

# MIT-Africa Internet Technology Initiative



## Summer 2005 Participant Handbook

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## Table of Contents

Introduction .....	3
About MIT-AITI .....	3
Expectations .....	3
Time Commitment .....	3
Personal Commitment .....	4
Resourcefulness .....	4
Before Leaving MIT .....	5
Trip Logistics .....	5
Responsibilities of the Team .....	5
Mandatory Class Attendance .....	5
Choosing Team and Curriculum Leaders .....	5
Getting to Know Each Other .....	6
In Africa .....	7
Responsibilities .....	7
Team Leader .....	7
Curriculum Leader .....	7
OpenCourseWare Leader .....	8
Logistics Leader .....	8
Entrepreneurship Leader .....	8
Everyone .....	8
Teaching Java .....	9
Forming Standard / OCW Tracks .....	9
Lecturing .....	9
Evaluating Students .....	9
Evaluating Your Teaching .....	10
Self-Learning / OCW Initiative .....	10
Distributing Certificates .....	11
Teaching Entrepreneurship .....	11
Finding and Contacting Local Businessmen for Guest Lecturers .....	11
Entrepreneurship Competition .....	12
Additional Activities .....	12
MIT-AITI Press Information .....	12
Emergency Information .....	13
Scenarios .....	13
Contact Information: Embassies and Hospitals .....	14
Back at MIT .....	16
Post-Trip Interview .....	16
Final Report .....	16
Presentations .....	16
Further Involvement .....	16
Appendix .....	17
MIT-AITI Executive Summary – November 2004 .....	17
SLI / OCW Report – Fall 2004 .....	17
2004 Summer Reports .....	34
Ghana .....	34
Kenya .....	74

## **INTRODUCTION**

### **About MIT-AITI**

The MIT-Africa Internet Technology Initiative (MIT-AITI) is an innovative program created by MIT students that integrates computers and internet technology into the education of students in African schools. The program focuses upon programming principles, cutting-edge internet technology, free open-source systems, and even an entrepreneurship seminar to introduce students in Africa to the power of technology and to equip them with skills that will allow them to be creative, resourceful, and prosperous. The mission statement of the AITI program is based on the idea that information technology carries the potential to empower people around the globe with knowledge. Given this belief, which has been echoed by the United Nations Secretary General Kofi Anan, African students need to be equipped with the tools and skills necessary for the development of information technology. The AITI program is implemented with emphasis on classroom teaching, community-oriented projects, and independent learning.

MIT-AITI achieves this goal by sending MIT students to three African nations in order to teach both students and teachers through intensive classroom and lab sessions for six weeks. Hence, MIT-AITI provides MIT students with an opportunity for community service where they can apply their extensive engineering skills. Moreover, MIT-AITI creates a long-term cultural and technical understanding between MIT and African educational institutions.

The vision of MIT-AITI is not only to teach students in the classroom, but also to have a significant impact on the participating schools and communities. Throughout the past five years, students have succeeded in attaining jobs in their local IT industry. They also have been involved in web development for local community initiatives. The program aims to serve a wide audience across gender and income levels. Also, MIT-AITI has succeeded in improving the quality of education at the schools by instructing African teachers and equipping them with the necessary knowledge set to further develop the curriculum at each school.

### **Expectations**

#### **Time Commitment**

AITI is a significant time commitment that expands beyond your summer experience. In addition to the work you put in during your time in the country, you are expected to work before and after to help AITI reach its goals.

Before the program, you are to enroll in a 6-unit seminar, SP.772, which will prepare you for your experience abroad. You will learn about your respective country, develop teaching and curriculum development skills, and build a strong team relationship. There will be one hour lectures twice a week, as well as a three hour session

on Saturdays to teach students from local community colleges. In total, expect the pre-trip commitment to be about six or seven hours a week. It is well worth it, as it will make your experience in the country easier and more enjoyable.

During the summer, a typical day may be six hours of time in class and the lab. There will definitely be a few hours a week needed for preparation time and correcting assignments. There may be extra time commitments as well, depending on the country you are in. A few hours during the program may be needed for events such as the Lego MindStorm class or the college information sessions.

After the program, the time commitment is what you make it. The only requirement is the completion of a team final report. However, we definitely expect that participants will stay involved in AITI after and help us achieve our goals.

### **Personal Commitment**

It is expected that all participants will be fully dedicated to the purposes and goals of AITI before, during, and after the program. Participants must take the seminar in the Spring seriously, as it will affect the success and effectiveness of the program in the summer. During the summer, students must always realize that they are representatives of MIT and AITI, and they are often the only impression people will have. Also, the majority of the work for the program takes place after the summer. AITI is always looking for people who are willing to make a long term commitment to the program and to extend their involvement. There are many ways to stay involved, such as through fundraising, curriculum review, publicity, event planning, etc. There are definitely ample opportunities to help AITI reach its goals and we need all the help we can get.

