

# Biomedical Engineering, M Sc in Engineering

300 credits

Civilingenjör i medicinsk teknik

6CMED

Valid from: 2014 Spring semester

**Determined by** 

Board of Studies for Electrical Engineering, Physics and Mathematics

**Date determined** 

# **Entry requirements**

Degree in Swedish Civilingenjör 300 hp och Teknologie master 120 hp



3 (12)

# Curriculum

# Semester 6 (Spring 2017)

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TBMT41	Project - Biomedical Engineering	16*	G2X	3	С
TVFA02	Medical Radiation Physics	8*	G2X	2	С
Period 2					
TBMT41	Project - Biomedical Engineering	16*	G2X	3	С
TSRT19	Automatic Control	6	G2X	1	С
TVFA02	Medical Radiation Physics	8*	G2X	2	С

# Semester 7 (Autumn 2017)



Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TANA21	Scientific Computing	6	G1F	3	Е
TAOP88	Engineering Optimization	6	G2F	1	Е
TATM38	Mathematical Models in Biology	6	A1N	3	E
TBMI19	Medical Information Systems	6*	A1N	2	Е
TFYA47	Surfaces and Interfaces	6	A1X	2	E
TFYA88	Additive Manufacturing: Tools, Materials and Methods	6	A1N	3	E
THFR05	Communicative French	6*	G1X	4	E
THSP05	Spanish	6*	G1X	4	E
THTY05	German	6*	G1X	4	E
TSBB06	Multidimensional Signal Analysis	6*	A1X	2	E
TSDT14	Signal Theory	6	A1X	1	E
Period 2					
TBMI19	Medical Information Systems	6*	A1N	3	E
TBMT01	Biomedical Signal Processing	6	A1F	1	E
TEAE01	Industrial Economics, Basic Course	6	G1X	2	Е
TFFY70	Physics of Condensed Matter part I	6	A1X	2	E
TGTU49	History of Technology	6	G1F	3	E
THFR05	Communicative French	6*	G1X	4	E
THSP05	Spanish	6*	G1X	4	Е
THTY05	German	6*	G1X	4	E
TKMJ24	Environmental Engineering	6	G1X	3	E
TMMS07	Biomechanics	6	A1X	4	E
TSBB06	Multidimensional Signal Analysis	6*	A1X	3	E
TSBB09	Image Sensors	6	A1X	4	Е
TSRT78	Digital Signal Processing	6	A1X	2	E



5 (12)

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TSBB06	Multidimensional Signal Analysis	6*	A1X	2	С
TSDT14	Signal Theory	6	A1X	1	С
TANA21	Scientific Computing	6	G1F	3	E
TATM38	Mathematical Models in Biology	6	A1N	3	E
Period 2					
TBMT01	Biomedical Signal Processing	6	A1F	1	С
TSBB06	Multidimensional Signal Analysis	6*	A1X	3	С
TSBB09	Image Sensors	6	A1X	4	E
TSRT78	Digital Signal Processing	6	A1X	2	E

# $Special is at ion: Biomedical\ Materials$

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TFYA47	Surfaces and Interfaces	6	A1X	2	С
TAOP88	Engineering Optimization	6	G2F	1	Е
TATM38	Mathematical Models in Biology	6	A1N	3	Е
Period 2					
TFFY70	Physics of Condensed Matter part I	6	A1X	2	С
TFYA37	Soft Condensed Matter Physics	6	A1X	1	С
TMMS07	Biomechanics	6	A1X	4	E



#### Specialisation: Biomedical Modelling

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TBMI19	Medical Information Systems	6*	A1N	2	С
TSDT14	Signal Theory	6	A1X	1	С
TATM38	Mathematical Models in Biology	6	A1N	3	Е
Period 2					
TBMI19	Medical Information Systems	6*	A1N	3	С
TBMT01	Biomedical Signal Processing	6	A1F	1	С
TMMS07	Biomechanics	6	A1X	4	E

