



## **Interdisciplinary Master of Science in Information and Communication Technology for Development (MS-ICTD)**

### **Program Description**

#### **1. Description of Program**

##### **1.A. Executive Summary**

The ATLAS (Alliance for Technology, Learning and Society) Institute of the University of Colorado at Boulder offers a Master of Science in Information and Communication Technology for Development (MS-ICTD). This degree program prepares its students for careers in the use of Information and Communication Technology (ICT) to advance people and communities in developing nations, and in underserved and impoverished areas of developed nations. The MS-ICTD program trains individuals who can help bridge the gap between those who enjoy the advantages of the networked information society, and those with the greatest potential to benefit from these advantages, if issues of access, social equity, sustainability, and appropriate design and distribution are addressed.

The program produces agents of positive change who are capable of creating and leading the kind of comprehensive, equitable, and appropriate initiatives that are required to support sustainable community and economic development. ATLAS recognizes that development is a path, not an endpoint, and that the technologies that can contribute to development are varied. To this end, students specialize in the technical and social aspects of technology while acquiring a broad foundation in development studies. In order for ICT-based development interventions to succeed, technological considerations must be balanced with complex social, cultural, political and other issues not related to technology. Achieving this balance is a central tenant of the MS-ICTD program. Graduates of the program work at multinational companies seeking to develop emerging markets, government and non-governmental organizations, foundations and multilateral development agencies.

##### **1.B. ATLAS**

ATLAS creates and facilitates innovative interdisciplinary research, educational, creative, and outreach programs that benefit and enrich society. Using ICT as the enabling force, ATLAS programs bring together students, educators, artists, writers, scholars and leaders from the academy, industry, non-profits, and government to create a multidisciplinary environment that contributes to the understanding of the interaction of ICT and human society, and to the realization of the full potential of that interaction. ATLAS is distinguished by its efforts to establish collaborative multidisciplinary partnerships and programs, by its efforts to prepare, attract and recruit a highly-qualified and diverse student population, and by its efforts to help prepare these students for lives and leadership careers in the networked information age. ATLAS serves as a catalyst for entrepreneurial initiatives between all campus academic disciplines and ICT, and as a campus and community resource in the area of educational technology. ATLAS currently offers several programs that focus on the convergence of technology, learning and society. We have experience understanding how and when to address societal needs with technical interventions, and how to evaluate the outcomes of these interventions. Current ATLAS programs include

a Technology, Media and Society Ph.D., which includes several doctoral students studying ICTD; a Technology, Arts and Media undergraduate minor; the Center for Media, Arts & Performance; and outreach partnerships with K-12 schools and Minority Serving Institutions (MSIs). ATLAS is also home to the headquarters of the National Center for Women and Information Technology, which works nationally to increase the representation of women in all aspects of information technology.

The MS-ICTD program builds on the University of Colorado at Boulder's long-standing and strong commitment to community service. Since Peace Corps' inception, 2,157 alumni of CU-Boulder have served in Peace Corps, making it the number five all-time producer of volunteers. The MS-ICTD program strengthens, rather than competes with, other campus development programs, including the Mortenson Center for Engineering for Developing Communities, the Center for Education on Social Responsibility (CESR) in the Leeds School of Business, and the Developing Areas Research and Teaching (DART) certificate program in Geography. The MS-ICTD program leverages the expertise in these programs, while providing a focal point for the growing number of CU Boulder faculty who are exploring various pieces of the ICTD field.

### **1.C. Program Rationale**

The majority of the world's population does not have adequate access to information or communication. Roughly four billion people (two-thirds of the world's population) live on less than two dollars a day. Among this group, only 1 in 160 has any form of access to the Internet and the information sources that are taken for granted in the developed world. Illiteracy, lack of education and training, lack of power and communication infrastructure and competing community development objectives combine to limit the effectiveness of efforts to introduce ICT-based development solutions in the communities that need them the most. People in developing communities usually cannot benefit from the introduction of telemedicine, distance education, e-government, and other sophisticated Internet and technology-based strategies that are prevalent in the developed world.

