



<b>Semester</b>	<b>4</b>	Thesis (40)			
	<b>3</b>	Specialization Topics (20)			
	<b>2</b>	Music Perception 2 (5)	Music Processing (5+5)	Seminar (5+5)	Research Methods (5+5)
	<b>1</b>	Music Perception 1 (5)			
<b>1</b>	Music Psychology 2 (5)	Sound Processing 2 (5)			
		Music Psychology 1 (5)	Sound Processing 1 (5)		

## 1. PROGRAMME DESCRIPTION

Music, Mind and Technology is a master's degree program, which consists of 120 ECTS credits and requires two academic years of full-time study.

After completing the Music, Mind, and Technology Master's programme the student will be:

- familiar with the key topics of contemporary research on music perception and cognition
- able to employ various methods and equipment used in music industry
- capable of designing, executing, and reporting empirical research
- acquainted with knowledge and skills needed for PhD studies

## 2. MMT STUDY UNITS

### *MMTS011 Music Psychology I (5 ECTS)*

**Learning Outcomes:** After completing the course, the student is able to:

- describe psychological processes related to areas such as musical skill development, musical preferences, music and personality, music and movement, music and emotion, and the social psychology of music
- critically evaluate, compare, and summarize various theoretical propositions and empirical studies related to psychological and social aspects of musical behaviour

**Contents:** The course is a survey on the main sub-fields of music psychology research. The course features guest lectures given by several of the researchers within the Music Department. Thus, the course also introduces students to the department's research strategy.

**Modes of study:** Lectures; literature;

**Completion modes:** learning diary, exam

**Learning materials:**

- S. Hallam, I. Cross & M. Thaut (eds.) (2009). *Oxford Handbook of Music Psychology*. OUP. New York.
- W. F. Thompson (2009). *Music, thought, and feeling. Understanding the psychology of music*. OUP: New York.
- P. N Juslin & J. A. Sloboda (Eds.) (2001), *Music and Emotion: Theory and Research*. New York: Oxford University Press. / Juslin, P. N. & Sloboda, J. A. (Eds.) (2009). *Handbook of Music and Emotion: Theory, Research, Applications*. Oxford: OUP.
- North, A. C. & Hargreaves, D. J. (Eds.) (1997). *The Social Psychology of Music*. London; O.U.P.

**Scheduling:** 1<sup>st</sup> Semester

**Assessment:** 0-5

### *MMTS012 Music Psychology II (5 ECTS)*

**Learning Outcomes:** After completing the course, the student is able to:

- independently gather and synthesize information from self-chosen music psychological topics
- construct an overview of the various theoretical propositions and empirical studies related to these topics
- discuss the chosen topics from the viewpoints of their relevance to the field, possible applications, and research questions
- present the above-mentioned both orally and in writing
- gain experience in designing and carrying out a small-scale research experiment

**Contents:** Students select a topic to focus on for the duration of the course. The first assignment is to give a group presentation and produce a short paper in which they compare and contrast two seminal research papers on a topic related to music psychology. The second assignment is to focus on one seminal paper and attempt to reproduce the paper's results through a similar methodology. The results of this assignment are given in an oral presentation and lab report essay.

**Modes of study:** literature; group presentations; essay

**Completion modes:** group presentations; essay

**Learning Materials:**

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- S. Hallam, I. Cross & M. Thaut (eds.) (2009). Oxford Handbook of Music Psychology. OUP. New York.
- W. F. Thompson (2009). Music, thought, and feeling. Understanding the psychology of music. OUP: New York.
- P. N Juslin & J. A. Sloboda (Eds.) (2001), Music and Emotion: Theory and Research. New York: Oxford University Press. / Juslin, P. N. & Sloboda, J. A. (Eds.) (2009). Handbook of Music and Emotion: Theory, Research, Applications. Oxford: OUP.
- North, A. C. & Hargreaves, D. J. (Eds.) (1997). The Social Psychology of Music. London; O.U.P.

**Scheduling:** 1<sup>st</sup> Semester

**Assessment:** 0-5

***MMTS021 Music perception I (5 ECTS)***

**Learning Outcomes:** After completing the course the student is able to:

- describe main research areas and key findings in music perception research
- understand key issues that govern the cognitive processes involved in music perception and production
- understand the basics of main methodologies used to study music perception

**Contents:** The course is a survey on the main sub-fields of music perception research.

**Modes of study:** Lectures; group work; demonstrations; private study;

**Completion modes:** written assignments; exam

**Learning Materials:**

- W. F. Thompson (2009). Music, thought, and feeling. Understanding the psychology of music. OUP: New York.
- P.R. Cook (Ed). (1999). Music cognition and computerized sound. An introduction to psychoacoustics. The MIT Press: Cambridge, MA.