# Semester 8 (Spring 2018)

Period 1TAOP07Introduction to Optimization6G1F3ETATA53Linear Algebra, Honours Course6*G2F-ETBMI01Medical Decision Support6A1X4ETBMI03Medical Information Models and Ontologies6A1X4ETBMI26Neural Networks and Learning Systems6A1N2ETBMT02Medical Imaging6A1F3ETBMT09Physiological Pressures and Flows6A1N1ETEIO20Entrepreneurship and New Business Development6*G2X4ETFFM40Analytical Methods in Materials Science6*A1X1ETFYA21Physical Metallurgy6A1F3ETFYA85Alternative Energy Sources and their Applications6G2X4ETGTU01Technology and Ethics6G1X1ETHEN18English6*G1N4ETHSP05Spanish6*G1X4ETHTY05German6*G1X4ETKMJ15Environmental Management Strategies6G1F3E	Course code	Course name	Credits	Level	Timetable module	ECV
TATA53 Linear Algebra, Honours Course 6* G2F - E TBMI01 Medical Decision Support 6 A1X 4 E TBMI03 Medical Information Models and Ontologies 6 A1X 4 E TBMI26 Neural Networks and Learning Systems 6 A1N 2 E TBMT02 Medical Imaging 6 A1F 3 E TBMT09 Physiological Pressures and Flows 6 A1N 1 E  TEIO20 Entrepreneurship and New Business Development 6* G2X 4 E  TFFM40 Analytical Methods in Materials Science 6* A1X 1 E  TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G1X 1 E  THEN18 English 6* G1X 4 E  THEN18 English 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	Period 1					
TBMI01 Medical Decision Support 6 A1X 4 E  TBMI03 Medical Information Models and Ontologies 6 A1X 4 E  TBMI26 Neural Networks and Learning Systems 6 A1N 2 E  TBMT02 Medical Imaging 6 A1F 3 E  TBMT09 Physiological Pressures and Flows 6 A1N 1 E  TEIO20 Entrepreneurship and New Business Development 6* G2X 4 E  TFFM40 Analytical Methods in Materials Science 6* A1X 1 E  TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G1X 1 E  THEN18 English 6* G1X 4 E  THEN18 English 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	TAOP07	Introduction to Optimization	6	G1F	3	Е
TBMI03 Medical Information Models and Ontologies 6 A1X 4 E  TBMI26 Neural Networks and Learning Systems 6 A1N 2 E  TBMT02 Medical Imaging 6 A1F 3 E  TBMT09 Physiological Pressures and Flows 6 A1N 1 E  TEIO20 Entrepreneurship and New Business Development 6* G2X 4 E  TFFM40 Analytical Methods in Materials Science 6* A1X 1 E  TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G1X 1 E  THEN18 English 6* G1X 4 E  THFR05 Communicative French 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	TATA53	Linear Algebra, Honours Course	6*	G2F	-	E
TBMI26 Neural Networks and Learning Systems 6 A1N 2 E  TBMT02 Medical Imaging 6 A1F 3 E  TBMT09 Physiological Pressures and Flows 6 A1N 1 E  TEIO20 Entrepreneurship and New Business Development 6* G2X 4 E  TFFM40 Analytical Methods in Materials Science 6* A1X 1 E  TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G1X 1 E  THEN18 English 6* G1X 1 E  THEN18 English 6* G1X 4 E  THFR05 Communicative French 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E	TBMI01	Medical Decision Support	6	A1X	4	Е
TBMT02 Medical Imaging 6 A1F 3 E  TBMT09 Physiological Pressures and Flows 6 A1N 1 E  TEIO20 Entrepreneurship and New Business Development 6* G2X 4 E  TFFM40 Analytical Methods in Materials Science 6* A1X 1 E  TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G1X 1 E  TGTU01 Technology and Ethics 6 G1X 1 E  THEN18 English 6* G1N 4 E  THFR05 Communicative French 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	TBMI03	Medical Information Models and Ontologies	6	A1X	4	E
TBMT09 Physiological Pressures and Flows 6 A1N 1 E  TEIO20 Entrepreneurship and New Business Development 6* G2X 4 E  TFFM40 Analytical Methods in Materials Science 6* A1X 1 E  TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G2X 4 E  TGTU01 Technology and Ethics 6 G1X 1 E  THEN18 English 6* G1N 4 E  THFR05 Communicative French 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	TBMI26	Neural Networks and Learning Systems	6	A1N	2	E
TEIO20 Entrepreneurship and New Business Development  TFFM40 Analytical Methods in Materials Science  6* A1X 1 E  TFYA21 Physical Metallurgy  6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications  6* G2X 4 E  THEN18 English  6* G1X 1 E  THFR05 Communicative French  6* G1X 4 E  THSP05 Spanish  6* G1X 4 E  THTY05 German	TBMT02	Medical Imaging	6	A1F	3	Е
TFFM40 Analytical Methods in Materials Science 6* A1X 1 E  TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G2X 4 E  TGTU01 Technology and Ethics 6 G1X 1 E  THEN18 English 6* G1N 4 E  THFR05 Communicative French 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	ТВМТ09	Physiological Pressures and Flows	6	A1N	1	E
TFYA21 Physical Metallurgy 6 A1F 3 E  TFYA85 Alternative Energy Sources and their Applications 6 G2X 4 E  TGTU01 Technology and Ethics 6 G1X 1 E  THEN18 English 6* G1N 4 E  THFR05 Communicative French 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	TEIO20	·	6*	G2X	4	E
TFYA85 Alternative Energy Sources and their Applications  6 G2X 4 E  TGTU01 Technology and Ethics 6 G1X 1 E  THEN18 English 6* G1N 4 E  THFR05 Communicative French 6* G1X 4 E  THSP05 Spanish 6* G1X 4 E  THTY05 German 6* G1X 4 E	TFFM40	Analytical Methods in Materials Science	6*	A1X	1	E
TGTU01         Technology and Ethics         6         G2X         4         E           THEN18         English         6*         G1X         1         E           THFR05         Communicative French         6*         G1X         4         E           THSP05         Spanish         6*         G1X         4         E           THTY05         German         6*         G1X         4         E	TFYA21	Physical Metallurgy	6	A1F	3	Е
THEN18         English         6*         G1N         4         E           THFR05         Communicative French         6*         G1X         4         E           THSP05         Spanish         6*         G1X         4         E           THTY05         German         6*         G1X         4         E	TFYA85		6	G2X	4	E
THFR05         Communicative French         6*         G1X         4         E           THSP05         Spanish         6*         G1X         4         E           THTY05         German         6*         G1X         4         E	TGTU01	Technology and Ethics	6	G1X	1	Е
THSP05         Spanish         6*         G1X         4         E           THTY05         German         6*         G1X         4         E	THEN18	English	6*	G1N	4	E
THTY05 German 6* G1X 4 E	THFR05	Communicative French	6*	G1X	4	Е
	THSP05	Spanish	6*	G1X	4	E
TKMJ15 Environmental Management Strategies 6 G1F 3 E	THTY05	German	6*	G1X	4	E
	TKMJ15	Environmental Management Strategies	6	G1F	3	E



