DOWNLOAD PDF THE FUTURE OF UNIVERSITY NUCLEAR SCIENCE AND ENGINEERING PROGRAMS

Chapter 1 : Nuclear Engineering, MEng, undergraduate degree course/programme - University of Birmingh

Finally, nuclear science and engineering (NS&E) continues to be needed in national security as well as providing the US Navy with effective, safe nuclear propulsion. Thus, the future of nuclear science and engineering programs must be reevaluated and refocused as the new century begins.

BTEC Only considered when combined with other qualifications. Standard English language requirements apply, learn more about international entry requirements. We recommend that you apply for your ATAS certificate as soon as you receive an offer from us. More information can be found here: Depending on your chosen course of study, you may also be interested in one of our foundation pathways, which offer specially structured programmes for international students whose qualifications are not accepted for direct entry to UK universities. Further details can be found on Birmingham International Academy web pages. Demand for places is high and we advise applicants to apply early. Please remember to provide full information on your education history when you apply www. Learn more about applying. Key Information Set KIS Key Information Sets KIS are comparable sets of information about full- or part-time undergraduate courses and are designed to meet the information needs of prospective students. On the Unistats website you are able to compare all the KIS data for each course with data for other courses. They give you access to reliable and comparable information in order to help you make informed decisions about what and where to study. The KIS contains information which prospective students have identified as useful, such as student satisfaction, graduate outcomes, learning and teaching activities, assessment methods, tuition fees and student finance, accommodation and professional accreditation. Overview Learning and teaching You will be taught by a mixture of professors, doctors and postgraduates, thereby receiving a rich diversity of academic knowledge and experience. You can find out more about the members of staff in the School of Metallurgy and Materials where you can read about their qualifications, publication history and specific areas of interest. As a Birmingham student you are part of an academic elite and will learn from world-leading experts. At Birmingham we advocate an enquiry based learning approach, from the outset you will be encouraged to become an independent and self-motivated learner, qualities that are highly sought after by employers. We want you to be challenged and will encourage you to think for yourself. Your learning will take place in a range of different settings, from scheduled teaching in lectures and small group tutorials, to self-study and peer group learning for example preparing and delivering presentations with your classmates. You will have access to a comprehensive support system that will assist and encourage you, including personal tutors and welfare tutors who can help with both academic and welfare issues. You will be able to talk to your tutors about this and discuss if there are particular areas where you need support. What you can expect You can expect an average of about hours of contact time per week, comprising approximately 5 hours of laboratory based activity, 14 hours of lectures and 4 hours of small-group teaching tutorials. As you progress through the programme, an increasing amount of time will be devoted to project-based learning Personal Tutor At the start of your degree, you will be assigned a Personal Tutor who will remain with you throughout your studies to help you in three important areas: Delivery of the course In your first and second years, the course is delivered as lectures, small group workshops, laboratories, computer-based activities, enquiry-based learning and tutorials. A strong emphasis is placed on design and research project work in your third and fourth years respectively. Laboratory classes are embedded within a module and used, not only to develop your experimental practical skills, but also to reinforce concepts introduced in lectures or to explore a particular phenomenon. First year practical sessions, typically, last two hours and increase in length in subsequent years to allow for more advanced experiments. EBL is typically a group activity. This requires working in a team and you can be assessed in a variety of ways: EBL will give you a research-orientated approach to a problem, and has a synergy within research-led institutions like the University of Birmingham. A strong emphasis is placed on project work in your final year. The range of projects includes practical work in the laboratory, or computer-based projects. You can choose the topic of your project from a pool of titles and work with your project supervisor to tailor the project to your particular research interests. You will be assessed through a mixture of written examinations and continually assessed coursework. Examinations are taken in May and June. Assessment methods used include end-of-year examinations, written assignments, and oral presentations, computer-based tests, laboratory and project reports. Some modules are completely assessed by either examination or coursework. We place strong emphasis on providing prompt and informative feedback on all pieces of work that you submit during your studies. Feedback comes in a variety of forms, including written feedback on pieces of assessment, class feedback sessions and one-on-one discussions with your tutors. In all cases, the feedback will highlight the good points as well as those areas that require more attention. As your degree progresses, you will attend fewer lectures and perform more independent studies and practical work in preparation for your final year project. This is in addition to the personal tutor who is based in the School and can help with any academic issue you encounter. Our Academic Skills Centre also offers you support with your learning. The centre is a place where you can develop your mathematical, academic writing and general academic skills. It is the centre? These range from drop-in sessions with support with mathematics and statistics based problems provided by experienced mathematicians, to workshops on a range of topics including note taking, reading, writing and presentation skills. At the beginning of each module, you will be given information on how and when you will be assessed for your particular programme of study. You will receive feedback on each assessment within four weeks, so that you can learn from and build upon what you have done. You will be given feedback on any exams that you take; if you should fail an exam, we will ensure that particularly detailed feedback is made available to enable you to learn for the future. Course details Employability Over the next ten years the UK will embark on an ambitious program of commissioning nuclear energy, creating opportunities from plant design and construction to finding sustainable ways of recycling nuclear materials. This new course has been designed in response to demand from industry for a programme at undergraduate level to equip students with the fundamentals to help provide non-fossil fuel alternatives for our future energy requirements. This challenging and growing field offers a range of well paid careers for graduates with strong technical and scientific skills.