In addition, despite billions of dollars invested with the best of intentions, many, perhaps most, ICTD initiatives fail to achieve their development objectives. A potential contributor to this failure is the significant absence of breadth in both the implementation of development efforts, and in the training of those who practice development. Those who work in development tend to communicate only with those most aligned with their particular specialty. Physicians interested in telemedicine generally do not attend computer science conferences where advances in mobile computing are discussed; food security experts do not come to community informatics conferences; computer security experts do not interact with development economists. Researchers and practitioners even within the same community rarely cross paths, particularly when they are separated by significant geographical distances. In addition, development journals and conference proceedings are not read by the communities who are the subject of, and have contributed to, the findings presented; these communities may therefore be unable to put the recommended outcomes into action. Given these disconnects, it is little wonder that the needle barely moves in the overall progress of international and rural development. The MS-ICTD program trains practitioners with the interdisciplinary breadth necessary to strategically and efficiently employ both technology and social science in health, education, and civil service initiatives all over the world, as well as to connect these efforts in order to increase their impact.

Although ICTD is emerging as a formal discipline at several universities internationally, only a few programs related to ICTD exist in the United States; ATLAS currently offers the only master's program in ICTD in the nation. As a research area, ICTD is emerging as a clearly identifiable focus with dedicated journals and conferences, although the number of ICTD-related global initiatives is swiftly growing, as are the dollars being invested in ICTD as a key development strategy.

## **1.D. Program Goals**

Students in the MS-ICTD program study ways in which ICT can best support sustainable development, while investigating issues of globalization, policy, health, livelihoods and capacity building, gender and entrepreneurship. Students learn to evaluate both the potential societal benefits and the societal consequences of ICT introduction and expansion. They examine ways in which ICT can be used to advance people and communities in developing nations, and in underserved and impoverished areas of developed nations. Students are led to explore the technical, social and cognitive effects of the “digital divide,” while investigating the necessary factors to advance digital inclusion. In addition to technical and development courses, students take courses that provide a foundation in development economics, fieldwork methods, community assessment and social entrepreneurship. After three semesters of coursework, all students engage in a semester-long practicum in the field, where they acquire experience with real-world development programs.

Upon graduation, ATLAS MS-ICTD students will have learned how to:

- Acquire the integrated knowledge required to effectively use Information and Communication Technology to advance community development worldwide;
- Understand essential relationships between technology, culture, and development theory and practice;
- Understand how access, social equity, sustainability, and appropriate design and distribution influence development outcomes;
- Collaborate effectively with practitioners from multiple disciplines in the creation, deployment and evaluation of development solutions;
- Have participated significantly in at least one development project, thus bringing practical experience to their future employment; and
- Compete successfully for jobs at multinational companies seeking to enter emerging markets, government and non-governmental organizations and community-based organizations engaged in development, and where appropriate, further graduate study in pursuit of a doctorate.

## **2. MS-ICTD Program Admission**

### **2.A. Student Profile**

Students applying to the MS-ICTD come from a variety of backgrounds. In particular, we seek applicants from three distinct groups – high technology/engineering, international development and students from the Global South<sup>1</sup>. We anticipate that most students will not enter the ATLAS MS-ICTD program directly after receiving an undergraduate degree. Rather, program applicants likely have relevant experience, and thus the associated maturity and self-direction required to succeed in the program. ATLAS is also interested in matriculating students who have significant international experience, including Foreign Service, Peace Corps, or military service veterans. These individuals have first-hand experience with the complexities of developing regions, and are aware of what they, as students, do not know. This group also includes those who have personally witnessed the failure of well-intentioned development initiatives.

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<sup>1</sup> The term “Global South” refers collectively to the large area of the developing world that is generally in the southern hemisphere (Australia and New Zealand are notable exceptions). The distinction is both socio-economic and political; four out of five permanent members of the United Nations Security Council and all members of the G8 lie north of the equator.

The MS-ICTD program also seeks to enroll students who have development experience, or who have lived in the Global South. Such students can speak from first-hand experience concerning the economic, social, cultural, and political environment in which ICTD efforts are initiated, offering invaluable perspective to Western students. Students native to the Global South typically have great difficulty accessing education outside their region, and those without monetary support have little chance, outside of exchange programs such as those sponsored by IIE/Fulbright, to come to US institutions. To the extent possible, highly-qualified applicants who seek to effect change within their societies will be identified and offered financial aid to help enable their enrollment in the MS-ICTD program.