Course code	Course name	Credits	Level	Timetable module	ECV
TSBB15	Computer Vision	12*	A1X	1	E
TSBK07	Computer Graphics	6*	A1X	4	E
Period 2					
TATA53	Linear Algebra, Honours Course	6*	G2F	-	E
TBME08	Biomedical Modeling and Simulation	6	A1N	3	E
TBMT26	Technology in Intensive Care and Surgery	6	A1N	1	E
TDDD74	Databases for Bioinformatics	6	G2X	4	E
TEIO20	Entrepreneurship and New Business Development	6*	G2X	4	E
TFFM40	Analytical Methods in Materials Science	6*	A1X	1	E
TFMT19	Chemical Sensor Systems	6	A1X	4	E
THEN18	English	6*	G1N	4	E
THFR05	Communicative French	6*	G1X	4	E
THSP05	Spanish	6*	G1X	4	E
THTY05	German	6*	G1X	4	E
TSBB15	Computer Vision	12*	A1X	3	E
TSBK02	Image and Audio Coding	6	A1X	4	E
TSBK07	Computer Graphics	6*	A1X	1	E



#### Specialisation: Biomedical Imaging and Visualization

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TBMT02	Medical Imaging	6	A1F	3	С
TSBK07	Computer Graphics	6*	A1X	4	С
TAOP07	Introduction to Optimization	6	G1F	3	E
TBMI26	Neural Networks and Learning Systems	6	A1N	2	Е
TBMT09	Physiological Pressures and Flows	6	A1N	1	E
TSBB15	Computer Vision	12*	A1X	1	Е
Period 2					
TSBK07	Computer Graphics	6*	A1X	1	С
TBME08	Biomedical Modeling and Simulation	6	A1N	3	E
TSBB15	Computer Vision	12*	A1X	3	E
TSBK02	Image and Audio Coding	6	A1X	4	E

#### Specialisation: Biomedical Materials

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TFFM40	Analytical Methods in Materials Science	6*	A1X	1	С
TFYA21	Physical Metallurgy	6	A1F	3	С
TBMT09	Physiological Pressures and Flows	6	A1N	1	E
Period 2					
TFFM40	Analytical Methods in Materials Science	6*	A1X	1	С
TFKE52	Fundamentals of Chemistry	6	G1X	1	С
TBME08	Biomedical Modeling and Simulation	6	A1N	3	E
TBMT26	Technology in Intensive Care and Surgery	6	A1N	1	E
TFMT19	Chemical Sensor Systems	6	A1X	4	E



