



PUBLIC INFORMATION AND ACCEPTANCE OF NUCLEAR ENGINEERING  
STUDIES AT THE FACULTY OF NUCLEAR SCIENCES AND PHYSICAL  
ENGINEERING OF CTU PRAGUE

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The Faculty of Nuclear Sciences and Physical Engineering was founded in 1955, when the nuclear programme in Czechoslovakia has been launched. In approximately the same time also some nuclear research institutes were founded, as, e.g., the Institute of Nuclear Research and the Research Institute of Nuclear Instruments, etc., extensive plans of development of nuclear power production were drafted, and everybody was very enthusiastic for this new branch of science and technology. This lucky situation imprinted a character of very modern and high - quality institution to this new Faculty, and its founders, who were the leading personalities of Czech physical, mathematical and chemical sciences, contributed substantially to this image. Nuclear physics and related sciences provided a good platform for developing the Faculty curricula on up-to-date level and to offer the graduates excellent training in general physics, mathematics and chemistry, as well as in some specialised fields. This effort was generally accepted by the public and although the degree courses were said to be rather difficult, the number of applicants for being accepted to the Faculty remained very high. As the "numerus clausus" was then determined and given by the state, the ratio of the applicants to the enrolled was usually about five or six to one. Nevertheless even in those early days

the Faculty was not purely "nuclear" and some other fields of applied physical sciences were a matter of interest as well.

The present status of nuclear technology and the new trends in applied hard sciences have resulted in widening the profile of the Faculty, because the staff has intended to preserve it as a modern and advanced part of the University. It means that now nuclear sciences represent about one third of the programme and the structure of its responsibilities is as follows:

A. Nuclear Engineering:

- nuclear reactors - their design, construction, operation and control, nuclear safety, including environmental impact and related problems,
- dosimetry and application of ionizing radiation - applied radiation physics in technology, science and medicine, dosimetry and radiation protection, environmental radiation,

B. Nuclear Chemical Engineering :

(not subdivided into specialisations) covers all that may be included into this branch of science,

C. Physical Engineering :

- solid state - structure of solids, measurement methods, semiconductor technologies,
- physics of materials - reliability of mechanical systems, failure analysis, measurement methods,
- physical electronics - lasers and optoelectronics, laser plasma, quantum electronics, computational methods in electronics,

D. Mathematical Engineering :

- mathematical modelling,
- software engineering and information sciences.

What has remained from the early days is a great effort to provide the students with a profound mathematical and physical background and an effort to integrate all the students - as soon as possible - into teamwork and into research projects (starting in the sixth semester of the ten semesters degree course).

What is the public acceptance of the Faculty nowadays? Two unfavourable trends act against the interest to enrol at the Faculty. The first one is general - a decreasing interest of the young in engineering, given probably by both higher work-load in comparison with, e.g., social sciences, and a not very high social status of engineering graduates in the former socialist society. Unfortunately, this situation has not yet turned to the better in our changing conditions. The second trend is given by a strong antinuclear opposition and campaigns in the past few years, relatively latent between the Tchernobyl accident and 1989, because the former regime had not allow any discussions about this subject, and clearly apparent after the 1989 November revolution. These antinuclear tendencies were also fuelled by the effective Greenpeace campaign in 1990, imported mostly from Austria, and, unfortunately, unfounded from the scientific point of view. This situation could be demonstrated by the number of graduates during the last few years (see Table 1).

How can the Faculty resist this ebb of interest, which is undesirable both from the point of view of the Faculty and our society, not only because of the continuing programme of nuclear power production, but also because of

Table 1: Annual number of graduates of the Faculty of Nuclear Sciences and Physical Engineering in various specialisations.

Year	NR	DA	NC	SS	PM	PE	ME	Total
1983	7	12	11	10	7	10	10	67
1984	10	10	8	4	4	8	14	58
1985	15	14	6	6	6	10	13	70
1986	17	23	9	10	4	17	15	95
1987	16	16	8	9	13	18	16	96
1988	11	8	9	7	7	15	16	73
1989	14	11	7	7	5	10	10	64
1990	8	4	6	7	4	11	9	49
1991	11	9	4	7	4	8	11	54
1992	7	9	16	8	4	12	11	67
1993 <sup>x</sup>	2	9	8	9	6	11	11	56
Total <sup>xx</sup>	116	116	84	75	58	119	125	693
<sup>x</sup> expected number <sup>xx</sup> 1983 - 1992								
NR - Nuclear Reactors DA - Dosimetry and Application of Ionizing Radiation NC - Nuclear Chemistry SS - Solide State Engineering PM - Physics of Materials PE - Physical Electronics ME - Mathematical Engineering								

