# Request for a New Graduate Certificate Program Indiana University School of Informatics IUPUI

#### Media Arts and Science

To be offered as a Indiana University Certificate at IUPUI Proposed beginning date: Fall 2008

#### **INTRODUCTION**

The Media Arts and Science Program was founded in the late 1990s, in a period of growth around digital media technologies that resulted in the establishment of new media centers at universities and colleges throughout the U.S. (See Appendix E) In recent years, interest in Media Arts and Science (MAS) has grown enormously in both industry and academia, with foci in media and design as central issues in information technology, media production, and digital communication. The existing masters program in MAS at IUPUI helps students to develop specialized skills and knowledge in new media. (See the MAS master's curriculum at Appendix C.)

The program prepares students for either applied research or professional best practice in Web and multimedia design, computer graphics and database programming, and animation. Students also develop digital graphics assessment techniques, as well as writing and editing of materials for multimedia. New media career options/titles include: 2D/3D artist, animator, creative technologist, multimedia producer, director of software development, electronic publisher, hypermedia specialist, Internet developer, graphic artist, interactive trainer, music producer, multimedia developer, composer, techno-artist, video/audio editor, webmaster, and web site designer.

The MAS graduate program includes required courses in new media with specific emphasis of philosophy and principles of the field as well as techniques on using technology in communication and cybernetic/human interaction theory. Graduates are prepared to conduct research in the development and effects of using communication technology in academic, social, and vocational settings.

Within the School of Informatics, the MAS graduate program forms bridges between information science and the applied media arts, human-computer interaction, communication, music, social science, and other science domains, such as medicine, health, biology, or chemistry. Although the graduate program is oriented toward professional practice, it is especially focused on applied research.

To-date, the primary professional organization that most faculty and students have found their affiliation has been SIGGRAPH<sup>1</sup>. SIGRAPH (Special Interest Group for Computer Graphics), is a part of the Association for Computing Machinery<sup>2</sup>.

#### JOB MARKET DEMANDS FOR NEW MEDIA PROFESSIONALS

Increasingly, the IT and media fields are demanding professionals trained with skills that are augmented by an understanding of media arts and science principles and practices. Students with acquire a BS or MS in MAS are able to fill the current job market demands. Students acquiring a Certificate in MAS will also position themselves to enter the job new media job market, depending upon how the leverage pre-existing skill-sets in conjunction with those newly obtained knowledge and skills from the MAS Certificate program.

In addition to the demand for new media professionals in the greater U.S., software, Web development, and communication technology companies in Indiana and the surrounding Midwest states are in search of individuals who are qualified with relevant skill-sets, both creative problem-solving and technical. This has been substantiated in two ways.

• First, to show the level of demand in the job market we did a simple online search at the IT Recruiting Web site Dice.com on October 17, 2007. Using the phase "new media," we received a list

of 2865 positions in the U.S. These jobs are all directly or indirectly related to new media, computer graphics, or multimedia. Doing the same search for only Indiana, Ohio, and Illinois listed 230 new media related positions. It is also important to note that this search was done to only include the last 30 days of job submissions. So, these are new posted jobs. Job titles from this search include: Web Developer, Web production Artist, Interactive Web Designer, Web Application Developer, Sr. Web Interactive Developer, Interactive Art Director, Web Interface Designer, Digital Media Technical Architect, Business Strategy – Media and Entertainment.

Second, interviews and group discussions with many new media professionals, and especially the
MAS Advisory Board (primarily from Indianapolis), further substantiate the great need for a new
media certificate program. Find enclosed letters that speak to their support for the program.
In summary, the Graduate Certificate Program in MAS is an educational experience that will
provide students with advanced training in a range of applied theory and techniques in a short period of time.
The program, however, will not require a thesis component.

#### RELATION TO EXISTING CERTIFICATE PROGRAMS

The MAS Graduate certificate program will not compete with any other programs at IU. At the same time, the postgraduate certificate program in MAS will leverage the strengths of the MAS masters degree program already established in the School of Informatics on the IUPUI campus. The MAS program is unique only to the IUPUI campus, i.e., it does not exist at IU Bloomington or any of the other IU campuses.

