M O N T A N A   B O A R D   O F   R E G E N T S

LEVEL II REQUEST FORM

Item No.:	134-2010-R0307-Revised	Date of Meeting:	May 31-June 1, 2007
Institution:	Montana State University-Bozeman		
Program Title:	Bachelor Of Arts In Music Technology		

Level II proposals require approval by the Board of Regents.

Level II action requested (check all that apply):   Level II proposals entail substantive additions to, alterations in, or termination of programs, structures, or administrative or academic entities typically characterized by the (a) addition, reassignment, or elimination of personnel, facilities, or courses of instruction; (b) rearrangement of budgets, cost centers, funding sources; and (c) changes which by implication could impact other campuses within the Montana University System and community colleges. Board policy 303.1 indicates the curricular proposals in this category:

☐	1.	Change names of degrees (e.g. from B.A. to B.F.A.)
☐	2.	Implement a new minor or certificate where there is no major or no option in a major;
☒	3.	Establish new degrees and add majors to existing degrees;
☐	4.	Expand/extend approved mission; and
☐	5.	Any other changes in governance and organization as described in Board of Regents' Policy 218, such as formation, elimination or consolidation of a college, division, school, department, institute, bureau, center, station, laboratory, or similar unit.

Specify Request:

Montana State University - Bozeman seeks approval from the Montana Board of Regents to offer a Bachelor of Arts in Music Technology.

The Program would be managed by the Director of Music Technology and the Department Head of the Department of Music. The proposed program includes both specialized Music Technology coursework and interdisciplinary work in conjunction with other University departments.

Professionals in sound and music are called upon to handle a wide range of work, from music composition to sound synthesis to equipment installation and operation. Students are best prepared to direct their own careers when they have educational background in all of these areas. The Music Technology program at MSU - Bozeman meets this need, integrating theory and performance, composition, acoustics, audio engineering, music for visual media, and interdisciplinary studies.

M O N T A N A   B O A R D   O F   R E G E N T S

NEW ACADEMIC PROGRAM PROPOSAL SUMMARY

Item No.: 134-2010-R0307-Revised	Institution: Montana State University-Bozeman

1.   How does this program advance the campus' academic mission and fit priorities?

Mission Statement
  * To provide a challenging and richly diverse learning environment in which the entire university community is fully engaged in supporting student success.
  * To provide an environment that promotes the exploration, discovery, and dissemination of new knowledge.

    The Bachelor of Arts in Music Technology is a comprehensive program with proven appeal to a large and varied student population. This program, if approved, will prepare students for the diverse and ever-changing opportunities in multimedia production, electronic music, audio engineering, and related fields with which music technology shares interdisiplinary connections. The curriculum focuses on interdisciplinary collaboration and multiimedia art, research and critical inquiry, and hands-on creative projects. The academic quality of this program will elevate the Department of Music's national reputation and provide interdisciplinary courses to enhance MSU - Bozeman's Media and Theatre Arts, Art, Architecture, and Engineering degrees. The new program will allow MSU - Bozeman to expand its course offerings into popular music studies and music production for electronic and interdisciplinary media. An established Music Technology program will also contribute to MSU - Bozeman's flagship Music Education degree, giving Music Education graduates more tools for building K-12 music education in Montana. Finally, the Music Technology program will serve the previously untapped market for multimedia and electronic music performance in the Bozeman area, institute community learning opportunities for adults and youth, and support the film, theatre, audio, and music industries and communities of Montana.

2.   How does this program fit the Board of Regents' goals and objectives?

    The Music Technology program will further the Board of Regents' strategic goals:
- A Music Technology degree will dramatically increase enrollment and retention, as it has already attracted a diverse population of students who would not otherwise have sought out the Music Department. Our experience in this first year has revealed a student demand equal to twice the available space.

- This program will help to build and diversify Montana's economic base; graduates in Music Technology will be prepared for graduate study in music, employment in audio, film, and multimedia, and entrepreneurship in their own audio-related ventures (an industry with much potential for expansion in Montana).

- This new program has already begun to improve departmental effectiveness by bringing in new technology resources, by opening new fields of study and new avenues for interdisciplinary collaboration, and by attracting high-achieving students to MSU - Bozeman from across the nation. Similarly, we are already developing interdisciplinary courses that will contribute to MSU - Bozeman's Five-Year Vision of an increasingly interdisciplinary undergraduate curriculum.

3.   How does this program support or advance Montana's needs and interests?

   Music Technology provides expertise to existing Montana firms producing: multimedia, computer applications and games, technical training programs, video, CD and DVD. In addition, the Montana government is working to expand and improve the film industry in Montana, and MSU - Bozeman's Music Technology program will provide students and graduates ready to assist in that effort. The fields of music production, sound design, and recording are primed for growth in Montana as they are elsewhere in the nation. The MSU - Bozeman music education graduates will also gain expertise in technology that can better serve the youth of Montana when their

undergraduate program provides technological tools and guidance in deploying them for classroom use. Similarly, proficiency with music technology is essential for graduate study in music composition. Placement of MSU graduates in prestigious graduate programs will further the academic reputation of MSU - Bozeman and Montana in general.

4. How will this program contribute to economic development in Montana? (Note projected annual economic impact both regionally and statewide.)

