MASTER’S PROGRAMME IN MUSIC COMMUNICATION AND TECHNOLOGY

Curriculum 2018–2019
Master of Philosophy in Music, Communication and Technology
Approved by the Faculty of Humanities April 2018
Department of Music

Duration: 2 years full-time (120 ECTS credits)
Degree: Master of Philosophy in Music, Communication and Technology

Learning outcomes
In this programme you will learn to use and develop music technological methods and tools, and reflect on how technology shapes human communication. You will be educated to use your music technology skills also in non-musical settings, taking on complex societal challenges in multidisciplinary teams.

Knowledge
The candidate
• has advanced knowledge in the interdisciplinary field of music technology, with specialized insights in technologies aimed at real-time (musical) communication
• has thorough knowledge of acoustics, music cognition, machine learning, and human-computer interaction
• can apply the knowledge to new areas, such as sonic interaction design, audiovisual communication, auditory displays, virtual reality, music information retrieval, and distributed multimedia systems
• can analyze academic problems on the basis of the historical development, technological limitations, cognitive foundations and aesthetic implications of music-related communication technologies

Skills
The candidate
• can analyze existing theories, methods and practices in music technology, and work independently, as well as in groups, on practical and theoretical problems in the field
• can use relevant technologies for sound and music-related research and development in an independent manner, such as motion capture systems and loudspeaker arrays
• can analyze and deal critically with various sources of information and use them to structure and formulate scholarly arguments in the field of music technology
• can carry out, under supervision, technically demanding research in interactive music, motion tracking, music-related machine learning, and spatial audio, in accordance with applicable norms for research ethics
• can design, develop and evaluate systems for music communication and interactive music, both independently and in teams

General competence
The candidate
• can contribute to new thinking and innovation processes
• can analyze relevant academic, professional and research ethical problems
• can apply her/his knowledge and skills within the interdisciplinary field of music technology to new areas, in order to carry out advanced assignments and projects

• can communicate extensive independent - and group - work, mastering the language and terminology in the field of music technology

• can communicate and discuss issues of music technology and communication with different groups and individuals; student peers, the general public, specialists in the field and industry partners

• can engage critically in debates of knowledge, research and practice in the field of music technology

Admission

Admission to master's degree studies requires:

• Higher Education Entrance Qualification and a completed bachelor's degree comparable to a Norwegian bachelor's degree. Applicants with foreign education, please refer to the country list.

• a specialization defined by the programme

• a minimum grade average of C (in the Norwegian grading scale) or equivalent from the specialization in your degree.

• a language requirement documented by one of the tests/exams below: a) Passed examination in English foundation course (140 hours/5 periods per week) with a minimum grade of 4 in Norwegian upper secondary school (or an equivalent grade from a Nordic upper secondary school) or passed examination in English from second and/or third school year in Norwegian upper secondary school, or b) An internationally recognised English language proficiency test.

Required specialization

• A bachelor degree in Arts and Humanities, Social Sciences, Informatics, or other similar field

Degrees in the required fields, may be organized differently at your university. We therefore accept applicants with relevant backgrounds, such as Music, Media Studies, Psychology, Neuroscience, Computer Science, Electrical Engineering, Multidisciplinary Studies, etc. A degree in Business Studies, Business English or Tourism will not qualify.

• The applicant will need to document knowledge and experience in both music and technology, such as:

  • Music: performance, composition, production, installation, theory, cognition, acoustics, sound design, and/or signal processing

  • Technology: musical programming (Max, Puredata, Csound, or similar), general programming (Matlab, Python, Java, C++, or similar), human-computer interaction, and/or electronics

Documentation

You have to upload all required documents in UiO's online application portal. In addition to the general documents required, you should also submit:

• A digital portfolio: The digital portfolio will be the basis of the assessment of your music technological competence. When you apply, you should therefore provide the link to a website (a personal page, Vimeo, YouTube, SoundCloud, etc.) with relevant material documenting your knowledge and skills relevant to the programme. The portfolio should include former projects, and
could be of both academic and artistic nature. If you include works that are produced together with others, it is important to clearly describe your contribution. There is no limit to the size of the portfolio, but the quality of the material is more important than the number of projects and files included.

• **Letter of motivation:** We ask all applicants to our programme to add a Letter of motivation where you elaborate on your interest in the programme, with reference to previous experiences from work and/or studies. The letter should be no more than two pages.