**Scheduling:** 2<sup>nd</sup> Semester

**Assessment:** 0-5

***MMTS022 Music perception II (5 ECTS)***

**Learning outcomes:** After completing the course the student is able to:

- apply a data collection and analysis method to study a question related to music perception
- report the results of an experiment

**Contents:** In groups of 2-3, students design, carry out, and report an original research project.

**Modes of study:** Group work; private study; written assignments; oral presentation

**Completion modes:** oral presentations; research report

**Learning Materials:**

- W. F. Thompson (2009). Music, thought, and feeling. Understanding the psychology of music. OUP: New York.
- P.R. Cook (Ed). (1999). Music cognition and computerized sound. An introduction to psychoacoustics. The MIT Press: Cambridge, MA.

**Scheduling:** 2<sup>nd</sup> Semester

**Assessment:** 0-5

***MMTS041 Sound Processing I (5 ECTS)***

**Learning outcome:** After completing the course the student is able to:

- understand basic theoretical issues related to digital sound, including MIDI, sequencer, notation, digital sound recording and editing, sound analysis, synthesis and manipulation
- apply this knowledge in various areas of sound processing
- create objects of digital music for artistic, educational or research purposes

**Contents:** Introduction to studio hardware and software for music recording

**Modes of study:** Demonstrations; lab work

**Completion modes:** TBA

**Learning materials:**

- David Williams & Peter Webster, *Experiencing Music Technology*, 2<sup>nd</sup> Ed, 1999.
- Peter Manning, *Electronic and Computer Music*, Oxford University Press, 2004 (JYU Ebrary)
- Russ Haines, *Digital Audio*, 2001 (JYU Ebrary)

**Scheduling:** 1<sup>st</sup> Semester

**Assessment:** 0-5

***MMTS042 Sound Processing II (5 ECTS)***

**Learning outcome:** After completing the course the student is able to:

- apply knowledge on music technology for research purposes
- understand the basics of development environments for music and multimedia
- manage music technological hardware and software

**Contents:** Introduction to audio analysis software (MATLAB MirToolbox & Max/

**Modes of study:** Demonstrations; group work; lab work; project

**Completion modes:** assignments; project

**Learning materials:**

- MIRToolbox Manual, Max online tutorials, prepared tutorials

**Scheduling:** 1<sup>st</sup> Semester

**Assessment:** 0-5

***MMTS045 Music Processing (10 ECTS)***

**Learning outcome:** After completing the course the student:

- understands advanced theoretical issues related to analysis, manipulation, and synthesis of musical sound
- can apply this understanding in various areas of sound processing
- understands the basics of development environments for music and multimedia
- can apply this understanding to create interactive music performance software

**Contents:** This module aims to familiarize students with advanced theoretical issues related to the analysis, manipulation, and synthesis of musical sound. Students become acquainted with the basics of algorithmic and interactive music systems as well as musical development environments. The module also includes practical work on advanced sound analysis, sound manipulation and sound synthesis, as well as development of interactive music systems.

**Modes of study:** Lectures; demonstrations; lab work.

**Completion modes:** TBA

**Scheduling:** 2<sup>nd</sup> Semester

**Assessment:** 0-5

***Specialization Topics (Total 20 ECTS)***

The Specialization Topic courses can be selected from the following options or they can be replaced by applicable studies offered by the Department of Music, other Departments of the University of Jyväskylä or other universities. The students will generally be required to take options that complement rather than repeat their previous training. Specialization Topics vary from year to year. Examples of such courses include:

*Music Information Retrieval* (course code TBA, 10 ECTS)

*Music, culture, and cognition* (course code TBA, 10 ECTS)

*MMT Colloquium* (MMTS061, offered twice: 2 ECTS per semester)

*Contemporary Issues in Musicology* (MUSS851, 3 ECTS)

*Workshop on EEG Measurement and Analysis*, (MMTS056, 3 ECTS)

*Neuroscience Tools* (TILS810, 3 ECTS)