## **2.B. Workforce demand**

As new Information and Communication Technologies are created and deployed in developing regions, it is critical to the success of such efforts that individuals capable of working at the intersection of technology and development lead the process. The ATLAS MS-ICTD program attracts some of the most highly qualified individuals who wish to work in ICTD. At present, the ATLAS MS-ICTD program is the only academic program in the nation designed specifically to train such individuals, thus providing a unique avenue for the education and professional training of current corporate employees. Graduates of the MS-ICTD program have specific skills that can benefit project deployment and evaluation in developing regions.

The program endeavors to be an increasingly valuable resource for current employees of corporations with interests and programs in developing nations. We anticipate that program applicants seek to use ICT to increase the impact of social and economic development strategies, thereby facilitating faster and more equitable advancement. Similarly, the increasing focus of technology companies and businesses on developing regions as potentially lucrative markets calls for technologists to understand the theories, policies and best practices in the development field. ATLAS has strong relations with many regional and multinational organizations and companies working in developing regions, and is well-positioned to build a strong professional and academic community between highly-qualified MS-ICTD students and these companies. The relationships and networks thus created provide important professional, research and employment networking opportunities for these companies, who have unique access to students for internships, research partnerships, and as potential future employees. In addition to the human benefits of the program, the direct benefits to participating companies include an educational path for its employees who require training in this area, access to a pool of well-trained potential employees, and the opportunity to develop a relationship with these individuals during their education, especially during the practicum semester.

## **2.C. Admission, Transfer and Graduation Standards**

The MS-ICTD degree program, like all graduate degree programs at the University of Colorado at Boulder, falls under the purview of the Graduate School. Its policies and procedures govern all aspects of administration of the degree program. All applicants must meet the Graduate School Minimum Admissions Standards published by the Dean of the Graduate School. In addition, there are program-specific procedures, which are described below.

Applicants to the ATLAS MS-ICTD must have demonstrated outstanding achievement, and must possess the maturity and self-direction necessary to succeed in an interdisciplinary program of this kind. Evidence of previous interdisciplinary or development work is desirable and will strengthen an application. The minimum admissions requirements for application to the ATLAS MS-ICTD program are as follows:

## **General Requirements**<sup>2</sup>

1. Applicants must hold a baccalaureate degree from an accredited college or university, or have done work equivalent to that required for such a degree.
2. Applicants must show promise of ability to pursue advanced study and research, as judged by the student's scholastic record.
3. Applicants must have adequate preparation to enter the MS-ICTD program.

## **Specific Requirements of the ATLAS MS-ICTD Degree Program**

1. Applicants must have a cumulative undergraduate grade point average of at least 3.25 (out of 4.0) from an accredited university in the United States, or equivalent credentials from a non-U.S. institution. Applicants who do not meet this undergraduate standard may still apply if they have taken at least 12 credit hours of graduate classes and possess a graduate cumulative grade point average of at least 3.5 on a 4.0 scale.
2. Applicants must have a cumulative score on the Graduate Record Examination of at least 1150 (verbal + quantitative), with a score of at least 550 on the verbal examination. Applicants who possess an earned terminal graduate degree (e.g., Ph.D., J.D., M.D., or Ed. D.) may request a waiver of the GRE requirement. Such waivers will not be granted automatically.
3. International applicants who have not attended an English-speaking university must submit TOEFL scores. Minimum requirements: 600 PBT or 250 CBT or 100 IBT.

Applicants with substantial relevant experience (e.g., Foreign Service, Peace Corps, Military Service, NGO or corporate leadership, or governmental service) who do not meet all of the ATLAS MS-ICTD specific admissions requirements may still apply, requesting the waiver of a specific ATLAS MS-ICTD admissions requirement (general requirements may not be waived). Documentation of the relevant experience should be included with the application.