### **Resourcefulness**

While in Africa, you will be thousands of miles away from the AITI leadership. Communication will not be easy, so it is not feasible to expect the AITI leadership to solve every minor problem you may encounter. The expectation is that you will use all of your resources in your country to solve or approach problems. Many of the administrators or students in the schools can be very useful in helping your team overcome the many problems you will face. However, if there are any legal or medical problems, do NOT hesitate to get in contact with the AITI leadership.

## **BEFORE LEAVING MIT**

### **Trip Logistics**

Before leaving for your country, there are several things you need to have in order:

- **Valid passport and visa:** All participants must have valid passports. Information for obtaining U.S. passports can be found at [http://travel.state.gov/passport/passport\\_1738.html](http://travel.state.gov/passport/passport_1738.html).

Passports take about six weeks to obtain, so make sure you apply early. You will also need passport photos and to apply in person, in addition to filling out the application and bringing the appropriate forms.

All participants must also obtain a visa. The forms that must be completed to apply for a visa can be found at:

[http://www.kenyaembassy.com/forms/visa\\_form.htm](http://www.kenyaembassy.com/forms/visa_form.htm)  
[http://www.ethiopianembassy.org/visa\\_app.pdf](http://www.ethiopianembassy.org/visa_app.pdf)  
<http://www.traveldocs.com/gh/visa.pdf>

- **Immunizations:** You should have all of the appropriate immunizations before leaving the U.S. A yellow fever immunization card is required to enter all of the countries. More details of what exactly to get shots for will be provided in a class lecture with MIT Medical. You can set up appointments with MIT Medical for travel physicals.
- **Health insurance:** All participants must have health insurance that will cover them in their country they will be staying in. Check with your existing health insurance provider to see if you are already covered in other countries. If not, you should purchase supplemental traveler's insurance.

### **Responsibilities of the Team**

**Mandatory Class Attendance:** Attendance in the SP.772 seminar is mandatory. Lots of crucial information will be disseminated at the class meetings, and the Saturday sessions are essential for preparing you to teach students.

**Choosing Team and Curriculum Leaders:** Essentially everyone in the team will have a leadership position. These positions are: Team leader, Curriculum leader, OpenCourseWare leader, Logistics leader, and Entrepreneurship leader. The details of the positions are described later in this document. All participants are expected to fully take care of their responsibilities to the team. You should assign positions based on people's experience, interests, and skill.

**Getting to Know Each Other:** Building and maintaining a strong team is perhaps the most important part of the program. Much of the success you will encounter will come from having a dedicated team. The people you go to your country with will be with you for almost all hours of the day. You will live, work, eat, travel and have fun together. Therefore it is essential to have a good relationship with everyone in the team. Try to build this dynamic before you depart for the program. While you will be working together a lot in the coming months, you should also definitely get to know each other and learn about everyone's personalities. Meet with one another in non-academic environments- grab dinner as a team or hang out together. It will pay off immensely while you are working hard in Africa and it will make the experience an enjoyable and successful one.

## IN AFRICA

### Responsibilities

#### Team Leader

- Assigning responsibilities to other participants:
  - printing and distributing any study materials;
  - ensuring the safety of AITI equipment
  - updating the team's website during the duration of the program
- Collecting materials for weekly reports from team-members and sending the reports to AITI officers, and liaising with AITI officers in Boston about any issues that come up.
- Being in charge of emergencies in terms of getting in touch with MIT (See Emergency Info)
- Conducting evaluation surveys for students on the quality of teaching and of the success and problems.
- Coordinating the production of a final report after the program.
- Helping in organizing trips of the team around the country, leisure in the city.
- Dealing with any group problems that arise
- Getting in touch with the press about AITI with the help of AITI leadership (See Press)

#### Curriculum Leader

- Ensure that all the appropriate software is installed in the lab locations prior to the first class. This will require a trip to the location one or two days before to do the necessary installations. Consult with the Team Leader and Logistics Leader about arranging transportation.
- Prior to the first class, assign responsibility for each lecture and lab to a team member or pair of team members. It is the job of the team members to review their assigned lectures, revise them if they see a need to, and practice their lectures in front of a group of members two nights before they are to give the lecture.
- Make certain that each lab is reviewed and revised in advance by the person who will administer it. Note that the content of the lectures may have been changed, and as a result, the labs may need to be modified accordingly.
- For the quizzes, it is recommended that two or more team members take the quiz two days in advance to root out any problems ahead of time. Again, the lectures may have been modified by the time quiz day comes, and the quiz may need to be changed to reflect that. Also, the quiz may be too long or too short for the amount of class time you have; in that case, the team should decide on questions to add or remove.
- Finally, it is important to note that the curriculum you start with is by no means set in stone. If it works for your students as is (as we hope it will), then so be it.