#### THE TARGET AUDIENCE

This professional, industry-oriented postgraduate certificate program is primarily designed for students with undergraduate degrees in media arts and science, new media or multimedia, computer graphics technology, art and design, computer science, engineering, and instructional and educational technology.

Thus far, most students in the existing MAS Graduate Program at IUPUI hold full time jobs in related fields and are primarily practitioners with the necessary skill-sets to enter the program without remediation. However, students entering the program without the necessary foundations in new media skill-sets are provided remediation with a newly created I590 course (Media Arts Fundamentals), which is provided as a 12-week summer evening course. Based on our statistical assessment, approximately 50% of our MAS students will need some form of remediation, which we have decided to provide during the summer. The other small group of students are international, who usually come to IUPUI to enroll as full time students. These students, in most cases are in no need of remediation.

Hence, the certificate program will initially be for those who work full time. At the same time, as we develop our online MAS program, students locally and from around the world may be eligible to enroll in the program. At this time, our long-term goal is to provide all 15 credits of the certificate program both online and in the class room to meet the need of a diverse group of interested students.

Graduates from the certificate program will choose to either enhance their current skill-set with the five courses or may choose to continue their learning in the MAS Master's Program. In either case, certificate seeking students will receive knowledge and skills that are very hands-on and applicable to their particular new media work.

#### PLAN FOR SUSTAINING STEADY-STATE ENROLLMENT

In the first year (Fall 2008), ten to fifteen students will likely participate in the program. It is anticipated that this number will rise rapidly to fifteen or twenty per year in the next two to three years, as the awareness of the program increases. The potential exists for much greater growth beyond this subsequently.

#### **NEW RESOURCES**

No new resources are needed. All courses are currently taught at IUPUI by existing faculty. However, additional full time and adjunct faculty may need to be hired if the program grows beyond our current capacity.

#### PROPOSED DATE OF THE INITIATION OF THE CERTIFICATE PROGRAM

Proposed date of implementation is Fall 2008, assuming all necessary approvals have been met.

#### PROGRAM ADMINISTRATION & EXECUTION

A committee comprised of Drs. Faiola and Palakal will jointly oversee the program. The Office of the Assistant Dean, Mark McCreary, the School of Informatics, IUPUI, will take responsibility for advising, record keeping, and tracking of student progress. All specific advising and mentoring will be done by those program faculty members listed below

#### PROGRAM ADMINISTRATORS AND THEIR CREDENTIALS

#### Dr. Anthony Faiola, Associate Professor

Director of Media Information and Human-Computer Interaction Programs

Ph.D., Purdue University, 2005 Email: afaiola@iupui.edu Work: 317-278-4141

Bios: With the dual role of faculty and administrator of the Media Informatics and HCI programs, Dr. Faiola's pedagogical research focuses on the theory and practice of media arts and science, HCI, human-centered product design and usability engineering. His empirical research focuses on how culture shapes cognitive development and processes that impact cross-cultural cognition on Web design and Web use. Dr. Faiola is currently working on a range of medical related devices and web portals to assist health practitioners support patient care. His 25 years of experience in higher education, industry, and administration has placed him in an array of roles and environments, both in the U.S. and abroad. Finally, Dr. Faiola has over 50 publications in the field of communication, design, and HCI/usability and is also a three-time Fulbright Scholar to Russia in communication technology.

#### **Dr. Mathew Palakal, Professor**

Associate Dean for Graduate Studies

Ph.D., Concordia University, 1987 Email: mpalakal@cs.iupui.edu

Work: 317-278-7689

Bios: The development of Artificial Neural Network (ANN) models as learning and decision-making systems for various AI-related problems are of primary interest. He is involved in projects that include information management, bioinformatics, and intelligent systems.