All applicants must provide the following:

- Three official copies of all transcripts. Transcripts must be issued to the University of Colorado at Boulder, or to ATLAS. They may not be issued to the student.
- At least three letters of recommendation from individuals who are able to judge the student's ability to succeed in an interdisciplinary graduate program involving both information and communication technology, and social science.
- A two-page Statement of Purpose detailing the applicant's academic and professional objectives.
- GRE<sup>3</sup> scores sent directly to ATLAS or to the University of Colorado.
- TOEFL<sup>4</sup> scores, if applicable, sent directly to ATLAS or to the University of Colorado.
- Résumé or curriculum vitae

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<sup>2</sup> These General Requirements are taken directly from Article II, Section 2 of the University of Colorado at Boulder Graduate School Rules.

<sup>3</sup> Graduate Record Examination

<sup>4</sup> Test of English as a Foreign Language

## **Transfer Standards**

Transfer credits from accredited institutions will be accepted only upon approval by the ATLAS MS-ICTD Program Director. Acceptance criteria are based on the transfer credit guidelines established by the Graduate School<sup>5</sup>. Students seeking to transfer credits should request the MS-ICTD Credit Transfer Statement prior to applying to the program.

## **Combined Bachelor/Masters Consideration**

A student who has fulfilled all graduation requirements in a degree program at the University of Colorado may apply and be admitted to the MS-ICTD program without having yet graduated from their undergraduate program. Thus, students who have completed their primary degree requirements, but are still in process of completing honors work, a double major or a minor/certificate, are able to apply while simultaneously finishing their second degree or minor. In these specific circumstances, students may apply to the MS-ICTD program, and if admitted, will be admitted to the BA/BS/MS track of the MS-ICTD program. These students will, upon completing their secondary undergraduate requirements, be able to graduate from their undergraduate program(s) and convert to full-time MS-ICTD students. Students wishing to pursue this route must have the prior written approval of the MS-ICTD Faculty Director, and be in excellent academic standing (3.75 or above GPA in completed degree work).

## **Combined Masters programs**

ATLAS is currently exploring the possibility of collaborating with other masters program on campus to allow interested students the opportunity to pursue joint degrees. While no official partnership has been established, interested candidates should contact the MS-ICTD Faculty Director.

## **Academic Good Standing and Probation**

Students in the MS-ICTD program must maintain a minimum cumulative grade point average (GPA) of 3.0 to remain in academic good standing. No grade below C will count toward completion of the MS-ICTD degree requirements. Courses taken toward the fulfillment of requirements for the MS-ICTD degree may not be taken pass/fail. Students whose cumulative GPA falls below 3.00 will be placed on academic probation and given two semesters in which to raise their cumulative GPA to 3.00 or above. The specific rules governing academic standing and probation are detailed in the Graduate School Rules<sup>6</sup>.

## **Graduation Requirements**

The MS-ICTD degree requires satisfactory completion of thirty-six credit hours, comprised of ten approved graduate courses, plus six hours of practicum. Each student must have a Degree Plan, approved by the MS-ICTD Faculty Director, which enumerates the ten courses to be taken. The grades in all course work counted toward degree completion must be C or above, and the cumulative GPA must be 3.0 or above. Students must also complete a final practicum report. Satisfactory completion of this report, and the courses specified on the student's Degree Plan, will document that the student has satisfactorily completed an intellectually coherent graduate education in the field of Information and Communication Technology for Development.

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<sup>5</sup> <http://www.colorado.edu/prospective/graduate/academics/credittransfer.html>

<sup>6</sup> [http://www.colorado.edu/GraduateSchool/policies/\\_docs/GraduateSchoolRules.pdf](http://www.colorado.edu/GraduateSchool/policies/_docs/GraduateSchoolRules.pdf)

### **3. MS-ICTD Curriculum**

#### **3.A. Curriculum Description**

The MS-ICTD program provides an interdisciplinary, globally-focused and practice-oriented curriculum that is designed to produce individuals who are capable of using ICT to help address the complex and inter-related challenges associated with poverty and inequity. In addition to developing a broad foundation in development theory and practice, MS-ICTD students explore the disciplinary inter-relationships that impact the success of development initiatives. They learn how an understanding of these interrelationships creates opportunities to holistically approach development, and how a lack of understanding can exacerbate or introduce inequities among class, race, caste or tribe, gender, age and experience.

