterte@uidaho.edu

Charit, Indrajit, Ph.D., Assistant Professor

Microstructure-Property Correlations, Nuclear Materials, High Temperature Mechanical Behavior of Materials (Creep, Superplasticity, Creep-Fatigue), Nanocrystalline Materials, Advanced Processing Techniques (Mechanical Alloying, Friction Stir Processing), Light Metals, Multi-functional Materials.

icharit@uidaho.edu

Lemmon, Clark E., Ph.D., Professor

Mechanical engineering problem solving using numerical simulation with a focus in the area of physical phenomena in thermosciences. Teaching of graphics, problem solving, design and the thermosciences.

ecllem@uidaho.edu

Pesic, Batric, Ph.D., Professor

Nanomaterials, Nuclear Materials.

pesic@uidaho.edu

Liou, Chyr Pyng (Jim), Ph.D., Professor

Numerical and physical modeling of hydraulic transients, thermo-hydraulics, and stratified flows encountered in passive cooling systems.

liou@uidaho.edu

Machleidt, Ruprecht, Ph.D., Professor

Theoretical nuclear physics, theory of nuclear forces and nuclear matter, theoretical modeling.

machleid@uidaho.edu

Appendix B. Forms and Handbooks

Form	Degree	Where Available
Appointment of Major Professor and/or Committee	ME, MS, PhD	www.grad.uidaho.edu click 'Forms'
Study Plan, Change Study Plan, Change Curriculum	ME, MS, PhD	www.grad.uidaho.edu click 'Forms'
Graduate Handbook for Theses and Dissertations	MS, PhD	www.grad.uidaho.edu click 'Theses & Dissertations Handbook'
Application for Advanced Degree	ME, MS, PhD	www.students.uidaho.edu/gradadmissions complete the application on-line
Non-Thesis Requirement Report	ME	www.grad.uidaho.edu click 'Forms'
Qualifying Examination Result Memo	PhD	Written by the chair of the examination committee and sent to the dep't chair.
Report of Preliminary Examination and Advancement to Candidacy	PhD	www.grad.uidaho.edu click 'Forms'
Request to Proceed to Final Defense	MS, PhD	www.grad.uidaho.edu click 'Forms'
Report of Final Defense	MS, PhD	College of Graduate Studies (208) 885-6243 uigrad@uidaho.edu