

### Content

<b>Core courses</b> .....	2
<b>Specialization electives</b> .....	2
Specialization electives for MI track – Eindhoven University (TU/e).....	2
Specialization electives for MI track – Utrecht University (UU) .....	2
<b>Suggestions for free space</b> .....	3
Master level .....	3
Specialization electives in the lab .....	3
Electives given by faculty from other departments .....	4
Bachelor level.....	4

<b>Medical Engineering – MI</b>	
Core	20 ec
Specialization electives *)	20 ec
Free space	15 ec
Externship	20 ec
Graduation project	45 ec

\*) Minimum 5 EC TU/e and 5 EC UU

### Core courses

Code	Course name	Lecturer	Q/TS	EC
8FM20	Clinical module 1 – Diagnostics and monitoring (dependent on # participants) <ul style="list-style-type: none"> <li>Neurology (8FM21)</li> <li>Radiology (8FM22)</li> </ul> IC (8FM23)		1 or 3 / <b>DD</b>	7.5
8FM30	Clinical module 2 – Decision and intervention (dependent on # participants) <ul style="list-style-type: none"> <li>Heart &amp; vessels (8FM31)</li> <li>Oncology (8FM32)</li> <li>Orthopaedics (8FM33)</li> </ul> Clinical chemistry – Catharina Hospital (8FM34)		1 or 3 / <b>DD</b>	7.5
8DM10	Team challenge in medical imaging	Veta	1+2+3/..	5

**DD** = Whole Tuesday and Thursday in Maastricht during Q1/Q3; project runs until halfway Q2/Q4

### Specialization electives

#### Specialization electives for MI track – Eindhoven University (TU/e)

Code	Course name	Lecturer	Q/TS	EC
8CM10	Radiation physics	Raaijmakers	1/A <b>a)</b>	2.5
8DM50	Machine learning in Medical Imaging and Biology	Veta	1/B	5
8NM00*	Radioisotopes and ionizing radiation in biochemical technology <b>CFK)</b>	Moerdijk	2/B	2.5
8VM60	Ultrasound in the (bio)medical engineering	Lopata	2/D	5
8VM70+	Advanced topics in Ultrasound imaging in the (bio)medical engineering	Lopata	2/D	2.5
5LPE0	Electromagnetic fields in MRI	Raaijmakers	2/C	5
8DM20	Capita selecta medical image analysis	Pluim	3/A+B <b>b)</b>	5
8NM20	Optical microscopy***	Albertazzi	4/C	5

#### Specialization electives for MI track – Utrecht University (UU)

Code	Course name	Lecturer	Q/TS	EC
8UU00	Programming for medical imaging (BMB502417)	Kuijf	1/C+D	5
8UU22	AI for Medical Imaging (BMB4708022)	Maspero	2	2.5
8UU23	Diffusion MRI (BMB4709022)	Leemans	2	2.5
8UU02	Advanced MR Physics 1 (BMB502717)	Bartels	2/A+E	5
8UU24	Image-guided ultrasound therapy (BMB4710022)		3	2.5
8UU03	Advanced MR Physics 2 (BMB503317)	Siero	3/C+D	5
8UU04	Radiotherapy Physics (BMB502617)	Van Asselen	3/B+D	5

\* = Limited number of spots

**CFK)** = 8NM00 students in the "Fysica in de kliniek" certificate fill the first spots

+ = If you already did 8VC00

\*\*\* = 8NM20 **or** 3MN210 (not both)