**Learning outcomes:** Vary.

**Contents:** Vary

**Modes of study:** Vary

**Completion modes:** Vary

**Learning Materials:** Vary

**Scheduling:** 3<sup>rd</sup> Semester

**Assessment:** 0-5

***MMTS060 Seminar (5+5 ECTS, consisting of Seminar, colloquium and Integrated Research Communication, XNX009)***

**Learning outcomes:** After completing the course the student is able to:

- understand the requirements for the planning, executing, and reporting of a scientific research project
- understand the basic principles of academic writing
- critically evaluate strengths and weaknesses of research projects
- communicate research findings both orally and in writing

**Contents:** Students choose a research topic for their thesis. In order to pass the course, the student is required to complete his/her Master's Thesis plan. The Seminar is composed of two separate modules worth 5 credits each: Seminar (MMTS060), and Integrated Research Communication (XENX009). The latter is offered by the Language Department. The timeslot of the Seminar is also used for a tutorial on the Optima system, and also for Information Retrieval tutorials (given by the University Library).

**Modes of study:** Preparation of personal study plan; lectures; seminar sessions; preparation of written reports; oral presentations

**Completion modes:** idea paper; contrast paper; annotated bibliography; literature review; final research proposal

**Learning Materials:** TBA

**Scheduling:** 1st and 2nd semesters

**Assessment:** 0-5

***MMTS070 & MMTS071 Research Methods (5+5 ECTS)***

**Learning outcomes:** After completing the course, the student is able to:

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- list and describe relevant research strategies, data collection methods, and data analysis methods for conducting empirical research in the field of music, mind, and technology.
- critically evaluate the adequacy, reliability, and validity of various research methods in exploring different types of research questions
- apply appropriate methods in conducting small data collection and data analysis tasks
- carry out a statistical analysis within the SPSS and/or MATLAB environments

**Contents:** This course introduces students to research methods needed to complete the Masters thesis. Topics cover scientific thinking, introduction to experimental design, and qualitative methods, with an introduction to statistics.

**Modes of study:** Lectures; literature; exercises; exam

**Completion Modes:** exercises; exam

**Literature:**

- Coolican, H. (2004). *Research Methods and Statistics in Psychology* (Fourth Edition). London, UK; Hodder & Stoughton.

**Scheduling:** 1<sup>st</sup> and 2<sup>nd</sup> semester

**Assessment:** 0-5

***MMTS080 Thesis (40 ECTS)***

**Learning outcomes:** After completing the Master's thesis the student is able to:

- plan and execute a personal research project
- synthesize and critically evaluate pertinent literature
- report a research project
- critically evaluate the results

**Modes of study:** Independent research work under the supervision of a designated supervisor; group supervision sessions

**Scheduling:** 3<sup>rd</sup> and 4<sup>th</sup> semester

**Assessment:** 0-5

### **3. LANGUAGE REQUIREMENT**

The MMT Programme includes one compulsory language course for all students, XENX009 Research Communication Skills (5 ECTS), which consists of writing skills and oral presentation skills and is integrated within the Seminar course.

In addition, students with native language other than Finnish are required to pass course level 2 in Finnish (i.e. courses XSU0005 Suomi 1 & XSU0006 Suomi 2). Further, it should be noted that Finnish students must fulfil the statutory requirements in Finnish and in Swedish if they wish to be qualified for civil servant (state) positions in Finland. These studies in Finnish and Swedish are in addition to the 120 ECTS MMT studies.

### **4. MATURITY EXAMINATION MUS0Y96 (1 ECTS)**

The maturity examination (in Finnish 'kypsyysnäyte' or 'maturiteetti') is a compulsory study attainment stipulated in the Degree Statute. According to the Statute, students have to complete a maturity examination in the field of their thesis. The maturity examination makes up part of the compulsory language and communication studies of the programme. The maturity examination is an essay-type paper, which assesses both the student's mastery of the subject and his/her language ability. Further information on the maturity exam is available from: <http://www.jyu.fi/hum/en/study/maturityexam>

### **5. MINOR IN COGNITIVE NEUROSCIENCE**

The Centre for Interdisciplinary Brain Research (CIBR) offers a Minor degree to students interested in pursuing neuroscience studies. Students must complete 30 credits from the curriculum defined by the CIBR. Participation will be determined at the time when students devise a personal study plan in September 2014.