The MS-ICTD degree program consists of eleven graduate courses in the areas enumerated below; the actual courses corresponding to each area depends on the student's particular background and interest. Working with the MS-ICTD Program Advisor and Faculty Director, each student develops a Degree Plan that matches their particular interests and experience.

1. Global Development I (Theories, Policies, Institutions, Alternatives)
2. Global Development II (Current Development trends taught by experts in residence, including Development Economics, Global Health, Gender, Globalization and Migration, and Agriculture and Development, among others)
3. Case Studies in ICTD
4. Technical Elective I
5. Technical Elective II
6. Technical Elective III
7. Fieldwork Methods for ICTD Practitioners
8. Social Entrepreneurship Elective
9. ICTD Project Laboratory
10. Elective related to development sector of interest
11. Practicum

A typical degree plan is depicted below:

	<b>Fall Semester</b>	<b>Spring Semester</b>
<b>Year 1</b>	ICTD Case Studies Global Development Technology Elective I*	Fieldwork Methods for ICTD Practitioners Global Development II Technology Elective II*
<b>Year 2</b>	ICTD Laboratory Social Entrepreneurship Technology Elective III* Domain-specific elective **	Practicum

### **Core MS-ICTD Courses**

#### **ATLS 5510: Global Development I**

Introduces students to the history of development, the major theories of development studies, and the policies and institutions that have shaped development as it exists today. The course examines the role of multilateral agencies, foundations, aid organizations, corporate entities and academia in development as both an industry and a research field. The course focuses on development movements and their outcomes, the inter-related nature of development and its effect on policies and programs, and alternative development strategies.

#### **ATLS 5220: Global Development II**

Explores the impact of economic, geographical and social/cultural conditions on development outcomes through standalone course components taught by subject matter experts. Course topics may include development economics, environmental sustainability, public health, climate change, globalization and migration, religion, and gender as these broad themes relate to development. Builds upon Global Development 1, offering a practical, holistic study of the development applications and trends that have emerged from development policies and frameworks.

#### **ATLS 5230: Case Studies in ICTD**

Serves as a foundation course for the MS-ICTD program. Students read and evaluate case studies in ICTD across a wide range of technologies, applications and development domains. The tenets of good ICTD program design, deployment and evaluation are introduced, and current projects in ICTD practice and research are examined. Students learn how to create and leverage technologies in order to serve human and environmental needs, are introduced to the seminal work of leaders in the field, and discuss the future of ICTD as an emerging area of academic and agency focus.

#### **ATLS 5250: Practitioner Fieldwork Methods**

Introduces the methods and models that can be employed in ICTD program development and deployment. Examines the applications of participatory research, value-centric design, program scale, cross-disciplinary work, and appropriate monitoring and evaluation. Course topics include the identification and use of development indicators, qualitative and quantitative approaches to project appraisal, practical issues of data gathering and analysis, as well as funding and sustainability. A goal of this course is to build student confidence around existing evaluation toolkits and methods, while advancing multi-method approaches to designing and analyzing ICTD initiatives.

#### **ATLS 5240: ICTD Project Laboratory**

Prepares students for the semester-long practicum. Students work in teams to design ICTD interventions that address unique socio-economic, cultural and environmental development issues. Teams design a

variety of ICTD interventions, including mobile health and education programs, communication networks, and pro-development ICTD policies. Topics are chosen by teams and guided by program faculty and external domain experts.

### **ATLS 6910: MS-ICTD Practicum**

Students work in the field to apply what they have learned in the previous three semesters to a specific ICTD initiative. Practicum assignments are arranged under the supervision of the MS-ICTD Program Director and include work with a non-governmental organization, development agency or similar technology/policy entity, or with an emerging market corporate organization. Students may focus on ICTD design, deployment, monitoring and evaluation, or research. Students stay in close contact with program faculty to ensure that practicum educational objectives are met, and write a final report summarizing their practicum work.

### **Technology and Business elective courses**

Students in the MS-ICTD program choose three courses from different computer science, engineering and telecommunications disciplines. Two of those courses must be a lab course (either software, hardware, or a combination.) Students must also take one social entrepreneurship course from the business school.