#### PROGRAM FACULTY AND THEIR CREDENTIALS

Dr. Shaowen Bardzell, Assistant Professor

Ph.D. Indiana University, Bloomington, IN (2004)

Email: selu@indiana.edu Work: 317-278-7668

Bios: Shaowen Bardzell's research centers on cultural computing, which fuses critical theory and human-computer interaction (HCI) and computer-supported cooperative work (CSCW) approaches to understanding the relationships among computing and emotional, intimate, and/or embodied experiences. The primary domain in which she practices this work is computer-mediated social spaces such as video games, massively multiplayer virtual worlds, and other participant-created environments. Her recent work

has focused on affective interactions in Internet search behaviors, the relationship between technologies of work and play, as well as the work of virtual communities in developing and maintaining complex virtual subcultures. Research Interests:

Experience Design, Affective Interactions, Critical HCI, Human-Computer Interaction (HCI), Computer-Supported Cooperative Work (CSCW, especially its application in video games), and virtual worlds for serious use.

#### Dr. Joseph Defazio, Assistant Professor

Ph.D. Indiana University (2007) Email: jdefazio@cs.iupui.edu

Work: 317-278-4148

Bios: Joseph Defazio has been involved in project development and management within the School of Informatics, Media Informatics. His focus is multi-faceted in that it encompasses graphics, animation, sound, video, 3D environments, authoring, programming toward interactive simulation and game applications. His project development efforts have been primarily Media Informatics students; both graduate and undergraduate. Together they have worked on informative, instructional, entertaining, and simulation productions. My research includes several areas: multimedia design and production, music/audio technology, and knowledge information management. In multimedia design and production, my interest lies in the reorganization, restructuring, and efficient delivery of multimedia productions. I have participated in several projects that lend themselves toward the efficient delivery of graphic/audio/video/animation delivery in a media environment.

#### Dr. Richard Edwards, Assistant Professor

Ph.D. Critical Studies, University of Southern California, School of Cinema-Television (2002)

Email: edwards9@cs.iupui.edu

Work: 317-278-9638

Bios: From 2002-2004, he was a Postdoctoral Fellow at USC's Annenberg Center for Communication's Institute for Multimedia Literacy. He has taught at USC, Loyola Marymount and Saint Mary's College of California. He has published numerous articles in journals such as Film International, Spectator, and RES magazine. He has participated in the New Media Consortium's 21st Century Literacy Project where he contributed to the monograph, "A Global Imperative: The Report of the 21st Century Literacy Summit." Currently, he produces a widely circulating academic podcast, with Shannon Clute, entitled "Out of the Past: Investigating Film Noir."

#### Dr. Edgar Huang, Associate Professor

Ph.D., Mass Communication, Indiana University, Bloomington, Indiana (1999)

Email: ehuang@cs.iupui.edu

Work: 317-278-4108

Bios: His articles about media convergence, online journalism, documentary photography, postmodern photography, digital imaging, and the Internet and national development are seen in Convergence, Journalism and Communication Monographs, Visual Communication Quarterly, Information Technology for Development, etc. Research Interests

- Video/Audio streaming
- Impact of media convergence on media professionals, audience and college education
- Usability and aesthetics of Web design
- Digital imaging manipulation and its impact on audience
- The Internet and national development

#### ADMISSIONS REQUIREMENTS AND PROCEDURES

#### General Admission Requirements for the MAS Graduate Certificate:

Admission requirements and procedures are the same as those established for the Media Arts and Science Program Master's Degree in the School of Informatics. Applicants may apply in both the fall and spring. Specifically, students will be required to submit an application through the graduate school and receive a full review by the Informatics Graduate Admissions Committee. MAS certificate applicants will also be required to submit a new media portfolio by a specified date, just as masters candidates.

The candidate review process will take place for both master's and certificate seeking applicants simultaneously. Moreover, certificate seeking applicants will need to submit the same documentation and meet the same criteria as master's seeking students, e.g., undergraduate GPA scores, references letters, and portfolio. GREs are not required for either. Key differences are that certificate students will NOT be required to complete an additional 15 credit hours of course work, as well as complete a thesis or project.

