

**ADVANCED SKILLS FOR TREATMENT DELIVERY**  
09-12 February 2014  
Amsterdam, the Netherlands



**MULTIDISCIPLINARY TEACHING COURSE ON PROSTATE CANCER**  
23-27 February 2014  
Amsterdam, the Netherlands

**CLINICAL PARTICLE THERAPY**  
23-27 February 2014 | Nice, France

**UNDERSTANDING AND MANAGEMENT OF MORBIDITY**  
Postponed to 2015



**ADVANCED TECHNOLOGIES**  
07-11 March 2014 | Amman, Jordan



**MODERN BRACHYTHERAPY TECHNIQUES**  
09-12 March 2014 | Gdansk, Poland

**DOSE MODELLING AND VERIFICATION FOR EXTERNAL BEAM RADIOTHERAPY**  
09-13 March 2014 | Prague, Czech Republic

**ESTRO 33 PRE-MEETING COURSES**  
04 April 2014 | Vienna, Austria

**PHYSICS FOR MODERN RADIOTHERAPY**  
*A JOINT COURSE FOR CLINICIANS AND PHYSICISTS*  
04-08 May 2014 | Madrid, Spain

**EVIDENCE AND NEW CHALLENGES IN RECTAL CANCER**  
08-11 May 2014 | Prague, Czech Republic

**TARGET VOLUME DETERMINATION - FROM IMAGING TO MARGINS**  
16-18 May 2014 | Tokyo, Japan



**ADVANCED BRACHYTHERAPY PHYSICS**  
18-21 May 2014 | Brussels, Belgium



**BASIC CLINICAL RADIOBIOLOGY**  
25-29 May 2014 | Istanbul, Turkey

**EANM/ESTRO EDUCATIONAL SEMINAR**  
*POSITRON EMISSION TOMOGRAPHY (PET) IN RADIATION ONCOLOGY*  
30-31 May 2014 | Brussels, Belgium

**IMRT AND OTHER CONFORMAL TECHNIQUES IN PRACTICE**  
08-12 June 2014 | Torino, Italy

**COMBINED DRUG-RADIATION TREATMENT: BIOLOGICAL BASIS, CURRENT APPLICATIONS AND PERSPECTIVES**  
09-12 June 2014 | St. Petersburg, Russia

**BRACHYTHERAPY FOR PROSTATE CANCER**  
19-21 June 2014  
Dublin, Republic of Ireland

**COMPREHENSIVE QUALITY MANAGEMENT IN RADIOTHERAPY**  
*PART I - RISK MANAGEMENT & PATIENT SAFETY*  
26-29 June 2014 | Poznan, Poland

**BIOLOGICAL BASIS OF PERSONALISED RADIATION ONCOLOGY**  
29 June - 02 July 2014 | Brussels, Belgium

**MULTIDISCIPLINARY MANAGEMENT OF HEAD AND NECK ONCOLOGY**  
29 June - 02 July 2014 | Athens, Greece

**ACCELERATED PARTIAL BREAST IRRADIATION**  
06-09 September 2014 | Barcelona, Spain

**CLINICAL PRACTICE AND IMPLEMENTATION OF IMAGE-GUIDED STEREOTACTIC BODY RADIOTHERAPY**  
07-11 September 2014 | Florence, Italy

**IMAGING COURSE FOR PHYSICISTS**  
14-18 September 2014 | Porto, Portugal

**BASIC TREATMENT PLANNING**  
*BACK TO BACK WITH ADVANCED TREATMENT PLANNING*  
16-20 September 2014 | Budapest, Hungary

**ADVANCED TREATMENT PLANNING**  
*BACK TO BACK WITH BASIC TREATMENT PLANNING*  
21-25 September 2014 | Budapest, Hungary

**IMAGE-GUIDED RADIOTHERAPY AND CHEMOTHERAPY IN GYNAECOLOGICAL CANCER - FOCUS ON ADAPTIVE BRACHYTHERAPY**  
28 September - 02 October 2014  
Florence, Italy

**EVIDENCE-BASED RADIATION ONCOLOGY: A CLINICAL REFRESHER COURSE WITH A METHODOLOGICAL BASIS**  
05-10 October 2014 | Varna, Bulgaria

**ADVANCED TECHNOLOGIES**  
19-23 October 2014 | Chennai, India

**BEST PRACTICE IN RADIATION ONCOLOGY - A WORKSHOP TO TRAIN RTT TRAINERS**  
*IN COLLABORATION WITH THE IAEA PART I - TRAIN THE RTT TRAINERS*  
20-24 October 2014 | Vienna, Austria

**COMBINED DRUG-RADIATION TREATMENT: BIOLOGICAL BASIS, CURRENT APPLICATIONS AND PERSPECTIVES**  
02-05 November 2014  
Yogyakarta, Indonesia

**ESOR/ESTRO COURSE: MULTIDISCIPLINARY APPROACH OF CANCER IMAGING**  
06-08 November 2014  
Maastricht, the Netherlands

**3<sup>RD</sup> MASTERCLASS IN RADIATION ONCOLOGY**  
09-12 November 2014 | Lisbon, Portugal

**TARGET VOLUME DETERMINATION - FROM IMAGING TO MARGINS**  
09-13 November 2014 | Vienna, Austria

**MULTIDISCIPLINARY TEACHING COURSE ON LUNG CANCER**  
28-30 November 2014 | Guangzhou, China

**IMAGE-GUIDED RADIOTHERAPY IN CLINICAL PRACTICE**  
30 November - 04 December 2014  
Brussels, Belgium

**QUANTITATIVE METHODS IN RADIATION ONCOLOGY: MODELS, TRIALS AND CLINICAL OUTCOMES**  
07-10 December 2014 | Vienna, Austria