Note: not all courses may be offered every year, or have space available; instructor permission may be required for enrollment into certain courses. Students lacking pre-requisite may be required to complete all pre-requisites prior to enrollment. Some pre-requisites may not count towards the overall MS-ICTD degree. MS-ICTD students work with the MS-ICTD Faculty Director to create a course plan.

ATLAS may offer courses not listed below that fulfill technical elective requirements. These courses may be taught by visiting faculty or ATLAS Faculty Fellows on a semester basis.

### ***Technical Electives***

#### **ICT 1: Systems**

CSCI 3002: Human-Centered Computing Foundations  
CSCI 3287: Database and Information Systems/Information Systems Technology  
CSCI 5273: Network Systems  
CSCI 5342: Groupware and Workflow Systems  
CSCI 5473: Applied Operating Systems  
CSCI 5573: Advanced Operating Systems  
CSCI 5673: Distributed Systems  
CSCI 6268/TLEN 5550: Foundations of Computer and Network Security  
CSCI 7143: Topics in Computer Systems: Mobile Computing  
TLEN 5310: Telecommunications Systems  
TLEN 5400: Network Design and Optimization  
ECEN 5613: Embedded System Design  
ECEN 5623: Real-Time Embedded Systems

#### **ICT 2: Communications**

ATLS 5519: Mobile Application Development  
CSCI 6268: Foundations of Computer and Network Security  
CSCI 7143: Topics in Computer Systems: Mobile Computing  
ECEN 5643: Software Engineering of Concurrent Systems  
ECEN 5692: Principles of Digital Communication  
ECEN 5743: Software Engineering of Distributed Systems

ECEN 5797: Introduction to Power Electronics  
TLEN 5330: Data Communications 1  
TLEN 5340: VoIP Network Design  
TLEN 5350: Satellite Communication Systems  
TLEN 5430: Data Communications 2  
TLEN 5440: Multimedia Networking  
TLEN 5460: Telecommunications Lab  
TLEN 5462: Advanced Telecommunications Lab  
TLEN 5470: Signaling Protocols  
TLEN 5480: Introduction to Optical Fiber Communications  
TLEN 5490: Network Programming  
TLEN 5510: Wireless and Cellular Communications  
TLEN 5520: Wireless Local Area Networks  
TLEN 5550: Computer and Network Security

### **ICT 3: Applications**

ATLS 5519: Social Media for Social Good During Crises  
ATLS 5519: Mobile Application Development  
CSCI 3112: Human-Centered Computing Professional Development  
CSCI 3308: Software Engineering Methods and Tools  
CSCI 4810: Seminar in Computational Biology and Health Informatics  
CSCI 4830: Special Topics in Computer Science: Future of Library Science and Computer Science  
CSCI 4839: User Centered Design  
CSCI 5513: Real-Time Hardware-Software System Design  
CSCI 5448: Object-Oriented Analysis and Design  
CSCI 5548: Software Engineering of Stand Alone Programs  
CSCI 5608: Software Project Management  
CSCI 5828: Foundations of Software Engineering  
CSCI 6302: Speech Recognition and Synthesis  
CSCI 6838: User Interface Design  
CSCI 7000: Human Computer Interaction: Survey & Synthesis  
CSCI 7000: Topics in Computer Systems: Game Design for Education  
CSCI 7000: Introduction to Robotics  
CSCI 7000: Topics in Computer Systems: Inference, Models and Simulation for Complex Systems  
CSCI 7000: Current Topics in Computer Science: Mobile Interfaces  
ECEN 5672: Digital Image Processing  
GEOG 5103: Introduction to Geographic Information Science  
GEOG 5203: Geographic Information Science: Modeling Applications  
GEOG 5303: GIS Programming for Spatial Analysis  
TLEN 5140: Digital Business Strategies  
TLEN 5010: Network Economics and Finance  
TLEN 5300: Telecommunications Theory and Applications  
TLEN 5380: The Future of Video: Technology, Policy and Economics  
TLEN 5390: Applied Java Programming  
TLEN 5410: Network Management & Operations  
TLEN 5462: Advanced Telecommunications Laboratory  
TLEN 5490: Network Programming  
TLEN 5530: Applied Network Security  
TLEN 5540: Network Security Lab  
TLEN 5560: Wireless Systems Lab  
TLEN 5570: IP Network Design