For further information, refer to the MAS Web site, http://informatics.iupui.edu/academics/media/ (See Appendix D) Students admitted directly to the MAS graduate program may earn this certificate in conjunction with their M.S. degree provided that all the requirements of the certificate program are satisfied.

**Completion requirements:** (See all course descriptions on Page 7.)

General Course Requirements: 15 graduate credit hours are required, including:

- Three core courses (9 credits)
- Two specialization courses (6 credits)

**Total 15 credits** 

**Specific Requirements** 

#### Core (9 credits)

- N500 Foundations of Media Arts Production
- N501 Principles of Multimedia Technology
- I541 Human-Computer Interaction Design I (HCI 1)

#### **Specialization** (6 credits)

- Specialization course 1
- Specialization course 2

#### **Specialization** (Select two courses from this group)

N503 Multimedia Design Applications
 N510 Web Database Concepts (P: N503)

• N502 Digital Media Motion and Simulation Methods (P: M370)

• CSCI 507 Object-Oriented Design and Programming

• CSCI 550 Computer Graphics

• I543 Usability and Evaluative Methods in Interactive Design

#### MINIMUM OVERALL GPA

Successful completion of the MAS certificate requires at least a B average over all courses counting towards the certificate. Courses with a grade of C- or less must be taken again to count towards the certificate. The minimum grade that will be accepted in any single course is C.

#### MAXIMUM NUMBER OF CREDITS THAT CAN BE TRANSFERRED

Applicants who have already earned credit for one or more of the equivalent courses from other institutions and other certificate programs may request to apply up to a maximum of three credits of these courses toward this certificate. Any waivers or substitutions must to be approved by the committee that oversees the program.

#### NUMBER OF UNDERGRADUATE COURSES THAT CAN BE APPLIED

No undergraduate courses can be applied to this certificate program. If students take undergraduate courses for remediation, they cannot be applied toward the MAS certificate program.

#### MAXIMUM TIME FOR COMPLETION

All requirements for the certificate must be completed within three years. Most students enrolled in this program will be part-time students, employed full time. Thus two years may be needed for the completion of all courses if students take one course per semester.

#### CREDIT HOURS TAKEN PRIOR TO ADMISSION

Up to 6 equivalent credit hours taken prior to admission to the certificate program, including 3 hours taken from another institution, will be counted towards the certificate. The rest of the courses must be completed at IUPUI within a three-year period from the time of admission.

#### PROCEDURES FOR PROGRAM EVALUATION / CRITERIA FOR SUCCESS

Upon completion of the MAS certificate program, exit interviews will be conducted for all students to determine the effectiveness of the program in meeting their needs and to identify how they are using the skills and tools learned in the program in their professions. Follow-up interviews will be conducted after three and five years. Given the projected enrollment of this program, and the fact that many of the graduates will remain employed locally, it is anticipated that most students will be tracked this way. Success of the program will be defined in terms of demand (enrollment) and the responses of the students surveyed upon completion of their degree and in the follow-up interviews.

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#### Notes

- 1 ACM SIGGRAPH, the ACM's Special Interest Group on Computer Graphics and related Interactive media, brings together people working on the new media design. ACM SIGGRAPH provides an international, interdisciplinary forum for the exchange of ideas about the field of media arts and science. The ACM SIGGRAPH mission is as follows:
  - **ACM SIGGRAPH's Mission**: Our mission is to promote the generation and dissemination of information on computer graphics and interactive techniques.
  - **ACM SIGGRAPH's Purpose**: Our purpose is to foster a membership community whose core values help them to catalyze the innovation and application of computer graphics and interactive techniques. See <a href="http://www.siggraph.org/">http://www.siggraph.org/</a> and Appendix B.
- 2 ACM delivers resources that advance computing as a science and a profession. ACM provides the computing field's premier Digital Library and serves its members and the computing profession with leading-edge publications, conferences, and career resources. See <a href="http://www.acm.org/">http://www.acm.org/</a> and Appendix A.

