

SCIENTIFIC PROGRAMME

Course Director

Søren M. Bentzen (USA)

Faculty

Ane L. Appelt (UK)

C. David Fuller (USA)

Johannes A. Langendijk (NL)

Jens Petersen (DK)

Ivan R. Vogelius (DK)

DAY 1 – Sunday 4 December

Time	Lecture	Speaker
08:30 - 09:00	Course Intro	
Theme 1: Dose-response and Outcomes Modeling		
09:00 - 09:45	Intro – Models and Modeling	Søren M. Bentzen
09:45 - 10:30	Dose-response models	Ane L. Appelt
10:30 - 11:00	Coffee/Tea break	
11:00 - 11:30	NTCP models	Ane L. Appelt
11:30 - 12:15	Evaluation and validation of models	Ivan R. Vogelius
12:15 - 13:00	Hot topic: Model-based selection of patients for proton therapy	Johannes A. Langendijk
13:00 - 14:00	Lunch	
Theme 2: AI and ML		
14:00 - 14:45	Introduction to AI and ML	Jens Petersen
14:45 - 15:30	Image analysis with deep learning	Jens Petersen
15:30 - 16:15	Systematic appraisal of scientific papers	Søren M. Bentzen
16:15 - 16:45	Coffee/Tea break	
16:45-18:00	Meet-the-professor - Bring Your Own Science	Attendees/All faculty

DAY 2 – Monday 5 December

Time	Lecture	Speaker
08:30 - 09:00	Summary & Intro	
Theme 3: Statistics I		
09:00 - 09:45	Intro and parameter estimation/model fits	Ivan R. Vogelius
09:45 - 10:30	Statistical estimation: regression, correlation & survival statistics	Søren M. Bentzen
10:30 - 11:00	Coffee/Tea break	
11:00 - 11:45	Cox PHM	Søren M. Bentzen
11:45 - 12:30	Sample size & power	Ivan R. Vogelius
12:30 - 13:00	Debate: ML versus conventional stats	Søren M. Bentzen vs C. David Fuller
13:00 - 14:00	Lunch	
Theme 4: Clinical trials I		
14:00 - 14:45	Clinical trials in Radiation Oncology	Johannes A. Langendijk
14:45 - 15:30	Novel trial designs, adaptive designs, biomarkers trials	Søren M. Bentzen
15:30 - 16:15	Elective block – topics proposed by attendees	All faculty
16:15 - 16:45	Coffee/Tea break	
16:45-18:00	Elective block – topics proposed by attendees	All faculty

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DAY 3 – Tuesday 6 December

Time	Lecture	Speaker
08:30 - 09:00	Summary & Intro	
Theme 5: AI and ML II		
09:00 - 09:45	Bayesian statistics	Søren M. Bentzen
09:45 - 10:30	Imaging in radiation oncology	C. David Fuller
10:30 - 11:00	Coffee/Tea break	
11:00 - 11:30	Image segmentation with deep learning	Jens Petersen
11:30 - 12:15	Testing new technologies	C. David Fuller
12:15 - 13:00	ML in radiation oncology	C. David Fuller
13:00 - 14:00	Lunch	
Theme 6: Statistics II		
14:00 - 14:45	Diagnostic tests, PPV, NPV, sensitivity and specificity	Ane L. Appelt
14:45 - 15:30	"AI will take your job!!"	Attendees
15:30 - 16:15	Endpoints for treatment outcome	Johannes A. Langendijk
16:15 - 16:45	Coffee/Tea break	
16:45-18:00	Group exercise: Designing a trial of SBRT for 4-10 mets	

DAY 4 – Wednesday 7 December

Time	Lecture	Speaker
08:30 - 09:00	Summary & Intro	
Theme 7: Clinical trials II		
09:00 - 09:45	Grand Challenges	Jens Petersen
09:45 - 10:30	An infrastructure for clinical radiation research	Johannes A. Langendijk
10:30 - 11:00	Coffee/Tea break	
11:00 - 11:45	Ethics and regulatory oversight (Workshop)	
11:45 - 12:30	Data presentation + competing risks	Ivan R. Vogelius
12:30 - 13:00	Models in clinical practice	C. David Fuller
13:00 - 14:00	Lunch	
Theme 8: Concluding sessions		
14:00 - 14:45	Meta-analysis	Ivan R. Vogelius
14:45 - 15:30	Pitfalls	Søren M. Bentzen
15:30 - 16:00	Course evaluation	