Chapter 2 : Nuclear Engineering | University of Ontario Institute of Technology

The University of Wisconsin, located in Madison, Wisconsin, offers training in nuclear engineering through the Department of Engineering Physics, where students can pursue a B.S. in nuclear engineering and an M.S. and Ph.D. in nuclear engineering and engineering physics.

This hearing builds upon H. The bill would authorize increased funding to the Department of Energy DOE for several university-based programs targeted at nuclear science and engineering. Any differences with the Senate energy bill will need to be resolved in conference. It will explore the following questions: How can we best meet the workforce needs of the future? How should university nuclear research evolve to ensure its vitality? How, if at all, should the federal research and development programs be modified to support these changes? How do we determine the right level of support for university nuclear programs, including infrastructure such as university research reactors? Nuclear Industry Overview With an installed capacity of The Energy Information Administration forecasts that nuclear generating capacity will increase slightly by , to However, with the May announcement that the U. For example, if nuclear energy were to remain 20 percent of U. Funding for programs of particular relevance to this hearing are shown in Table 1 and described below. These programs were authorized by the Committee on Science and are now included in H. Funds for undergraduate scholarships and graduate scholarships have been shown to help increase student enrollments in nuclear engineering and related programs. DOE fellowship funding in this program has remained constant for six years. The fiscal year request would support about 25 graduate students at research universities. In , funding for this broad-based university science grants program had ceased. Since its renewal, NEER has been a major source of research funding for the academic nuclear science and engineering community. These research grants cover areas of basic nuclear science and engineering research and augment the more application-oriented programs funded through NERI. Seven regional URR consortia, distributed across the country, were selected through an independent peer-review panel for funding. In fiscal year , DOE provided funding for four consortia. The fiscal year funding did not increase enough to initiate funding for the remaining three URRs. One of these, the University of Michigan, will shut down and decommission its reactor in July Clearly, the answer depends in large measure on the expected size of the nuclear power industry, which currently employs about 2, nuclear engineers. If the industry expects to grow, the demand for nuclear engineers might be expected to grow, too. Also, the number of university programs that train students in this area have declined from 87 in to 37 in First, the number of engineers needed to run a nuclear power plant has declined. A survey conducted last March by an industry consultant found that utilities intend to replace only about half of all departing employees, making up for the rest by applying new technology, improving processes, etc. Finally, there is disagreement about how much the industry will grow. Also complicating easy predictions of workforce demand is the tendency of a large portion of graduating nuclear engineers to find employment outside the nuclear power industry some, for example, work for the military while others work in related careers like health physics. Conversely, not all employees of the industry have nuclear engineering degrees. Nor do they require one, as graduates with other technical degrees have successfully made careers in the nuclear industry. In fact, a recent report by NEI suggests that the future needs of the nuclear industry could be met by such a shift in career choice of a mere 0. Other questions regarding the future nuclear power workforce involve who will compose it. Also, the overwhelming number of nuclear engineers in the workforce today is white and male. It is unclear how the culture of the industry will need to change if more women enter the field and how those changes will affect the industry. The health of the nuclear research enterprise can be measured by the number and quality of new ideas in the field. Fewer students and graduates can mean fewer new ideas and ways to cope with important issues such as waste disposal and nuclear proliferation. For example, there are currently only two university professors that have published papers on the use of nuclear energy for producing hydrogen. A number of questions remain to be answered: In what ways can the government most economically encourage new ideas and research? What role is there for matching funding requirements, whether from states, industry, or the academic community? How do we determine the right level of government support for these efforts? How many facilities universities need to train students and conduct research is unclear. One the one hand, the number of university research reactors declined from 64 research reactors in the s, to 27 in see Figure 1 for the current locations of university reactors. On the other hand, many of the remaining reactors operate well below capacity. Universities continue to contemplate reactor shutdowns for a variety of reasons, not the least of which is low utilization by the university community. Low utilization, however, could result from several causes: Some experts have even questioned the importance of university reactors to training the nuclear workforce of tomorrow, pointing out that numerous successful and well respected nuclear engineering programs do not have an on-campus reactor, and some campuses have a reactor but no nuclear engineering program. Again, a number of questions remain unanswered: What is the right number and distribution of research