#### COURSE DESCRIPTIONS FOR THE PROGRAM

#### I541 Human Computer Interaction Design I

(3 Credits)

This course covers human-computer interaction theory and application from an integrated-approach of knowledge domains, i.e., the cognitive, behavioral, and social aspects of users and user context, relevant to the design and usability testing of interactive systems.

#### N500 Principles of Multimedia Technology

(3 credits)

This course examines issues related to digital media communication in the context of e-commerce and the information industry especially its impact on the cultural, economic, social, and ethical dimensions of local markets and global communities. Topics also include: usability, intellectual property and a diversity of users for new media products.

#### **N501** Foundations of Digital Arts Production

(3 credits)

This course examines the production process and management of digital multimedia. Students investigate and produce projects by researching foundations in the use of digital video with special emphasis on production process of storytelling. Skills learned will include: project development and video production. Students will develop presentation skills through research papers.

#### N502 Digital Media Motion and Simulation Methods

(3 credits)

Applications in animation/simulation design and creation using computer desktop tools. Examines the fundamentals of three-dimensional animation through storyboards and planning, modeling, texturing, lighting, rendering and composite techniques. Topics will include nurbs design development, texture mapping for realism and stylistic output, keyframe and path animation, and cinematography lighting techniques. Skills will be developed through design and modeling of individual or team multi-disciplinary projects.

#### N503 Digital Media Application Design Processes

(3 credits)

Presents the principles and fundamentals of design techniques using authoring tools on PC, Macintosh and emerging computer platforms. Included are storyboarding, planning and organization of scripts, use of current technology, computers, video and digital arts equipment; computer-assisted design and project planner software tools and management of design team concepts.

#### N510 Web-Database Concepts

(3 credits)

Addresses diverse issues arising when designing World Wide Web interface. Basic database concepts will be presented but the course will focus on discussion of interface issues specific to web databases, technologies for linking databases to web servers for delivery, discussion of various web-database applications, case studies, and industry trends.

#### **Usability and Evaluative Methods in Interactive Design**

(3 Credits)

Web usability principles (theory) and practices are covered with a semester long project that draws upon relationships between Web interface design and usability engineering. Students learn a collection of requirements process and testing techniques.

#### **CSCI 507 Object-Oriented Design and Programming**

(3 Credits)

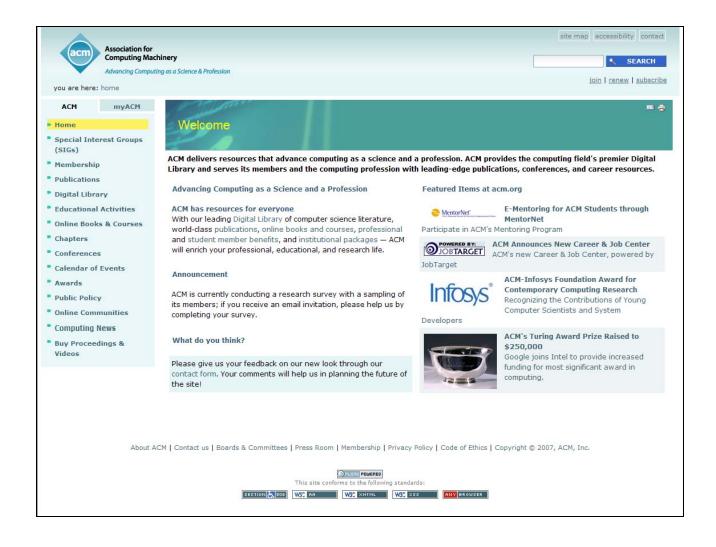
An advanced exploration of the object-oriented model and programming. Topics range from a review of the object model to advanced concepts such as abstraction mechanisms, standard library/packages, OO design using an OO language, and the syntax and the semantics of constructs.