**Ranking of applicants**
Firstly, applicants are ranked according to their grade average in the specialization of their degree and their digital portfolio. Applicants who cannot be ranked according to their grade average, will be ranked on the basis of an individual assessment.

Secondly, applicants may be ranked on the basis of their motivation letter and interview. Based on the ranking, a selection of the qualified applicants will be invited to an online interview. A test may be included in the interview, in which case the applicant will be informed beforehand.

Please note that even if you fulfill the minimum grade requirement, this does not guarantee a study place in the programme. You normally cannot be admitted to a master's degree programme or study option within the same subject area as a previously completed master's degree at the University of Oslo or the Norwegian University of Science and Technology.

**Courses**

<table>
<thead>
<tr>
<th>Course codes</th>
<th>Course title</th>
<th>Credits</th>
<th>Semester</th>
<th>Restricted admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCT4000</td>
<td>Introduction to Music, Communication and Technology</td>
<td>15</td>
<td>Autumn</td>
<td>Yes 1)</td>
</tr>
<tr>
<td>MCT4010</td>
<td>Entrepreneurship</td>
<td>5</td>
<td>Autumn</td>
<td>No</td>
</tr>
<tr>
<td>MCT4021</td>
<td>Physical-Virtual communication and Music 1</td>
<td>5</td>
<td>Autumn</td>
<td>Yes 1)</td>
</tr>
<tr>
<td>MCT4022</td>
<td>Physical-Virtual communication and Music 2</td>
<td>5</td>
<td>Spring</td>
<td>Yes 1)</td>
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<tr>
<td>MCT4023</td>
<td>Physical-Virtual communication and Music 3</td>
<td>5</td>
<td>Autumn</td>
<td>Yes 1)</td>
</tr>
<tr>
<td>MCT4031</td>
<td>Applied MCT Project 1</td>
<td>10</td>
<td>Spring</td>
<td>Yes 1)</td>
</tr>
<tr>
<td>MCT4032</td>
<td>Applied MCT Project 2</td>
<td>10</td>
<td>Autumn</td>
<td>Yes 1)</td>
</tr>
<tr>
<td>MCT4043</td>
<td>Music-related Motion tracking</td>
<td>5</td>
<td>Spring</td>
<td>Yes 2)</td>
</tr>
<tr>
<td>MCT4044</td>
<td>Spatial audio</td>
<td>5</td>
<td>Autumn</td>
<td>Yes 2)</td>
</tr>
<tr>
<td>MCT4045</td>
<td>Interactive Music systems</td>
<td>5</td>
<td>Autumn</td>
<td>Yes 2)</td>
</tr>
<tr>
<td>MCT4046</td>
<td>Sonification and Sound design</td>
<td>5</td>
<td>Spring</td>
<td>Yes 2)</td>
</tr>
<tr>
<td>MCT4047</td>
<td>Music and Machine Learning</td>
<td>5</td>
<td>Autumn</td>
<td>Yes 2)</td>
</tr>
<tr>
<td>MCT4048</td>
<td>Audio Programming</td>
<td>5</td>
<td>Spring</td>
<td>Yes 2)</td>
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<tr>
<td>MCT4090</td>
<td>Master's thesis in Music, Communication and Technology</td>
<td>30</td>
<td>Spring</td>
<td>Yes 1)</td>
</tr>
</tbody>
</table>

1) Requires admission to the Master’s programme in Music Communication and Technology
2) Requires admission to Master of Music, Communication and Technology or Master in Music Technology at NTNU.
Programme structure

The Master's curriculum offered by MCT follows this structure:

- 60 credits compulsory courses
- 30 credits elective courses (or semester abroad)
- 30 credits Master’s thesis

Below follows an overview of the structure of the International Master in Music, Communication and Technology:

<table>
<thead>
<tr>
<th>Semester</th>
<th>10 ECTS Credits</th>
<th>10 ECTS Credits</th>
<th>10 ECTS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 S</td>
<td>MCT4090 - Master's thesis in Music, Communication and Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 A</td>
<td>MCT 4023 Physical-Virtual communication and Music 3</td>
<td>MCT4032 Applied MCT Project 2</td>
<td>Elective course</td>
</tr>
<tr>
<td>2 S</td>
<td>MCT 4022 Physical-Virtual communication and Music 2</td>
<td>MCT4031 Applied MCT Project 1</td>
<td>Elective course</td>
</tr>
<tr>
<td>1 A</td>
<td>MCT 4021 Physical-Virtual communication and Music 1</td>
<td>Entrepreneurship</td>
<td>MCT4010 - Research methods, tools and issues</td>
</tr>
</tbody>
</table>

