An Innovative Curriculum Model to Boost the Number of Medical Physicists and Radiation Protection Experts in Radiation Medicine

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Purpose

In many countries in the world the medical-physics/radiation-protection professions face an acute shortage of entrants owing to the irregular number of physics/engineering graduates and low popularity of two year masters programmes. Under such conditions of uncertainty the professions would not only fail to grow but inevitably decline, leaving healthcare facilities without adequate medical-physics/radiation-protection services.

A formula needed to be found to: (a) ensure that the potential stock of entrants to the professions would be independent of erratic student numbers in physics/engineering (b) address the paradox of having to reduce the masters programme to one year at a time when the knowledge-skills-competences required for modern medical-physics / radiation-protection practice are expanding rapidly owing to the increasing complexity of medical device technology and clinical protocols.

Methods

A survey of medical-physics/radiation-protection education programmes and documentation was carried out and elements of best practice identified. The latter were used to guide the curriculum development process. Stakeholders were consulted and their suggestions implemented in the curriculum.

Results

It was considered that the best way forward would be to opt for a *4 year undergraduate inter-faculty programme that combined physics and medical physics/radiation protection plus a one year postgraduate Masters*. The resulting undergraduate programme consists of 5 parallel strands (see table below). The physics/mathematics/statistics component is sufficiently strong to ensure a strong scientific foundation whilst the medical-physics/radiation-protection component is sufficiently comprehensive to permit the reduction of the Masters in Medical Physics from two years to one.

Programme overview can be found here:

https://www.um.edu.mt/courses/overview/UBSCHPMRFT-2020-1-O

Full curriculum with study unit descriptions including learning outcomes here:

https://www.um.edu.mt/courses/programme/UBSCHPMRFT-2020-1-O

Conclusions

We are pleased to report that the innovative curricular experiment has been a great success. The combination of pure and applied physics, the inter-faculty nature of the programme (where students share lectures with both physics and healthcare professions students) together with the element of clinical practice have been found to be the most attractive features of the programme. The programme has provided a welcome boost for both the medical-physics/radiation-protection professions and indeed even physics itself.

Year	Physics Mathematics Statistics	Anatomy Physiology Pathology	Medical Physics Radiation Protection	Hospital Placements	Research Ethics Legislation Professional Issues
Year 4	**		*****	*	***
Year 3	***	*	****	*	*
Year 2	****	**	**	*	*
Year 1	****	****	*		*