#### **CSCI 550 Computer Graphics**

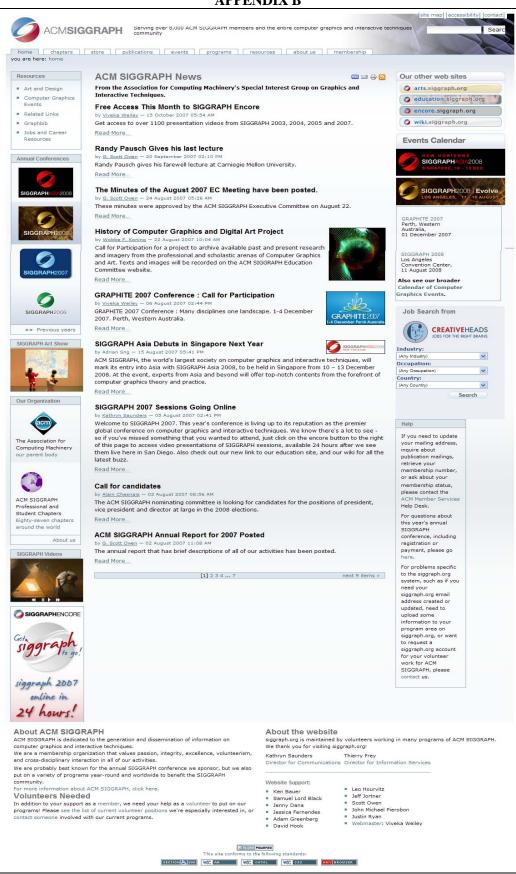
(3 Credits)

An introduction to computer graphics. Topics include the concepts, principles, algorithms, and programming techniques in 3D interactive computer graphics. Emphasis is on the development and applications of 3D graphic algorithms and methods.