   As the tools of music production become increasingly consolidated inside a single computer, multimedia and film producers seek out "one-stop shopping" for music and sound design. Today's music industry offers more and more self-directed career paths and opportunities for composer/engineers who can handle every step in the process of music creation. MSU - Bozeman's Music Technology graduates will be prepared to establish themselves in this effort, thereby increasing small business ownership and entrepreneurship in Montana. As Montana's popularion grows, businesses involving audio and music will grow correspondingly. In particular, representatives from the live sound reinforcement industry report a growing need for qualified employees. Montana businesses have recently made inroads into the pro audio equipment industry as well. Music Technology graduates will be prepared for further study or entry-level work in audio equipment design and research, in music composition, in sound design, or in some combination of all of these. Insofar as this Music Technology program can increase the national perception of Montana as an attractive location for the film and audio industries, it will help to attract larger employers and easily measurable economic development.

5. What is the program's planned capacity?

•	Break-even point?	7 majors plus 21 pre-majors per year
•	Enrollments / year?	12 majors plus 24-36 pre-majors
•	Graduates / year?	12
•	MT jobs / year?	10

6. Resource Allocation:

•	Total program budget?	$ 386,200 (year 5 estimate)
•	Faculty FTE?	1.85
•	Staff FTE?	1.0

7. Does this program require new resources? ⊠ Yes   ☐ No

   If yes, what is the amount? $ 146,159

8. How will the campus fund the program?

   Reallocation of existing funds, external grands and sponsorship

9. If internal reallocation is necessary, name the sources.

   Redistribution within the College of Arts and Architecture and within the Department of Music: Reassignments of existing faculty lines (due to retirement), redistribution of operational dollars currently used for electives, revise faculty teaching assignments, redistribution of resources for new sections of course work.

ITEM 134-2010-R0307

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Proposal for a Bachelor of Arts in Music Technology at
Montana State University – Bozeman

VISION

In the past ten years, the widespread proliferation of devices for recording and manipulation of digital audio has redefined the music industry. Music production-- composing, performing, recording, and mixing-- no longer requires a commercial recording studio. While high-end studios still attract elite clientele, the once-ubiquitous 24-track tape studio has been nearly squeezed out of business by musicians learning to self-produce using only software and affordable, portable hardware. The traditional roles of composer, producer, promoter, and sound engineer mesh and overlap. Today's music industry offers fewer opportunities for specialist engineers and strictly pen-and-paper composers, and more opportunities for composer/recordists who can work in all aspects of sound and music production.

Student demand for university education in music technology is rising rapidly, as the tools of the trade become more affordable and widely available. Nationwide, growing numbers of high school students are discovering an aptitude for creating sound and music with computers. Every year more of these students seek out university degree programs to prepare them for future work in this new and evolving field.

Professionals in sound and music are called upon to handle a wide range of work, from composing music to creating sound effects to designing and operating recording studios and equipment. One common scenario is a "package deal" in which a composer is hired to compose, notate, conduct, and record a film soundtrack. Composition and sound effects are also increasingly linked, as composers and sound designers work together closely, often using similar source materials. The composer, sound designer, and sound board operator may be the same person, particularly in multimedia and theatre performance.

Students are best prepared to direct their own careers when they have educational background in all of these areas. The Music Technology program at MSU – Bozeman meets this need, integrating theory and performance, composition, acoustics, audio engineering, music and sound design for visual media, and interdisciplinary studies. Students will work in creative teams, solve technical and musical problems, explore the history and significance of multimedia art through reading and critical analysis, and find their own paths in the world of artistic communication through sound.

OBJECTIVES AND NEEDS

Degree requirements - Attached is a list of degree requirements with course descriptions for existing and new courses.

Need for the program

Student demand for a Bachelor of Arts in Music Technology is extraordinarily high. As of November 30, 2006, we had 22 prospective majors waiting to hear whether the program will continue into its second year to become a new major. The vast majority of these students are attending MSU –Bozeman specifically to study music technology. The number of prospective students exceeds capacity in the required courses, necessitating a "gate" to admit twelve pre-majors to major status each year.

Of the eleven prospective students who entered the program in Fall 2006, ten have indicated they would definitely leave MSU if Music Technology is not offered as a major. Five students this year took a leap of faith by coming to MSU – Bozeman from out of state for this program, even before the new courses had been added to the course schedule. This fall we turned away sixteen prospective majors due to insufficient room in the introductory class, and the spring Introduction to Digital Music course has a waiting list of twelve. Six of the 22 total prospective majors are currently declared as music majors; the others are in University Studies or hope to switch majors. Of the six declared music majors in this group, only two would have declared as music majors without the Music Technology program.

This Music Technology program will build and enhance the national reputation of MSU – Bozeman's Department of Music, and it will connect the music department to other departments and colleges through interdisciplinary coursework. Our courses will add value to the Media and Theatre Arts program, one of the top film programs in the country, as a significant number of film students have expressed interest in learning the basics of film music composition and furthering their work in sound design. Music technology is also valuable to sound and audio research initiatives within the engineering department, as digital recordings of musical sound are a well-known challenge for engineers working in digital signal processing. (One example would be recent efforts in the engineering field to build a bionic ear that can intelligently discriminate between musical sound and other sound, or between different kinds of musical sounds.) In many universities, acoustical engineering students take music technology courses to gain a musician's perspective on these challenges. Finally, MSU – Bozeman's existing Music Education degree and focus on the Music Education field will be correspondingly strengthened as the Music Technology program grows.

The U.S. Bureau of Labor Statistics anticipates growth in audio production jobs through 2014.[i] While consolidation limits job growth within the largest media conglomerates, smaller companies are flourishing nationwide through a combination of niche marketing and diversification.[ii] The following list of industry growth areas is likely to change every year, as new technologies shift the landscape of the industry:
- composition, production, and marketing of independent music (concert and popular genres alike)
- composition and sound design for film, television programs and commercials, theater, visual art, video games, virtual environments, and consumer devices such as mobile phones
- design, installation, and operation of live sound systems for concerts and other events
- content for new internet and broadcast media
- musical instrument and audio equipment design, manufacture, and sales
- audio software research and programming
- music education at all levels. The connection with music education is increasingly important, as new technology encourages young people to become music creators instead of passive consumers.