2014

QUANTITATIVE METHODS IN RADIATION ONCOLOGY: MODELS, TRIALS AND CLINICAL OUTCOMES

07-10 December 2014  
Vienna, Austria



COURSE DIRECTOR  
Søren M Bentzen (US)

TEACHERS  
Francesca Buffa (UK)  
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Randall ten Haken (US)  
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Ivan Richter Vogelius (DK)

LOCAL ORGANISER  
Dietmar Georg, Medical University Vienna

PROJECT MANAGER  
Gabriella Axelsson

### COURSE AIM

- be aware of the most commonly used quantitative methods in radiation oncology and radiation biology and the assumptions behind these
- be able to identify appropriate quantitative methods of analysis for a given data set
- be able to critically evaluate modelling results especially with respect to proper validation and estimates or uncertainties

### TARGET GROUP

The course is aimed at physicians medical physicists and radiation therapists.

### EDUCATIONAL PROGRAMME

Radiation Oncology is unique among the medical specialties due to a strong quantitative overhead bioeffect models of normal tissue complication probability (ntcP) and tumour control probability (tcP) support clinical decision making and are increasingly used in mathematical optimisation of radiation therapy plans. While most of the models are fairly simple – in some cases over-simplified – the problem is that their predictive value is limited by uncertainties in the model parameters uncritical reliance on model results may compromise patient safety or treatment outcome. The aim of this course is to make the attendees critical users of models and better at making model-supported decisions.

### Topics covered

- Models and modelling, hypothesis testing and parameter estimation, type I and II uncertainties
- Clinical trials and evidence-based medicine, Phase 0-IV trial designs, meta-analysis, clinical endpoints, survival statistics and the cox proportional hazards model
- Statistical modelling and exploratory data analysis, simple mechanistic models, external and internal validity of models, bootstrap and Monte Carlo methods, goodness of fit
- Dose-response models, normal tissue complication probability (ntcP) and tumour control probability (tcP) models, modelling combined modality therapy, patient-to-patient variability in response, the linear-quadratic model and beyond, generalised equivalent uniform dose, use of models in treatment planning
- Predictive assays, roc and Auc, sensitivity, specificity, positive and negative predictive value
- Hierarchical clustering, principal component analysis, neural network, support vector machines, data mining
- High dimensionality data sets, over-fitting, training and validation sets, sample splitting, K-fold validation

### WORKING SCHEDULE

The course starts on Sunday 7 December 2014 at 08:15 and ends on Wednesday 10 December 2014 at 16:45.

To be able to start on time, participants are encouraged to register on Saturday 6 December between 18:00 and 19:00.

### LANGUAGE

The course is conducted in English.  
No simultaneous translation will be provided.

### PRACTICAL ORGANISATION

#### COURSE ORGANISATION

For any further information please contact ESTRO:

Gabriella Axelsson  
✉ gaxelsson@estro.org  
☎ +32 2 775 93 40  
📠 +32 2 779 54 94

#### COURSE VENUE

Details of the venue will be available at a later date.

#### LOCAL ORGANISER

Dietmar Georg, Medical University Vienna  
✉ Dietmar.Georg@akhwien.at

#### TECHNICAL EXHIBITION

Companies interested in exhibition opportunities during this teaching course should contact:

Gabriella Axelsson, *Project Manager*  
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#### ACCOMMODATION

To book your room, please download the accommodation form from the ESTRO website: [www.estro.org/school](http://www.estro.org/school)

### PARTICIPANTS SHOULD REGISTER ONLINE AT: [WWW.ESTRO.ORG/SCHOOL](http://WWW.ESTRO.ORG/SCHOOL)

These pages offer the guarantee of secured online payments. The system will seamlessly redirect you to the secured website of OGONE (see [www.ogone.be](http://www.ogone.be) for more details) to settle your registration fee.

If online registration is not possible please contact us:

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### REGISTRATION FEES

	UP TO ??/??/14 INCLUSIVE	AFTER ??/??/14
In-training members*	450 €	625 €
Members	600 €	725 €
Non members	750 €	850 €

\* RTT members are eligible for the in training fee

The fee includes the course material, coffees, lunches, and the social event.

**REDUCED FEES** are available for ESTRO members working in economically less competitive countries. Check the eligible countries and the selection criteria on the website of the ESTRO School.

**ESTRO GOES GREEN** - Please note that the course material is now distributed onsite on a USB key. No printed course book will be provided during the courses.

### ADVANCE REGISTRATION AND PAYMENT ARE REQUIRED. ON-SITE REGISTRATION WILL NOT BE AVAILABLE.

Since the number of participants is limited, late registrants are advised to contact the ESTRO office before payment, to inquire about availability of places. Access to homework and/or course material will become available upon receipt of full payment.

### INSURANCE AND CANCELLATION

The organiser does not accept liability for individual medical, travel or personal insurance. Participants are strongly advised to take out their own personal insurance policies.

In case an unforeseen event would force ESTRO to cancel the course, the Society will reimburse the full registration fees to the participants. ESTRO will not be responsible for the refund of travel and accommodation costs.

In case of cancellation, full refund of the registration fee minus 15% for administrative costs may be obtained up to three months before the course and 50% of the fee up to one month before the course. No refund will be made if the cancellation request is postmarked less than one month before the start of the course.