

Location: VIC rm 1605 (Physics Conference Room)

Tues / Thurs 1:30 - 2:45 pm

**Course Instructors:**

Thor Bjarnason	CT	CSI / IH (BCCA)	<a href="mailto:Thor.Bjarnason@interiorhealth.ca">Thor.Bjarnason@interiorhealth.ca</a>	250 826 0722
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Tony Mestrovic	Ultrasound	VIC (BCCA)	<a href="mailto:amestrovic@bccancer.bc.ca">amestrovic@bccancer.bc.ca</a>	250 519 5634
Derek Wells	Radiography	VIC (BCCA)	<a href="mailto:dwells@bccancer.bc.ca">dwells@bccancer.bc.ca</a>	250 519 5629

Week	Date	Instructor	Assign/Lab		Lecture number, Title	Details
week 1	Sept 4	TM	A1 out		1 Intro	Handouts, assign reading
week 2	Sept 9	TB			2 Discussion session	X-ray CT
	Sept 11	TB			3 Discussion session	X-ray CT
week 3	Sept 18	TB	A2 out	A1 due	4 Laboratory 1	X-ray CT
week 4	Sept 23	DW			5 Discussion session	Radiography
	Sept 25	DW		Lab1 due	6 Discussion session	Radiography
week 5	Sept 30	DW			7 Discussion session	Radiography
	Oct 2	DW			8 Discussion session	Radiography
week 6	Oct 7	DW			9 Discussion session	Radiography
	Oct 9	DW	A3 out	A2 due	10 Laboratory 2	Radiography
week 7	Oct 14	TM			11 Discussion session	Ultrasound
	Oct 16	TM		Lab 2 due	12 Discussion session	Ultrasound
week 8	Oct 21	TM			13 Discussion session	Ultrasound
	Oct 23	TM	A4 out	A3 due	14 Laboratory 3	Ultrasound
week 9	Oct 28	IG			15 Discussion session	Nuclear Medicine
	Oct 30	IG			16 Discussion session	Nuclear Medicine
week 10	Nov 4	IG		Lab 3 due	17 Discussion session	Nuclear Medicine
	Nov 6	IG			18 Discussion session	Nuclear Medicine
week 11	Nov 13	IG			19 Discussion session	Nuclear Medicine
week 12	Nov 18	JY	A5 out	A4 due	20 Discussion session	MRI
	Nov 20	JY			21 Discussion session	MRI
week 13	Nov 25	JY			22 Discussion session	MRI
	Nov 27	JY			23 Discussion session	MRI
Week 14	Dec 2			A5, report due	24 Discussion session	MRI

	Dec 4			25	Student presentations	
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### Marking Scheme

Participation	25%	in class
Assignments	25%	5% x 5 assignments
Laboratory	30%	10% x 3 labs
Project	20%	1 report (10%) + talk (10%)

#### Participation

The “in-class” component of the course is organized as a discussion session. Each week prior to the discussion session you will be assigned relevant reading material for that days discussion. As well, you will be given “sample questions” that may be asked of you in the discussion session. You will be responsible for all the assigned reading. During each session you will be called on to answer questions / explain concepts / draw diagrams of equipment etc from the assigned sections for that given week. The questions asked by the instructors will form the “seeds” for the discussion sessions.

Marking for the discussion session component will be undertaken by the instructor leading the discussion session and will be based on your level of preparation for each session, comprehension of material, and initiative in the session.

#### Assignments

1 assignment in each of the main sections (radiography, CT, MRI, ultrasound, nuclear medicine). Each assignment is worth 5% of the total mark.

#### Labs

3 labs to be completed (radiography, CT, ultrasound). Lab time is scheduled during course hours. Data for each lab will be collected in groups. The analysis and lab write-up is to be performed individually. Lab write-ups should be no more than 5 pages (adhere to length restrictions!) and should consist of the following components:

- I. abstract: brief summary of the experiment. State relevant results.
- II. Introduction: state brief background to the experiment. May state relevant theory here. State objective of experiment.
- III. Theory: if not stated in (II), state theory required to perform experiment. This should be concise, yet cover what is needed.
- IV. Materials and Methods: state equipment used, how it was set-up, and methods used in experiment. Others reading the report should be able to reproduce your experiment and results based on the materials and methods described in this section.
- V. Results: state main results of experiment. Include tables, plots etc.
- VI. Discussion: summarize (synthesize) main results. Do they make sense? Answer any questions posed in lab hand-out material.
- VII. Conclusions: Summarize experiment and main results.
- VIII. References: include any references other than lab hand-outs.

#### Project + talk

A list of topics for the project is provided. You can choose a topic from the list, or come up with your own topic. However, the topic must concentrate on an “emerging technique / technology” in medical imaging, i.e. it can not be a review of basic modalities. Let one of the instructors know your choice of topic before you start your research. The report is to be an “abstract” of 3 pages in length (not more!!) summarizing the scope of your talk. Talks are 1/2 hr in length and are to be held in the last week of class.

Your abstract and talk should be based on research presented in recent published papers on your chosen topic. Your abstract should include references to the papers that your work is based on.

**Project Topics:**

1. Real-time tracking of diaphragm motion using on-board imaging.
2. Computer aided diagnosis and detection (CAD) systems for mammography.
3. Cone beam CT.
4. Deformable fusion of MR and CT images
5. Targeted contrast enhanced ultrasound for diagnostic imaging.
6. Ultrasound for image guided radiation therapy.
7. Beyond FDG, novel PET tracers for cancer imaging.