Graduates with degrees in Music Technology will be prepared to build their own studios and music-related businesses, increasing entrepreneurship and expanding the music and audio industry in Montana. Continuous improvement in internet-based collaboration tools will allow composers in Montana to work on Hollywood films and other projects with fewer geographical limitations than ever before. In developing this program, MSU faculty have consulted with representatives from the Montana music, pro audio, theatre, and film communities. Montana's growing film industry in particular produces a corresponding need for music and sound design. Similarly, local musicians report a need for new employees and entrepreneurs in the Montana recording industry, as major projects are currently forced out of state to find recording studios that meet their needs. Representatives from the live sound reinforcement industry in Montana also report a need for technicians with musical knowledge and technical skills.

The program we propose, with no equal in Montana or neighboring states, offers unique benefits to MSU – Bozeman:
- Enhancing the university mission to support student success in a world of diverse and constantly-evolving technology
- Attracting top students from across the nation, as do similar programs in other states
- Additional study and future development of a minor for students in MTA and other departments, making those degrees more marketable. Specific courses already in the planning process include Physics of Sound and Interdisciplinary Film and Music Projects. Other potential interdisciplinary courses could involve engineering electronic musical instruments, creation of installation pieces and sound environments for architectural models, CD design and marketing with graphic design students, or digital audio software design and programming with engineering and computer science students.
- The successful Sunday Night Multimedia Series, which has revealed an untapped market for multimedia performance in the Bozeman community
- Potential for equipment sponsorships, technology grants, and audio-related research funding
- Summer music technology camps for youth and adults, as a venue for fundraising, community service and nationwide recruiting.
- Several of the music technology courses we envision, such as Words and Music/Songwriting, Music Business, and History of Film Music, could be developed as Core 2.0 courses and opened to large numbers of non-majors, provided that we have sufficient faculty in Music Technology.

While the music department will require additional infrastructure to support a new degree program, the academic environment for such a program at MSU is ideal. Between MSU – Bozeman's location, a cutting-edge curriculum that adapts to the ever-changing industry, and established connections with MTA and Engineering, a Music Technology degree offers enormous potential to attract high-achieving students. Based on the work already being produced by our prospective Music Technology majors, it is evident that MSU – Bozeman has potential to grow into the major center for music technology in this region of the United States.

ADEQUACY, ACCREDITATION, AND ASSESSMENT ISSUES

Adequacy and Accreditation
Our accrediting body, the National Association of Schools of Music (NASM), will need to ensure that all music majors have access to the required music core classes for a degree in Music Technology.

NASM will review the new program for "Plan Approval" once the new degree program has received institutional approval but before the program admits students. The proposal for Plan Approval will detail the new degree program and assess compliance with NASM standards. NASM has additional standards specifically for programs focusing on electronic media. Based on our examination of similar Music Technology programs nationwide, we anticipate that our proposed curriculum will meet these standards. If time permits, we may also submit the plan for a consultative review prior to Board of Regents approval in order to obtain guidance on any potential areas of concern for NASM. We have spoken directly with Sam Hope, the Executive Director of NASM, and incorporated his suggestions in order to ensure that our curriculum meets national standards for a Bachelor of Arts degree. We plan to submit the new degree for Plan Approval on May 1, 2007, for a decision at the NASM meeting in June of 2007.

Once Plan Approval is achieved and at least three students have completed the program, NASM will review the degree program and confer Final Approval for Listing in their national directory of degree programs.

Assessment
Intermediate assessment of students in the program will be accomplished by the gate, which will follow the first-year Music Theory sequence and the first two Music Technology courses. The Department of Music conducts alumni assessment through our Department Student Assessment and Outcomes Policy, which includes questionnaires and tracking of post-graduate employment data. Program review will be conducted periodically by the Music Department Head and Music Technology Committee.

IMPACT ON FACULTY, FACILITIES, COSTS, STUDENTS, AND OTHER DEPARTMENTS AND CAMPUSES
The Music Technology program will increase the number of music majors by 72-84, which is an increase of nearly 100%. Tuition revenues will grow correspondingly, though the program will require an increase in the Department of Music annual budget to cover faculty and staffing needs. The required music core courses in the Department of Music, the administrative staff, and many of our faculty are functioning under overload conditions this year, even without the 36-48 new music majors and 36 pre-majors that the Music Technology program will bring.

Personnel
Of the schools with Music Technology degrees in the U.S., virtually all comparable or smaller public institutions have at least two faculty positions in music technology and at least three administrative staff positions in the music department. (See, for example: the University of Alabama at Birmingham, Western Carolina University, California State University-Chico, Oregon State University, St. Cloud State University, and Indiana University Southeast.)

Mid-size programs, of the size to which ours could eventually grow, have two or more music technology faculty and 4-12 staff positions in the music school. (These include Virginia Tech, Bowling Green State University, Wayne State University, University of Denver, California State-Northridge, San Jose State University, Georgia State University, and Florida International University.) The largest and most well-

known Music Technology programs at public institutions (such as the University of Michigan, Ball State University, the University of Oregon, the University of Colorado at Boulder, and Northwestern University) have between three and five music technology faculty and 12-30 staff positions in the music school. Private schools with music technology programs are also typically staffed at high levels. Our Music Technology program can become a national contender for top students, provided our staffing starts at the minimum level to support at least 36 majors and 36 pre-gate prospective majors each year.