**a)** = Only on Monday

**b)** = Lectures on Monday only and BZ on Monday afternoon

**Q** = Quarter    **TS** = Time slot    **EC** = Credit points based on → European Credit Transfer System (ECTS)

### Suggestions for free space

#### Master level

Code	Course name	Lecturer	Dep		EC
8MM40	Cell mechanobiology and engineering	Kurniawan	BME	1/A	5
8VM00	Cardiovascular fluid mechanics	Van de Vosse	BME	1/B	5
8SM00	Clinical chemistry	Scharnhorst	BME	1/B1	2.5
8SM50	Chemical Biology	Cossar	BME	1/D	5
8CM20	Molecular modelling	Markvoort	BME	2/A	5
8MM50	Host response to biomaterials	Smits	BME	2/B	5
8MM30	Numerical analysis of continua II	Loerakker	BME	2/C	5
8SM10	Protein engineering	Merkx	BME	2/D	2.5
8TM10	Orthopaedic soft tissues: biomechanics and mechanobiology	Ito	BME	2/D	5
3MN170	Molecular biosensing	De Jong	AP	2/E	5
8VM30	Vascular mechanics	Rutten	BME	2/E	5
8TM00	Bone structure and function	Van Rietbergen	BME	3/B	5
8SM30	Capita selecta laboratory medicine	Scharnhorst	BME	3/B1	2.5
8CM00	Systems medicine	O'Donovan	BME	3/B2	5
8SM20	Biomaterials	Dankers	BME	3/C	5
8VM20	Cardiac function	Bovendeerd	BME	3/D	5
6EMA61	Advances in molecular chemistry	Palmans	CEC	3/E	5
8SM40*	Nanomedicine	Van der Meel	BME	4/A	5
3MN210	Single molecule microscopy of nano materials ***	De Jong	AP	4/C	5
8VM40	Cardiovascular fluid-structure interaction	Van de Vosse	BME	4/D	5
8CM30	Applied clinical data science	Van Riel	BME	4/E	2.5
8GM00	Career development	Pril	BME	all	2.5
8ZM91	Extending graduation project		BME		15
8ZM92	Extending graduation project		BME		10
8ZM97	Extending extern/internship		BME		5
8ZM98	Extending extern/internship		BME		10
8ZM99	Extending extern/internship		BME		15

#### Specialization electives in the lab

Code	Course name	Lecturer	Q/TS	EC
8PM00*	Project Molecular biology**	Merkx	1/\$	5
8MM20*	Cell biological techniques and cell-biomaterial interactions**	De Boer	2/\$	5
8PM01*	Project Organic chemistry	Meijer	4/C+E	5

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\*\* = 8MM20 **or** 8PM00 (not both)

\*\*\* = 8NM20 **or** 3MN210 (not both)

\$ = Individually planned by lecturer

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# Master electives list Medical Engineering

(2024-2025)

Medical Imaging track

## Electives given by faculty from other departments

Code	Course name	Lecturer	Dep	EC
0LM120	Perspectives on medical technology	Dennis	IEIS	5
0LM140	Let's make humans better	Frank	IEIS	5
1ZM16	Management of product development	Sihag	IEIS	5
1ZM90	Open innovation	Mahdad	IEIS	5
2IPC0	Programming methods	Cleophas	MCS	5
2IX20	Software specification	Keiren	MCS	5
2MMA80	Mathematics of neural networks <sup>#</sup>	Mula Hernández	MCS	5
3MA100	Physics behind medical technology: equipment and physiology	Van Pul	AP	5
4CM00	Control engineering	Witvoet	MECH	5
4LM50	Rheology/Computational rheology	Cardinaels	MECH	5
4MM20	Computational and experimental micro-mechanics	Hoefnagels	MECH	5
4UM00*	Microfabrication methods	Den Toonder	MECH	5
5LSB0	Monitoring respiration and circulation	Woerlee	EE	5
5LSC0	Biomedical sensing technology (indien 8VB10 niet is gedaan)	Mischi	EE	5
5SSC0	Adaptive array signal processing	Van Sloun	EE	5
5SSD0	Bayesian machine learning and information processing	De Vries	EE	5
6EMA51	Characterization of materials	Friedrich	CEC	5
6EMA53	Molecular photophysics	Janssen	CEC	5
6MSM10	Physical organic chemistry	Sijbesma	CEC	5
6MSM31	Polymer and colloid science	Tuinier	CEC	5

<sup>#</sup> = Please note the assumed pre-knowledge in Osiris

\* = Limited number of spots

## Bachelor level

Maximum 15 EC bachelor level 3 courses; check Osiris if they are taught in English or Dutch

Code	Course name	Lecturer	Q/TS	EC
8RC00	Pharmacology	Brunsveld	1/A	5
8TB10	Structure and function of joints	Ito	1/A	5
2DBM90	Applied biostatistical modelling	Morris	2/A	5
8BM030	BOC – Bio-organic chemistry	Dankers	2/D	5
8VC00	Advanced imaging techniques	Lopata	2/D	5
8LC00	Applied cell biology	De Boer	1/A	5
6BER02	MOC - Macro organic chemistry	Palmans	2/A	5
8P340	Project Biomechanics	Van de Vosse	3/B	5
8P380	Project Lab on chip	Gumuscu Sefunc	3/B	5
8CB10	Simulation biochemical systems	De Greef	3/C	5
8TC20	Basic tissue engineering	Dias Castilho	3/C	5
8P350	Project Tissue engineering	Smits	3/D	5
8P361	Project Imaging	Veta	3/E	5
8BE030	Medical image analysis	Scannell	4/A	5
8BE040	Cardiovascular pathophysiology	Bovendeerd	4/A	5
8P313	Instrumental analysis	Abdelmohsen	4/A	5
8CB20	System estimation & control for biology	De Greef	4/B	5

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