TLEN 5830: Smart Grid Technology  
TLEN 5832: Software Defined Radio  
TLEN 5832: Telecommunications Application Programming  
TLEN 5832: Privacy, Security, and Digital Rights Management  
TLEN 5834 Information Technologies and Communications  
TLEN 5832 Special Topics: Software Defined Radio  
TLEN 5839 Cognitive Radios

***Social Entrepreneurship electives***

MBAX 6100: Entrepreneurship and Small Business Management  
MBAX 6120: Entrepreneurial Marketing  
MBAX 6130: Sustainable Venturing  
MBAX 6320: International Marketing Management  
MBAX 6350: Marketing of High Technology  
MBAX 6360: New Product Development  
MBAX 6410: Business Process Design  
MBAX 6420: IT and Business Strategy  
MBAX 6440: Project Management  
MBAX 6803: Microfinance  
MBAX 6825: Sustainable Business  
MBAX 6845: Social Entrepreneurship for Emerging Markets

Note: only 6 hours of courses numbered 3000 and/or 4000 may be counted towards the MS- ICTD degree.

\*\* Domain specific electives may include courses across a variety of disciplines, including Sociology, Geography, Journalism, Mass Communication, Anthropology, Gender Studies, Political Science, Engineering, Law, Business or Foreign Languages. Students may choose to take their free elective during any semester.

**3.C. Typical Curriculum Progression**

**Year 1**

Year one provides students with an understanding of the interrelated nature of development studies, and the role that ICTD can play in advancing single-sector and cross-sector development initiatives. In the Global Development courses, students learn the fundamentals of development history and theory, development economics, the policies and institutions that shape development practice, and current trends and movements in development work. These courses look at development through a series of modules in major topics including globalization, migration, microfinance, trade, health, agriculture and gender. Students take two core ICTD courses – a case studies course that critically evaluates ICTD initiatives in order to develop an understanding of why only a small number of ICTD projects succeed, and a course specific to methods and frameworks useful in ICTD interventions. Students also take two of the three core ICTD technical courses, based upon each student’s academic and professional experience and interests.

**Year 2**

Year two introduces students to ICTD practice. As a cohort, students participate in an additional core ICTD course – a project-based laboratory in which small teams of students develop an end-to-end ICTD intervention for a specific development need, including design, implementation and evaluation. Students complete their third course in the technical series, as well as a social entrepreneurship course. This course helps create an understanding of the business perspective of ICTD, as well as skills and market-building

opportunities for communities engaged in ICTD projects and outcomes. Students also take an elective of their choosing in order to gain additional depth or breadth in a development topic of interest.

### **Practicum**

The fourth semester is dedicated to the Practicum. Under faculty supervision, the six-hour practicum consists of an internship or service project with a company engaged in ICTD efforts, an international development agency, foundation, non-governmental organization, or other organization in the public or private sector. If approved by the Program Director, students who already have a relationship with an existing development project or organization may be able to fulfill their practicum requirements within that context.

A key strength of the program is the partnerships that are in place to support practical training opportunities for MS-ICTD students. The program leverages existing connections with the ATLAS Institute Advisory Board, affiliate programs, and industrial and research partners. Several organizations have demonstrated interest in engaging students who can immediately add value to their organization's development-based initiatives. Technology companies with wireless and emerging market divisions may offer practicum opportunities. In addition to the practitioner's gap that MS-ICTD students can fill for industrial partners, several development-focused and civic organizations have an unmet need for broadly-trained practitioners to design, implement and evaluate development programs. In addition, ATLAS doctoral students focusing on international development are likely to provide opportunities for MS-ICTD students to partner with ongoing ICTD projects as part of their practicum.

### **3.D. Important program dates**

Applications are due for Fall 2012 by March 1st, 2012. Please plan accordingly, especially if you are in a region with limited GRE and TOEFL testing opportunities. The MS-ICTD program only offers Fall admission.

For more information, contact Dr. Revi Sterling, Faculty Director, at [revi.sterling@colorado.edu](mailto:revi.sterling@colorado.edu), or Vickie Stubbs, Program Administrator, at [vickie.stubbs@colorado.edu](mailto:vickie.stubbs@colorado.edu).