Costs and revenues associated with the new program are enumerated on the attached spreadsheet. Personnel costs include 30% of salary for University benefits.

Faculty - Theory/Aural Skills/Keyboard Skills
Our Theory I and Keyboard Skills I classes are filled to capacity with music majors, and Aural Skills I currently has only three empty spots. For ideal pedagogical effectiveness, the Theory/Keyboard Skills/Aural Skills sequence should be taken together prior to the gate for all prospective music technology students. For a cost of approximately $22,100, a new half-time adjunct faculty member with a Master of Music degree could teach two additional sections of Aural Skills I and Keyboard Skills I as well as a second section of Theory I.

Faculty - Applied Music (Lessons on principal musical instrument or voice)
We will require each Music Technology student to demonstrate proficiency on a principal instrument or voice. This proficiency requirement is not only essential for program accreditation, it is necessary to prepare students for the variety of opportunities in employment and graduate education. In 2007-2008, approximately 9 to 18 new music technology students will enter Applied Music as guitarists. Our professor of guitar is part-time and can only accommodate four additional students. Several more students will enter with piano as a principal instrument, yet our piano studio has no additional capacity. For a cost of approximately $7,800, we can add .25 FTE of capacity to these studios to accommodate these students.

Faculty - Music Technology
We currently have one tenure-track line available for Music Technology, currently filled by our Director of Music Technology on a full-time adjunct basis. To implement the entire Music Technology program we will need a second faculty line to teach new large core courses and new interdisciplinary courses. This interdisciplinary collaboration is the critical link that will elevate the proposed program above competing programs nationwide. We anticipate that an additional tenure-track line will be available for a second Music Technology professor (doctorate preferred or ABD), and that filling this line would cost approximately $54,600. If necessary, the additional Music Technology classes could also be taught by adjunct faculty with at least a Master of Music degree.

Faculty - "Buyouts" for interdisciplinary courses
The Music Technology program may need to provide funding for faculty from other departments to teach interdisciplinary courses such as Physics of Sound. Adjunct faculty may also be needed to teach the MTA Editing course, allowing MTA Assistant Professor Theo Lipfert to team-teach the new Interdisciplinary Projects course and add a new section of MTA 254 (Sound) to accommodate Music Technology students.

Professional staff
This year the Director of Music Technology position requires overnight shifts several nights per week on department-wide technical support, supervision of recordings, technical coordination of events, and equipment maintenance. These tasks are performed by staff members in other similar music technology programs, just as our MTA program has staff for analogous tasks. With the addition of a professional staff position to the department, the Director of Music Technology will be able to design and implement the new courses planned for the upper-level Music Technology curriculum. This new staff member, hired as a 12-month half-time technical coordinator and recording engineer, would cost approximately $19,500 per year, including benefits. In the fourth year, as the number of music majors approaches 200% of the pre-program number, this staff position would increase to 1.0 FTE for a cost of approximately $39,000.

Student employment
Work-study computer lab monitors costing from $4,022 to $4,826 annually will be needed to increase lab hours as the program grows. One or two student employees will also be needed at $10 per hour for 10 hours per week, for a total cost of $3,017 to $6,033 per year. These student employees, hired as Music

Technology assistants, would enable the Director of Music Technology to continue curriculum development as the program population grows to its steady-state size (with approximately 36 majors and 36 pre-majors).

Equipment

Equipment needs will vary by year. This year we received start-up funding from the Office of the Provost to convert two rooms in Howard Hall into work space for upper-level Music Technology students. Though we currently use some cords and speakers borrowed from the Director of Music Technology's home studio, we anticipate that these and other needed items for 2007-2008 will be obtainable through EFAC, CFAC, and course fees and program fees similar to the fees required in our Media and Theatre Arts program. Funding for equipment may also be secured through grants from outside sources, particularly for community-based initiatives, such as a summer program or a weekend program for high school students. A small number of CDs, documenting the history of music technology and electronic music, will be needed in library holdings for Music Technology classes. (Currently the Director of Music Technology provides CDs from a personal music library for this purpose.)

Sources of Funds

Anticipated revenues from the Music Technology program

- Program fees
- Full-time out-of-state tuition for approximately 4 new majors and 8 new pre-majors per year (assuming 66% in-state students and 33% out-of-state students).
- Tuition for a summer music technology camp and/or weekend community programs (in planning stages)
- Possible technology grants for community-based programs
- Possible research funding for advanced research in digital signal processing and related areas

Student Population

The attached budget figures assume 24 pre-gate prospective majors and 12 students accepted into the major program the first year. If a second faculty position is created in Music Technology, the number of students accepted into the program could grow to a total of 36 majors and 36 pre-majors once the program reaches its steady-state level. Increasing the number of majors beyond this level would require additional faculty, and significant increases beyond this level would require additional facilities.

Student/Faculty Ratio

The student/faculty ratio for the existing Music Technology courses (Introduction to Digital Music 115, MIDI Sequencing and Notation 230 and Recording 221) is 16:1. The majority of upper-level courses in Music Technology will vary from 6:1 to 12:1, with some individual instruction courses (i.e. Composition 406 and applied instrumental lessons) also required.