the need of nuclear specialists in medicine, industrial testing, radiation technologies, environmental sciences, hygiene, etc. First of all this can be achieved by suitable modification of curricula towards "computerisation" and "ecologisation". Nuclear sciences offer a wide scope for developing both these modifications. In the last few years many lectures have appeared on these subjects. They start with an optional introductory course in computer science and programming, recommended to the first year students, and they are concluded by highly specialised courses in low activity measurements, environmental chemistry, computer physics, nuclear safety, environmental sciences, etc., for advanced students. The same is true not only for the 5-year engineering courses which are the basis of teaching responsibility of the Faculty, but also for PhD. studies and, even more, for the newly introduced 3-year bachelor courses. In the latter type of courses new specialisations were set up, one of them being Instrumentation and Information Science, the other Radiation Protection and the Environment. These changes meet and suit the interests of young people and help to keep the enrollment relatively stable.

More activities instrumental in establishing the image of the Faculty are needed, of course. Priority is given to cooperation with mass media as the press, TV and so on. So, for example, in 1989 before starting-up the School Nuclear Reactor VR-1 a press conference was held and articles appeared in all the quality newspapers informing about the basic parameters, nuclear and radiation safety and contribution of this facility to students training and research. Last year another - in this case non-nuclear successful event was used for publicizing the Faculty: A laboratory for visually impaired was opened, equipped with computers capable to communicate with them, and a programme

of university training of the visually impaired has been started, the first in this field in the former Czechoslovakia. Though the courses are not in the nuclear field, but in mathematical engineering, the Faculty as a whole has again been brought to public notice. It also took part in the TV discussion programme about education and research at Czech universities, in the popular Czech radio programme "Meteor", after the accident in the Russian power plant Sosnovy Bor the member of the Faculty staff contributed to the Czech language broadcasting of the BBC, etc.

Direct contacts with high and grammar schools are another activity helping to keep up the interest of the young in the Faculty. "Open House" for high and grammar schools is organized twice every year. Nevertheless, we are not convinced that this possibility to come and get acquainted with the Faculty is fully effective, because those, who take part, are usually the prospective students, and they would anyhow send their application. Therefore, also written information is sent to the schools every year, including posters informing about the courses offered by the Faculty. Moreover, the debates about the Faculty and the Technical University and lectures on selected physical, mathematical and chemical topics are offered as well. It is especially the young teaching and research staff and PhD. students who are engaged in these activities.

Also, wide use of our reactor by other faculties of the Czech Technical University and other Czech and Slovak universities contributes to the good image of the Faculty in the public. In the academic year 1991-92 12 various faculties made direct use of the reactor in training, they took part in excursions or their staff took part in the courses organized by our Nuclear Reactor Department. The

response to these events was very positive. A video-programme shot by Krátký film Bratislava on the "School Nuclear Reactor" has been distributed to selected schools to inform about reactor engineering courses and for educational purposes. "Cerenkov radiation shows" organised occasionally by the Department for excursions and invited guests from other universities are quite attractive. Cooperation with the Institute of Nuclear Information and the Dukovany Nuclear Power Plant in informing the visitors about nuclear science and technology provides wider possibilities and more qualified approach to such nuclear-reactor-based activities.

Radioecological activities of the Faculty also contribute well to its publicity. The Radioecological Society has been founded, intending to be an independent body reviewing the problems of radiation in the environment. This society has been established at the Faculty and is headed by Professor P. Beneš, Department of Nuclear Chemistry. Results of our radioecological engagement are clearly visible, e.g., the Association of Towns and Municipalities in the Temelín Nuclear Power Plant region has approached the Faculty staff with a request to review the environmental impact in this area, a similar activity was the participation in the discussion on the problems of uranium mine tailing pond, organized by the Citizens Initiative in Rožná.

And, last but not least, many minor Faculty incentives should help to attract the public eyes to the Faculty. One of the most curious ones is our Department of Nuclear Reactors sponsoring the rearing of sloths in the Prague ZOO. Faculty T-shirts are another mode of advertisement. But, returning to more serious matters closer to the programme of the Faculty, the publicity given to various conferences and

symposia organized by the Faculty can also contribute to its good name. In the not too distant past it was, e.g., an international symposium held on the occasion of the 150th anniversary of the Doppler phenomenon (at that time Ch.A.Doppler was Professor of the Technical University in Prague).

To conclude this review of how to recruit applicants to the Faculty let us say that : Although the appeal of nuclear branches is at its lowest point now, a faculty having the word "nuclear" in its name may still be quite appealing to a sufficient number of young people and it can live without dangerous decrease in the number of enrolled students and graduates. We cannot be sure which of the activities listed are efficient and which are dispensable, but, generally speaking, the image of the Faculty is quite stable and not unfavourable. And, moreover, there have been no placement problems for graduates, which is the most convincing argument supporting our decision not to give up our work in the nuclear field.