#### Specialisation: Biomedical Modelling

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TBMT09	Physiological Pressures and Flows	6	A1N	1	С
TAOP07	Introduction to Optimization	6	G1F	3	E
TBMI01	Medical Decision Support	6	A1X	4	E
TBMI03	Medical Information Models and Ontologies	6	A1X	4	Е
TBMI26	Neural Networks and Learning Systems	6	A1N	2	E
TBMT02	Medical Imaging	6	A1F	3	E
Period 2					
TBME08	Biomedical Modeling and Simulation	6	A1N	3	С
TBMT26	Technology in Intensive Care and Surgery	6	A1N	1	E
TDDD74	Databases for Bioinformatics	6	G2X	4	E

# Semester 9 (Autumn 2018)



Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TAMS39	Multivariate Statistical Methods	6	A1N	4	Е
TBMT14	Biomedical Engineering - Project Course	12*	A1F	4	E
TBMT36	Biomedical Optics	6	A1X	1	E
TDDC17	Artificial Intelligence	6	G2F	3	E
TFFM08	Experimental Physics	6*	A1X	1	E
TFYA43	Nanotechnology	6	G2X	3	E
TFYA47	Surfaces and Interfaces	6	A1X	2	E
TFYA92	Project Course in Applied Physics, CDIO	12*	A1X	4	E
TNM067	Scientific Visualization	6	A1X	3	E
TSBB08	Digital Image Processing	6	A1X	4	Е
TSBB11	Images and Graphics, Project Course CDIO	12*	A1X	4	Е
Period 2					
TBMI02	Medical Image Analysis	6	A1N	1	Е
TBMT14	Biomedical Engineering - Project Course	12*	A1F	4	E
TFFM08	Experimental Physics	6*	A1X	1	E
TFYA30	Supramolecular Chemistry	6	A1X	1	E
TFYA92	Project Course in Applied Physics, CDIO	12*	A1X	4	Е
TGTU04	Leadership	6	G2X	2	E
TNM086	Virtual Reality Techniques	6	A1X	2	E
TSBB11	Images and Graphics, Project Course CDIO	12*	A1X	4	E



#### Specialisation: Biomedical Imaging and Visualization

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TSBB11	Images and Graphics, Project Course CDIO	12*	A1X	4	С
TAMS39	Multivariate Statistical Methods	6	A1N	4	E
TBMI19	Medical Information Systems	6*	A1N	2	E
ТВМТ36	Biomedical Optics	6	A1X	1	E
TDDC17	Artificial Intelligence	6	G2F	3	E
TNM067	Scientific Visualization	6	A1X	3	E
TSBB08	Digital Image Processing	6	A1X	4	E
Period 2					
TBMI02	Medical Image Analysis	6	A1N	1	С
TSBB11	Images and Graphics, Project Course CDIO	12*	A1X	4	С
TBMI19	Medical Information Systems	6*	A1N	3	E
TNM086	Virtual Reality Techniques	6	A1X	2	Е

# $Special is at ion: Biomedical\ Materials$

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TFYA47	Surfaces and Interfaces	6	A1X	2	С
TBMT14	Biomedical Engineering - Project Course	12*	A1F	4	C/E
TFYA92	Project Course in Applied Physics, CDIO	12*	A1X	4	C/E
TBMT36	Biomedical Optics	6	A1X	1	E
TFYA43	Nanotechnology	6	G2X	3	E
Period 2					
TFYA30	Supramolecular Chemistry	6	A1X	1	С
TBMT14	Biomedical Engineering - Project Course	12*	A1F	4	C/E
TFYA92	Project Course in Applied Physics, CDIO	12*	A1X	4	C/E



Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TBMT14	Biomedical Engineering - Project Course	12*	A1F	4	С
TBMT36	Biomedical Optics	6	A1X	1	С
TAMS39	Multivariate Statistical Methods	6	A1N	4	E
TDDC17	Artificial Intelligence	6	G2F	3	Е
TSBB06	Multidimensional Signal Analysis	6*	A1X	2	E
Period 2					
TBMT14	Biomedical Engineering - Project Course	12*	A1F	4	С
TBMI02	Medical Image Analysis	6	A1N	1	E
TSBB06	Multidimensional Signal Analysis	6*	A1X	3	E

# Semester 10 (Spring 2019)

Course code	Course name	Credits	Level	Timetable module	ECV
Period 1					
TQXX33	Degree project - Master's Thesis	30*	A1X	=	С
Period 2					_
TQXX33	Degree project - Master's Thesis	30*	A1X	-	С



ECV = Elective / Compulsory /Voluntary
\*The course is divided into several semesters and/or periods