Recruiting

The Department of Music has an established recruiting system involving contacts with high schools and faculty travel for meetings with prospective students. Recruiting initiatives for Music Technology will focus on four main student categories:

- Students in high school band, orchestra, and choir, both within Montana and out of state, who display an interest in creating music with computers and electronic keyboards.
- Students who study piano, guitar, or another instrument and display an interest in creating music with computers and electronic keyboards.
- Students from all states with high school or community college experience in music technology, multimedia, and music theory programs. Many of the high schools offering Music Technology as a magnet program are located in urban areas and serve under-represented populations.
- Students who have less experience in a high school music education setting, but who display a self-taught ability to create music and multimedia pieces using computer software.

Time to complete degree

Students who pass the gate into the Music Technology degree program can reasonably expect to complete the B.A. in Music Technology in a total of four years. It would be possible to institute agreements for credit transfer from community college in Theory, Keyboard Skills, and Aural Skills.

The Necessity of a Core Music Curriculum

Employment opportunities in music technology are likely to change every year, as new technologies shift the landscape of the industry. Nevertheless, every art form connected to music technology depends upon the skills and principles taught in a core music curriculum. Music theory, aural skills, and keyboard skills give aspiring audio artists the tools to create and manipulate musical lines, progressions, forms, and structures. Those same skills apply to popular music in virtually any genre, concert and electronic music, music and sound design for film and theatre, radio documentaries, DJ sets, and any other form of temporal art with sound. Learning an instrument and playing in an ensemble provide necessary experience in collaboration with other musicians. The audio engineers and technicians who obtain repeat business from musicians are the ones who are fluent in communication about music itself.

Keyboard skills, in particular, are integral to the study of music technology:
- Every music major must reach a certain level in keyboard skills for the degree program to receive accreditation by the National Association of Schools of Music.
- Keyboard skills are part of the music theory curriculum. Scales, intervals, chords, and other building blocks of music cannot be fully mastered without visual/tactile reinforcement at the keyboard.
- Computers are increasingly used as virtual instruments, played by an electronic MIDI keyboard. Virtually every piece of music software now includes virtual instruments, from free entry-level tools, such as Apple's GarageBand, to the most powerful professional music production packages.
- The piano keyboard is the interface to music notation software, much as the computer keyboard is the interface to a word processor. Creating sheet music requires keyboard skills to enter the notes.
- In spotting sessions and other film applications, the composers, orchestrators, and sound editors communicate with the director about musical phrases and timings by playing them at a piano keyboard.
- In the studio, recording engineers and recording artists communicate about song structure and chord changes by demonstrating at the keyboard.
- Certain contemporary genres of music are created using nothing but electronic keyboards, much as early blues music was created entirely at the guitar.
- Keyboard skills are required for entry into graduate programs in music and music technology.

MSU – Bozeman has a strong curriculum in music theory, aural skills, and keyboard skills. With modest expansion this course sequence could accommodate the addition of 24 new prospective majors per year.

Relationship to Other Institutions

Currently there is no other comparable four-year Music Technology program in this region of the United States. The University of Montana offers a Bachelor of Music degree in Composition and Music Technology, structured according to the conservatory model and requiring admittance as a Music Composition major. The music technology component of UM's degree program includes five courses (four of which are required) and focuses on traditional electroacoustic composition, excluding popular music studies.

While most major universities offer classes in electronic music within a degree program in music composition, Oregon and Colorado are the nearest states with specialized Music Technology degree programs comparable to ours. None of the major state universities in Wyoming, Idaho, Utah, or the Dakotas offer four-year degree programs specializing in music technology or electronic music composition. Universities throughout the Northwest report that the number of prospective music technology students they encounter each year exceeds their capacity.

Unique strengths of the Music Technology program at MSU – Bozeman

MSU – Bozeman has a strong existing core music curriculum, as well as strengths specific to music technology:

The traditional music conservatory vs. MSU – Bozeman's interdisciplinary model

The traditional music-conservatory approach to music technology, adopted at many schools including the University of Montana, offers music technology as part of a Bachelor of Music degree in music composition. These are academically rigorous programs, particularly effective as preparation for graduate study in music. The conservatory curriculum, however, has limited room for undergraduate-level collaboration with film and theatre, graphic design, architecture, physics, engineering, and computer science. College graduates with experience in collaboration have an advantage in the increasingly interdisciplinary

field of audiovisual media arts.

Exclusive focus on concert music vs. MSU – Bozeman's inclusion of popular and commercial music
In the conservatory model, popular and commercial styles are often addressed only peripherally in favor of traditional concert music. In today's music industry, however, the rift between art and popular music is closing as new economic realities render it irrelevant. As worldwide marketing and distribution becomes feasible even without a large record company, the music industry is splitting into hundreds of niche markets populated by independent artists of all genres. Our program can help students to find markets for their own music, and to produce music of the highest compositional and technical quality in a variety of concert and popular genres.

Exclusive admittance of classically-trained students vs. MSU – Bozeman's diverse student population
The conservatory model limits the music-major population to students who already have classical training. Since many students begin learning music using software instead of classical instruments, our program provides a path to a degree in music technology for motivated and talented students with little to no classical experience. Students in this category will be allowed more time to complete the degree as they bring their general musicianship skills up to a music-major level. This is essential because classical theory and performance courses teach the language and skills musicians use in their professional work.

Vocational education vs. MSU – Bozeman's broad and comprehensive curriculum
Another common approach to music technology is a vocational model, sometimes advertised as "Sound Recording" or "Commercial Music Production." One problem with the vocational approach is its overly narrow scope. An ideal music technology curriculum covers recording and commercial music, but always as part of a broader study of music theory and history, composition, the science of sound, and interdisciplinary studies. This broader curriculum prepares students for today's real-world environment, where multiple specialties are highly valued, and where recording and engineering are inextricably linked with composition and sound design.