For students going on Exchange there is an alternative structure:

<table>
<thead>
<tr>
<th>Semester</th>
<th>10 ECTS Credits</th>
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<th>10 ECTS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 S</td>
<td>MCT4090 - Master's thesis in Music, Communication and Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 A</td>
<td>Semester abroad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 S</td>
<td>MCT 4022 Physical-Virtual communication and Music 2</td>
<td>MCT4031 Applied MCT Project 1</td>
<td>Elective course</td>
</tr>
<tr>
<td>1 A</td>
<td>MCT 4021 Physical-Virtual communication and Music 1</td>
<td>Entrepreneurship</td>
<td>MCT4010 - Research methods, tools and issues</td>
</tr>
</tbody>
</table>

Programme structure

Compulsory courses (70 credits)

- MCT4000 - Introduction to Music, Communication and Technology (15 credits) (including Video recording and editing, and Sound recording and editing)
- ENT4000 - From idea to business (5 credits)
- MCT4010 - Research methods, tools and issues (5 credits)
• MCT4021 - Physical-Virtual communication and Music I (5 credits)
• MCT4022 - Physical-Virtual communication and Music II (5 credits)
• MCT4023 - Physical-Virtual communication and Music III (5 credits)
• MCT4031 - Applied MCT Project I (10 credits)
• MCT4032 - Applied MCT Project II (10 credits)

Elective courses (20 credits)
• MCT4041 - Interactive music systems (5 credits)
• MCT4042 - Motion tracking (5 credits)
• MCT4043 - Spatial audio (5 credits)
• MCT4044 - Sonification and Sound design (5 credits)
• MCT4045 - Music and Machine Learning (5 credits)
• MCT4046 - Audio Programming (5 credits)

You may apply for recognition of 15 ECTS credits taken in other subjects when these can be seen as relevant for the candidate’s Master’s Thesis. If you are going on Exchange, you may get 30 credits/ECTS in external courses approved as part of your degree. Consult the Student Advisor if you wish to do so.

Master’s thesis (30 credits)
• MCT4090 - Master's thesis in Music, Communication and Technology (30 credits)

Learning methods
All learning activities will be shared between the two campuses, and students in both Trondheim and Oslo will collaborate closely. There will be permanent online facilities with high-quality video and audio where students may meet to discuss, present, learn, cooperate and perform. Teamwork across campuses is a key strategy for problem-based learning and external project work. The programme will make extensive use of “flipped classroom”, digital learning tools and video lessons. The learning spaces will be permanent areas for research on tools and strategies for efficient learning and communication.

The MCT programme will also apply a wide range of assessment strategies to ensure optimal coverage of the learning outcomes. Examples are: Team project portfolio, individual portfolio, digital home exams or written exams, oral presentations with peer review (trial lecture), literature reviews, etc.

Entrepreneurship and innovation
The candidates will work on real-world problems, in collaboration with institutions in the public or private sector. The aim is to use the knowledge and experience acquired to find solutions to issues beyond the scope of music technology. The candidates will develop skills in interdisciplinary problem-solving and international teamwork, something that is in high demand amongst employers.

The final master's project will be supervised by one or more of the researchers connected to the programme. Candidates may choose to do their projects in close collaboration with industry or with one of the research groups at UiO or NTNU.

Internationalization
Students of Music, Communication and Technology are encouraged to take a semester abroad during the third semester, or in the summer. Since MCT is a joint master’s programme, the candidates effectively become students both at NTNU and UiO and can apply to exchange programmes at both universities. In addition, both departments have bilateral agreements tailored to students of Musicology and Music Technology.
Professional and occupational prospects

The master's degree in Music, Communication and Technology provides the candidates with theoretical knowledge, technological skills, a critical sense and creative abilities that will make them equipped to take on many different roles in their professional life. Some examples of relevant jobs are:

**Music sector**
- Engineering
- Design
- Interactive concert experiences
- Education
- Research & development
- Entrepreneurship
- Production
- Performance

**Technology industry**
- (Sonic) interaction design
- Multimedia
- Information retrieval
- Gaming
- Sonification / auditory display design
- Teleconferencing
- Network communication and education

**Media sector**
- Audiovisual production
- Multimedia evaluation

**Health sector**
- Interactive music therapy
- Sound/music in sports/exercise
- Interactive sound and music for well-being
- Interactive sound and music for rehabilitation

**Other**
- Sound and interaction design for museums/exhibitions