reactors? Is the research enterprise best served, as it was in the past, by many small reactors, each owned by an individual university; or by a few larger facilities shared by a number of institutions? If the latter, how will smaller colleges and universities fare? Would a shared approach lead to a more rational distribution of infrastructure and promote new ideas, or could it reduce the diversity of ideas that otherwise might develop among independent research groups? How does DOE decide what the right nuclear research infrastructure should be? How does DOE then ensure that these programs will lead to such infrastructure? Witnesses The following witnesses have been confirmed for the hearing: Marcus also worked at U. She also is the first woman to earn a doctorate in nuclear engineering in the United States. Kammen holds multiple appointments at the University of California, Berkeley. He is also the founding director of the Renewable and Appropriate Energy Laboratory. A physicist by training, his work is focused on the scientific and policy issues relating to energy systems, with a particular focus on renewable energy technologies. Before joining NEI, Ms. Howard was employed by Duke Power Company. Questions for the Witnesses The witnesses have been asked to address the following questions in their testimony. What kinds of innovations or other changes in the industry, in university programs, and in federal nuclear research policy do you believe are necessary if industry is successfully to play that role? How does this projection differ from that of the Energy Information Administration? What changes to these programs, if any, are needed? Other than these programs, what actions should policy-makers take to ensure that an adequate workforce is available? What steps does industry plan to take to ensure it has the workforce it needs in the future? What are the implications for the health of university nuclear science and engineering programs and for the nuclear power industry if DOE were to fall short of implementing those recommendations? To what extent is the existing university nuclear infrastructure, including nuclear research reactors, sufficient to maintain a vibrant nuclear research enterprise the United States? To what extent is it sufficient to provide the workforce training and research opportunities necessary to sustain the nuclear power industry and provide for other societal needs into the future? To what extent can the national laboratories and industry support university programs? Slaughter To what extent is the existing university nuclear infrastructure, including nuclear research reactors, sufficient to maintain a vibrant nuclear research enterprise the United States? To what extent do you believe DOE uses the right criteria in determining whether to support university research reactors? I now call the Subcommittee on Energy to order. America has been truly blessed as the world leader in this area. In fact, at about the same time that nuclear generation of electricity hit an all-time high, the supply of four-year trained nuclear scientists hit a year low. These statistics tell only the beginning of the story, however. That is why I introduced legislation in the th Congress to strengthen university nuclear science and engineering programs at the DOE and ensure an adequate supply of educated personnel. Four of the key provisions from this bill were updated and incorporated into the comprehensive energy bill, H. And now, more than ever, nuclear scientists and engineers are needed for much more than simply operating nuclear power plants. Trained at American universities and national labs, these specialists are needed: Two universities have actually established new programs in nuclear engineering. But not so much has changed as to eliminate the uncertainty of future demand for nuclear scientists and engineers or the predicted gap between supply and demand. Universities continue to question the need for nuclear science and engineering programs as they confront challenges, fiscal and otherwise, associated with maintaining research reactors. And additional security requirements mandated for university research reactors, in the wake of September 11, , have increased costs, just as many cash-strapped states are cutting university budgets. If we, as a nation, are to continue to rely on nuclear energy for 20 percent of our electricity, and that number reaches 50 percent in my home state of Illinois, then we must focus on the people, ideas, and tools necessary to provide an adequate supply of trained and educated personnel. That is what we are here to explore today, and I want to thank the witnesses for their contributions. America has truly been blessed as the world leader in this area. In fact, at about the same time that nuclear generation of electricity hit an all time high, the supply of four-year trained nuclear scientists hit a year low. Resources for the professional development of faculty in the field of nuclear science and engineering; 3. Incentives for students to enter the field, and opportunities for education and training through fellowships and interaction with national laboratory staff; and 4. General research funds for students, faculty, and national laboratory staff. Trained at American universities and national laboratories, these specialists are needed: To help design, safely dispose and monitor nuclear waste, both civilian and military; To develop radio isotopes for the thousands of medical procedures performed every day; To operate and safely maintain our existing supply of fission reactors and nuclear power plants; To help stem the proliferation of nuclear weapons, and respond to any future nuclear crisis worldwide; To design, operate and monitor current and future Naval reactors; and To teach the next generation of nuclear scientists. The good news is that university enrollments are showing some signs of rebounding.