Software training vs. MSU – Bozeman's inquiry-based learning and critical thinking
Another limitation of the trade-school approach is an excessive focus on software training as opposed to critical inquiry. For example, while Digidesign's Pro Tools software is an industry standard, a class that teaches "Pro Tools" does students a disservice when it does not simultaneously introduce students to fundamental acoustics and sound design. Ten years from now, Pro Tools may be so advanced as to be unrecognizable, or it may have been entirely replaced by new technology. It does little good to focus instruction solely on "which button to press" when the buttons change from version to version. By giving students opportunities to learn how software functions (why the buttons are there in the first place), we prepare them for any future software they might encounter.

Our proposed B.A. in Music Technology, not being limited to a particular conservatory or trade-school approach, can overcome the limitations inherent to these competing models. At the same time, our Core 2.0 curriculum gives students a broad liberal-arts education and a solid foundation for intellectual inquiry. This combination is in high demand across the nation.

Opportunities for Graduates
Graduates with a B.A. in Music Technology will be prepared for a wide variety of employment opportunities as well as graduate study in music composition, film music, audio engineering, or interdisciplinary media. Through involvement in academic organizations and conferences, the Director of Music Technology will maintain connections with graduate programs throughout the nation.

In addition to careers specifically related to the Music Technology field, Music Technology graduates will be prepared for further study and/or training in a number of fields such as music equipment sales, advertising and commercial production, studio design, technical support, software programming, and equipment design. According to the U.S. Department of Labor, the following are nationwide median income figures for professions related to music technology. [1]

Median yearly salaries in music and multimedia:
Music directors and composers $34,570
Radio and television producers $43,890

Multimedia artists/animators $94,000

Median salaries in audio fields:
Sound engineering technicians $38,110
Sales engineers $70,620

Median salaries in broadcasting:
Audio and video equipment technicians $32,570
Broadcast technicians $28,010

Median hourly earnings in the Motion Picture and Video industries:
Entertainers and performers $17.44
Audio and video equipment technicians $16.19

Median hourly earnings for related professions outside the Motion Picture and Video industries:
Musicians and singers $17.85
Music equipment repairers $13.47
Private music instructors $14.85 to $28.85
Radio producers and directors $25.40
Disc jockeys $10.64
Home entertainment equipment installers and repairers $13.44

For selected students who go on to complete doctoral programs in electronic music, music composition, or interdisciplinary multimedia studies - median salary:
Post-secondary teaching $51,800

For students who complete further education in music and audio software engineering - median hourly earnings:
Computer software application engineers $38.43
Computer programmers $35.13
Computer support specialists $21.58

PROCESS LEADING TO SUBMISSION OF PROPOSAL

The initial draft curriculum was designed by music faculty members Johan Jonsson, Ilse-Mari Lee, and Jerry Makeever, film professor Theo Lipfert, Engineering professor Rob Maher (all MSU-Bozeman faculty), and Matt Ridgeway of Ridgeway Sound, in consultation with Russell Pinkston of the University of Texas. Kristi McGarity, Director of Music Technology, worked in conjunction with Johan Jonsson to continue curriculum development and write course descriptions for new courses. McGarity has also founded the Sunday Night Multimedia Series, a performance showcase for collaborative multimedia, multi-speaker sound diffusion, and electronic music and multimedia works by MSU – Bozeman Music Technology students.

We have conducted preliminary discussions with regard to internship and Montana employment opportunities for graduates of the Music Technology program, and will continue with that process.

As of Spring 2007, Music Technology courses already developed and/or established are as follows:
- Kristi McGarity has developed and established three of the courses in the Music Technology program: Introduction to Digital Music, Recording I, and MIDI Sequencing and Notation.
- Two new interdisciplinary courses have reached the preliminary stages in course development: Interdisciplinary Projects MTA, to be team-taught with Theo Lipfert of the MTA department, and Physics of Sound, to be developed in conjunction with the College of Engineering.
- Ilse-Mari Lee has developed and established a Film Music course for upper-level music majors, including the Music Technology majors.
- Kristi McGarity, Ilse-Mari Lee, and Jerry Makeever have jointly developed and established a music technology course for music education majors, outside of the Music Technology degree sequence (MUS 220, Introduction to Computer Applications for Music Education Majors).

CONCLUSION

In the first year, this new program has brought nearly two dozen new students to the Department of Music. Some of these students show exceptional promise in the field, but nearly all may leave if the department cannot ensure the survival of the program. The curriculum outlined on the following pages assumes that 12 students per year will be admitted to the upper level. With a larger annual operating budget we could increase that number. We are committed to the work that must be done to bring this new degree to fruition, for the students we already have and the students we will meet in the future.

Department of Music, Montana State University - Overview of B.A. in Music Technology

Curriculum design by: Johan Jonsson, Kristi McGarity, Ilse-Mari Lee, Jerry Makeever, Theo Lipfert, Rob Maher, and Matt Ridgeway

Note on pre-gate coursework:
Admission to the Music Technology major will be based on a rubric consisting of portfolio review, grades in pre-gate coursework, and service credits for participation and volunteerism.