#### APPENDIX A



#### APPENDIX B



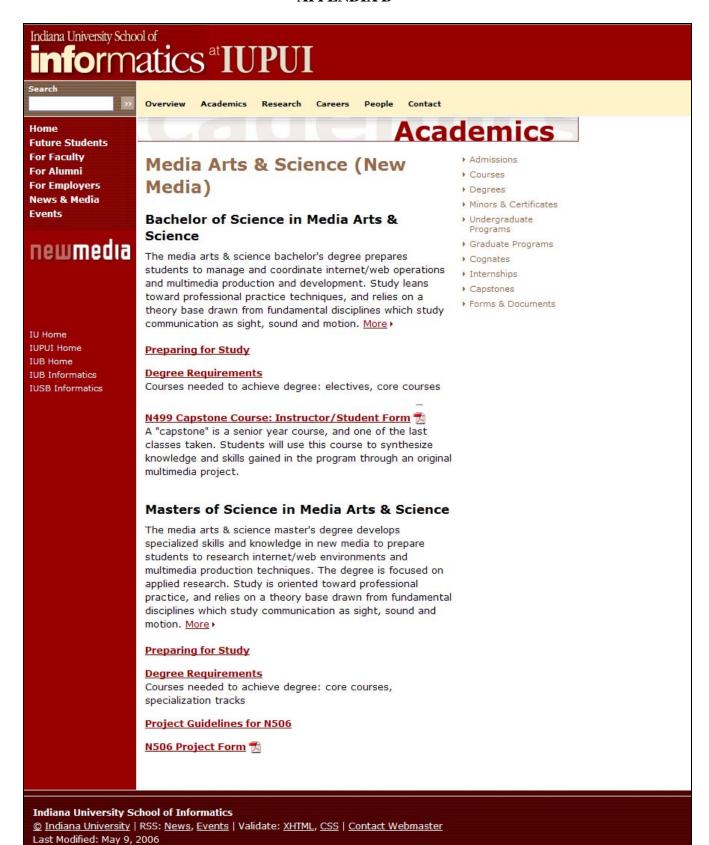
#### APPENDIX C

## MAS Masters Program (36 Credits)

Required Core	0.0		
N500 Foundation of media arts production	3 Credits		
N501 Principles of multimedia technology	3 Credits		
N502 Digital media motion and simulation methods	3 Credits		
N503 Multimedia design applications	3 Credits		
I541 Human-computer interaction 1	3 Credits		
I575 Informatics research design	3 Credits		
I501 Introduction to informatics	3 Credits		
		sub-Total	21 Credits
Electives (Select 3 from this group)			
N505 Internship in media arts and technology	3 Credits		
N510 Web database concepts (P: N503)	3 Credits		
I543 Usability & Evaluative Methods in Interactive Design	3 Credits		
I561 Human Computer Interaction Design 2	3 Credits		
I590 Virtual Worlds	3 Credits		
CS507 Object-Oriented Design and Programming	3 Credits		
CS550 Computer Graphics	3 Credits		
I605 Social foundations in informatics	3 Credits		
X000 Student may select One Elective outside this list	3 Credits		
		sub-Total	9 Credits
Thesis / Project			
N506 MAS Thesis/Project	6 Credits		
2.0 00 2.22 20 2.2 <b>00.0, 2.20,000</b>	5 5155165	sub-Total	6 Credits

**Grand Total** 36 Credits

#### APPENDIX D



#### MAS Web site continued...

M.S. in Media Arts & Science (From: http://informatics.iupui.edu/academics/media/media\_ms\_preparation.php)

### **Preparing for Study**

Back to Media Arts & Science

Successful applicants for admission to the Master's programs must demonstrate the skills and knowledge required for completion of the undergraduate degree in Informatics, to the extent these are relevant to the particular Master's program. These skills are detailed in the B.S. program definition. Typically applicants will have a strong background in Informatics and likely in a specialty related to the particular M.S. program (e.g., Biology for Bioinformatics). Promising applicants who have deficiencies may, with faculty help, select courses that will provide instruction in providing competencies to overcome deficiencies and meet admissions requirements. However, the courses will not count toward the total number of credits required for the advanced degree.

- Degree Requirement: bachelor's degree (with demonstrated technical skills)
- Minimum Overall Grade Point Average: 3.0 (4.0 point scale)
- Letters of recommendation: Three letters of recommendation are required to support the application of admission. Letters of recommendation should include letters from current or recent academic instructors and/or employers
- Scores from the Graduate Record Examination. (Media Arts and Science candidates do not need to submit a GRE score)
- A student's statement of purpose, explaining his or her reason for applying to the
  program and what career path they plan to take upon graduation, is required for all
  programs. A sample of your previous creative work is required for New Media and HCI
  programs. Specific requirements and pre-reqs vary with each program. For details,
  review the program area of interest on this web site

#### **APPENDIX E**

#### BENCHMARKING OF NEW MEDIA CURRICULA OF 8 PEER INSTITUTIONS

With the intention of revising the MAS curriculum over the next several years, the MAS faculty has begun a preliminary benchmarking of new media curricula. The search is based on 12 peer institutions against which IUPUI commonly measures its academic performance. Of the 12 Peer Institutions that were identified by Darrel Bailey in the Sept 2006 Faculty Council Meeting, 8 match the closet to the MAS program at IUPUI.

- 1. University of Utah (Salt Lake, UT) <a href="http://www.film.utah.edu/">http://www.film.utah.edu/</a>
  - a. Program Title: Arts Technology, College of Fine Arts
- 2. University of New Mexico Main Campus (Albuquerque, NM) <a href="http://www.unm.edu/">http://www.unm.edu/</a>
  - a. Program Title: Department of Media Arts
- 3. University of Cincinnati Main Campus (Cincinnati, OH) http://art.uc.edu/eart/
  - a. Program Title: College of Design, Architecture, Art and Planning
- 4. Temple University (Philadelphia, PA) <a href="http://www.templenmic.com/">http://www.templenmic.com/</a>
  - a. Program Title: New Media Concentration
- 5. University of South Florida (Tampa, FL) <a href="http://art.arts.usf.edu/studio.html">http://art.arts.usf.edu/studio.html</a>
  - a. Program Title: The USF School of Art and Art History
- 6. SUNY at Buffalo (Buffalo, NY) http://mediastudy.buffalo.edu/
  - a. Program Title: The Department of Media Study
- 7. Wayne State University (Detroit, MI) <a href="http://www.cfpca.wayne.edu/">http://www.cfpca.wayne.edu/</a>
  - a. Program Title: Media Arts and Studies, within the Department of Communication