DOWNLOAD PDF THE FUTURE OF UNIVERSITY NUCLEAR SCIENCE AND ENGINEERING PROGRAMS

Chapter 3 : Missouri S&T - Mining & Nuclear Engineering

Laboratory requirements of the degree are assigned zero credits. Most students have earned credit from the Navy Basic Nuclear Power School, which covers more than half of the area of study. Credit may also be earned by advanced Navy training. The first scheduled program planning sessions should be after the student receives formal evaluation of transferred credits and prior to starting courses. Required the general educations courses or equivalent transfer courses prerequisites: Other General Education, Free Electives and Nuclear Elective courses can be taken as determined by student and approved by advisement. The program educational objectives PEOs are broad statements describing the career and professional accomplishments that the Nuclear Energy Engineering Technology program is preparing graduates to achieve. The BS degree with an area of study in Nuclear Energy Engineering Technology strives to produce qualified and competent applied technology engineering professionals who can immediately make substantial contributions to their employers. The PEOs are to: Possess a desire and commitment to be technically current with changing technologies through self-improvement and continuous learning. Strive for increasing levels of leadership and responsibilities in the nuclear field. Demonstrate an ability to understand and apply current concepts in the areas of mathematics, science, and engineering technology. Demonstrate an understanding of nuclear design concepts that are applied within the systems, components, and processes for safe operation of nuclear facilities. Demonstrate effective participation in groups as a valued team member. Demonstrate a capability to solve technical problems through proper identification, research and systematic analysis of the issue. Demonstrate proficiency in oral and written communications to the given audience utilizing standard English. Demonstrate an ability to identify and use appropriate technical literature, documents and procedures. Demonstrate professional, ethical, and social responsibilities within the nuclear energy field, while recognizing differences due to culture and diversity. Demonstrate recognition of the impacts of nuclear technology solutions in an expanding societal and global context. Demonstrate a commitment for quality, timeliness, and continuous improvement in professional activities. Demonstrate knowledge of and an understanding for the Federal, State, and Local regulations, standards, and rules applying to operations and safety in the nuclear energy field.

Chapter 4 : Department of Nuclear Engineering at North Carolina State University Admission

On Tuesday, June 10, , the Energy Subcommittee of the House Science Committee will hold a hearing to examine the future of university nuclear science and engineering programs, and how those programs might affect the future of the nuclear power industry in the United States.

Chapter 5 : Nuclear and Radiation Engineering Program

Graduate Degree Programs. The School of Nuclear Science and Engineering (NSE) offers the following graduate degrees: Nuclear Engineering (MS, Ph.D.).

Chapter 6 : CvE Nuclear Forensics

nuclear science and engineering programs must be reevaluated and refocused as the new century begins. In November , DOE Office of Nuclear Energy, Science and Technology requested that NERAC establish an ad hoc panel to consider educational issues related to the future of nuclear science and.

DOWNLOAD PDF THE FUTURE OF UNIVERSITY NUCLEAR SCIENCE AND ENGINEERING PROGRAMS

Chapter 7 : The Future of University Nuclear Science and Engineering Programs

A place in the past and a stake in the future. Founded in , the Oregon State University School of Nuclear Science and Engineering (NSE) today boasts a global influence and is one of the top programs in the United States.

Chapter 8 : Programs | Engineering | University of Waterloo

The future of university nuclear science and engineering programs: hearing before the Subcommittee on Energy, Committee on Science, House of Representatives, One Hundred Eighth Congress, first session, June 10,

Chapter 9 : Nuclear Engineering (Doctoral program) | University of Ontario Institute of Technology

The program focuses on nuclear engineering fundamentals, with emphasis on ionizing radiation. These students often go on to further study in health or medical physics. Find out about admission requirements, suggested course sequences, and friendly advice from alumni in the undergraduate handbook.