Courses to develop for possible Core 2.0 designation:
Words and Music (Songwriting), Music Business, History of Film Music

Ideal sequence for Music Technology majors
Freshman Year - Fall

Aural Skills I	103	1	
Theory I	105	3	
Keyboard Skills I	150	1	
Applied Music or	160	1	* Applied Music 160,
Ensemble	xxx	1	2 semesters of ensemble, and
University Core	xxx	3	Music 260 required for graduation.
University Core	xxx	3	
Introduction to Digital Music	MUS 115	3	
Total		15	

Freshman Year - Spring

Aural Skills II	104	1	
Theory II	106	3	
Keyboard Skills II	151	1	
Applied Music or	160	1	
Ensemble	xxx	1	
University Core	xxx	3	
University Core	xxx	3	
MIDI Sequencing and Notation	MUS 230	3	
Total		15	

Sophomore Year - Fall

Electives	xxx	6	
Applied Music or	160 or 260	1	
Ensemble	xxx	1	
University Core	xxx	3	
Recording I	MUS 221	3	
Interdisciplinary Film and Music Projects	MUS 347	3	*At least 1 Interdisciplinary
or Physics of Sound	PHYS 2xx	2	Projects and 1 Physics of Sound
Total		16-17	required for graduation.

Sophomore Year - Spring

Electives	xxx	6	
Applied Music	260	1	
Ensemble	xxx	1	
University Core	xxx	3	
MTA Sound	MTA 254	3	
Composition or	406	2	*At least 1 Composition and
Film Scoring	349	3	1 Film Scoring required for
Total		16-17	graduation.

Junior Year - Fall

(Music History I	310	3)
University Core	xxx	3
World Music	312	3
Sound Design and Synthesis	MUS 341	3
Interdisciplinary Film and Music Projects	MUS 347	3
or Physics of Sound	PHYS 2xx	2
Total		11-14

* Either Music History I or Music History II required for graduation.

Junior Year - Spring

Univ Core	xxx	3
Elective	xxx	3
(Music History II	311	3)
Orchestration	305	2
Interdisciplinary Projects 2	MUS 348 or CAA 490R	3
Composition or	406	2
Film Scoring	349	3
Total		13-17

Senior Year - Fall

Electives	xxx	9
Computer Science or Business elect.	xxx	3
Internship or	MUS 472	3
Upper-division elective	xxx	3
Total		15

Possible Music Technology courses that could also be developed as Core courses with an additional faculty line:
Words and Music/Songwriting
History of Film Music
The Music Business

Senior Year - Spring

Elective	xxx	3
Internship or	MUS 472	3
Upper-division elective	xxx	3
Upper-division elective	xxx	3
20th Century Music	321	3
Senior Project	MUS 405R	3
Total		15

Total credits: 120
Total required music credits: 52
Percentage: 43.33%

Course descriptions for new courses in the Music Technology curriculum

MUS 115 - Introduction to Digital Music
Music Technology faculty
Prerequisites: None; the ability to read music is recommended.
First course in the Music Technology Sequence. Covers concepts and terms, creative projects using software and hardware, an introduction to the music industry, and tools for building self-directed careers within the changing field of music technology. Introduces the history and critical theory of electronic music and multimedia through listening, reading, and presentations.

MUS 221 - Recording I
Music Technology faculty
Prerequisite: Admission into Music Technology program
Introduction to, and exploration of, technologies and concepts used to create, record, edit, format, manufacture, reinforce and reproduce audio. Combination of lecture and hands-on learning.

MUS 230 - MIDI Sequencing and Notation
Music Technology faculty
Prerequisite: Introduction to Digital Music or permission of instructor
Continuation of the MIDI component of Introduction to Digital Music. Composition and music notation, synthesizer programming, constructing an integrated music technology studio, and advanced applications for film and theatre. Students combine creative projects with critical analysis evaluating historical and current relationships between electronic sound and live performance.

[MUS 347 - Interdisciplinary Film and Music Projects]
Team-taught by Music Technology faculty and MTA Film faculty
Prerequisite: Admission into Music Technology program
For upper-level film students and upper-level Music Technology students. Examination of techniques in multimedia art, beginning with an introduction to filmmaking for music students and an introduction to music composition for film students. Students will complete individual projects with visuals and sound, group projects with designated collaborative roles, and a final project using student-designed collaborative strategies. Students will explore an overview of the history of avant-garde music, audio art, video art, and experimental film through readings,   lectures, and presentations.

[MUS 348 - Interdisciplinary Projects 2]
To be team-taught by Music Technology faculty and "bought-out" faculty in other departments
Prerequisite: Admission into Music Technology program
Topics vary by semester in this interdisciplinary course connecting Music Technology with other departments. Possible projects include CD production and marketing with Graphic Design students, installation pieces with Architecture students, instrument building with Mechanical Engineering students, or sound design and composition for large Theatre productions.

[xxx - Physics of Sound]
To be taught by "bought-out" Engineering or Physics faculty or new Music Technology faculty
Prerequisite: None
Enables students not in the Physics and Engineering programs to learn the principles of acoustics, speech, music, and audio. Covers acoustic principles of musical instruments, sound reflection and absorption behavior in rooms, characteristics of human hearing, and basic audio electronics.

[MUS 341 - Sound Synthesis and Design]
Music Technology faculty
Prerequisite: Admission into Music Technology program
Students will explore artistic and scientific applications of recent research in sound, including software for emulation and physical modeling, analysis-resynthesis, noise reduction, cross-synthesis, speech synthesis, and acoustical analysis. Mutually beneficial links between acoustical engineering, computer science, sound design for music composition, and multimedia post-production are emphasized.

[MUS 305 - Orchestration]
To be taught by music department faculty or new Music Technology faculty
Prerequisite: MUS 205 or permission of instructor
Continuation of MUS 303 (Instrumentation), focusing on analysis of orchestral literature and contemporary film scores. Exercises and projects cover idiomatic uses and specific problems for each instrumental section, acoustical properties of the orchestra, and notation for instrumental parts.

[MUS 231 - History of Film Music]
To be taught by music department faculty, possibly in conjunction with MTA Film faculty
Prerequisite: None
A survey of techniques, aesthetics, and trends in film music, from the early days of silent film and live accompaniment to the contemporary film industry.

MUS 349 - Film Scoring
Music department faculty
Prerequisite: MUS 205 or permission of instructor
The course objective is to provide the student with knowledge and guidance through the various stages of the process of creating original music to accompany a visual medium. While no previous film scoring experience is required, a fundamental background in music theory, keyboard skills, and music technology is preferred.

[MUS 322 - Recording 2]
To be taught by new Music Technology faculty (possibly in conjunction with a local studio)
Prerequisite: Admission into Music Technology program and MUS 221
Continuation of Recording I, taught in partnership with a local recording studio. Students work with studio personnel to set up full recording sessions and gain experience with mixing and mastering techniques.

[MUS 321 - 20th-Century Music]
To be taught by music department faculty or new Music Technology faculty
Prerequisite: MUS 311 or permission of instructor
Advanced integrated study of the theory and history of 20th-century musical styles. Analysis and historical context, with an introduction to jazz/pop history and notation.

[MUS 472 - Internship in Music Technology]
To be taught by Music Technology faculty
Prerequisite: Senior standing in Music Technology program
Topics vary by semester. Students work with private companies in setting up sound systems for concerts and other events, sound design for web development, concert recording for public schools, or other organized internships.

[MUS 405R-02 - Capstone Project in Music Technology]
To be taught by Music Technology faculty
Prerequisite: Senior standing in Music Technology program
Each senior Music Technology major composes and produces a large-scale work incorporating original sound design: a film score, an audiovisual multimedia work, an EP-length album of songs, an interactive installation, a theatrical soundtrack, or a large multichannel electronic piece with live instrumental performance. Senior projects will be publicly performed (at a film screening, at a self-produced show, or on the Multimedia Series.)

[MUS 232 - Words and Music/Songwriting]
To be taught by new or existing Music Technology faculty (possible summer course)
Prerequisite: None
For music majors and non-majors. Analysis of the relationship between English words and music from literary and technical perspectives. Students learn poetic analysis, principles of melodic structure, song forms, and techniques for effective text setting. The class will analyze historical and contemporary songs along with musical theater and opera excerpts. Students will work collaboratively on setting original texts to original melodies.

[MUS 233 - The Music Business]
To be taught by new Music Technology faculty (possible summer course)
Prerequisite: None
For music majors and non-majors. An introduction to historical and recent practices in the music business and the practice of entertainment law. Clarifies common myths and misconceptions about major-label record deals, radio play, publicity and promotion, royalties, and copyright. Students will analyze sources of income, interpret recording and publishing contracts, research landmark cases, and work together to design an internet-based music marketing and merchandising plan.

[i] Bureau of Labor Statistics, U.S. Department of Labor, *Career Guide to Industries, 2006-07 Edition*, Arts, Entertainment, and Recreation, on the Internet at http://www.bls.gov/oco/cg/cgs031.htm (visited November 30, 2006).
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Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2006-07 Edition*, Electronic Home Entertainment Equipment Installers and Repairers, on the Internet at http://www.bls.gov/oco/ocos187.htm (visited November 30, 2006)
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Bureau of Labor Statistics, U.S. Department of Labor, *Career Guide to Industries, 2006-07 Edition*, Software Publishers, on the Internet at http://www.bls.gov/oco/cg/cgs051.htm (visited November 30, 2006)

[ii] Weiss, David. "Studio Survival." *Mix* 30, no. 5 (May 2006): 40-44.

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BUDGET ANALYSIS

Proposed Program: Bachelor of Arts in Music Technology
Campus: Montana State University--Bozeman

Note: As of Fall 2006, for the first group of 11 "Year 0" pre-majors, 36% are out-of-state; 91% are here specifically for this program. The following figures assume 33% out-of-state students and 75% here specifically for this program (new revenues).

	Year 1		Year 2		Year 3		Year 4		Year 5	
Estimated **Enrollment**										
FTE Enrollment	36		60		72		84		72	
Estimated Incremental **Revenue***										
Use of Current General Operating Funds	0		0		0		0		0	
State Funds	0		0		0		0		0	
State Funding for Enrollment Growth	0		0		0		0		0	
Tuition Revenue [1]	0		0		0		0		0	
A. Gross Incremental Tuition Revenue	189,200		315,333		378,400		441,467		378,400	
B. Reductions to Incremental Tuition	0		0		0		0		0	
C. Net Applied Tuition Revenue (A-B) →	0		0		0		0		0	
Program Fees	4,200		6,000		7,800		9,600		7,800	
External Funds										
Other Funds										
TOTAL Estimated Revenue	193,400		321,333		455,104		531,455		386,200	
Estimated Incremental **Expenditures**										
	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost	FTE	Cost
Personal Services Faculty Student Professional	.85 .5	33,900 19,500 10,055	1.85 .5	88,500 19,500 10,055	1.85 .5	88,500 19,500 10,859	1.85 1.0	88,500 39,000 10,859	1.85 1.0	88,500 13,000 10,859
Operating Expenses	4,200		6,000		7,800		9,600		7,800	
Equipment										
Start-up Expenditures										
TOTAL Estimated Expenditures	67,655		124,055		126,659		147,959		146,159	
Estimated Revenues Over/Under (-) Expenditures	+125,745		+197,278		+328,445		+383,496		+240,041	

[1] In-state yield rate = $4,276; Out-of-state yield rate = $12,553