But if it needs to be changed, feel free to do so. Students' abilities, class durations, quality of computers, and other important factors will all vary from country to country and year to year, and you may need to tailor the curriculum somewhat to reflect that.

### **OpenCourseWare Leader**

- In charge of administering the OCW course. Decide who will check in with the students on a daily basis and answer any questions they may have.
- Select the students to participate in the OCW track. It may be helpful to ask the students in a pre-class survey if they would be willing to participate in a self-learning project that may be more advanced than the standard track.
- May need to think on feet to give OCW students more challenging assignments or ways to extend their learning beyond the set curriculum. Should be familiar with JSP.
- Track progress of the OCW students.

### **Logistics Leader**

- The main liaison between your team and the administrators and faculty at your school(s).
- Organize trips for leisure around the country.
- Make sure transportation is organized to work and all other places.
- Help with arranging for entrepreneurship.

### **Entrepreneurship Leader**

- Make sure that all entrepreneurship seminar speakers are contacted by the first week of arriving in the country. So that you have an idea of when they will be available to come and tailor your lectures according to their availability.
- Ensuring that the entrepreneurship competition posters are put up from the first week of classes.
- Organizing who will teach the lectures and run the activities.

### **Everyone**

- Teaching java and entrepreneurship
- Being on time to leave for classes
- Aiding the Team Leader in writing weekly reports
- Report all problems in teaching process as soon as possible to the Team Leader.
- Discuss and find solutions to these problems during weekly team meetings
- Grade problem sets, tests and other assignments
- Provide feedback, comments and suggestions to team members about teaching
- Contribute towards the final report after the program
- Surveys/gathering feedback from students



## **Teaching Java**

### **Forming Standard / OCW Tracks**

There are several ways to split the students into OCW and standard lecture tracks. The 2004 Ethiopia team simply asked the students whether they wanted to try the self-learning initiative. The 2004 Ghana team met with a professor and had the professor recommend who would do well in the course. This particular method did not work out too well. The 2004 Kenya team used a more complex and drawn out approach, but it was very successful. They asked students in a pre-class survey if they would be interested in setting their pace through a self-learning initiative. Then after the first exam was administered, students who performed well and also expressed interest in the OCW track were invited to join. It was extremely successful and almost all of the students thrived.

### **Lecturing and Labs**

You will most likely spend the majority of your time lecturing the students on Java. The curriculum has lecture slides already made for you. However, it is strongly recommended that you go over the slides and make any changes you feel are appropriate. In addition, you should always come prepared to lecture. That includes practicing and being familiar with the information, coming up with extra examples, and having a backup plan in case you have extra time.

Try to make lecture as interesting as possible. It can be very dry at times, but how you present it can make a boring topic seem more interesting. Coming up with fun or relevant examples can help as well. Make sure students fully understand what you are teaching. You may need to probe the students a little more to see if they really have any questions. Sometimes you may need to abandon a lecture and hold reviews of past material. Be prepared to adjust on the fly, as students' needs may always change.

With the actual presentation of the material you will probably need to experiment with what volume, style, and speed to speak with. Always get feedback from your students to make sure they can understand you.

Labs are the only time students get a hands-on experience with what they are learning. While in the lab, help the students with the lab whenever they ask. Sometimes you will feel overwhelmed and will have too many people asking for help at the same time. It may be best to start a help queue to help you manage the situation and be as fair as possible. Also, encourage the students to help each other out, but watch out for students just giving out each other's code. When you check off labs make sure the student has an understanding of the key concepts of the lab by asking them some basic questions about the lab.

### **Evaluating Students**

There are several ways you can evaluate the students, and it is up to you on how you want to do it. There are labs, quizzes, a final project, and class participation that you can take into account someone's grade. You can take these measures as well as more

qualitative measures such as effort and improvement to make a full assessment of a student's work.

### **Evaluating Your Teaching**

Feedback is one of the most important things you can get from your students. Gathering feedback using written evaluation forms is usually good, but sometimes you might want to have a discussion with the students about how things are going. It will help you adjust your teaching style and improve the quality of the class immensely. Make sure you find out if your pace of teaching the material, speaking speed, and volume are appropriate. If students feel you need to give more examples, start using more examples in class. Take feedback often so you can always know how the students feel about your team's teaching as well as the progress of the course in general. You may be surprised by what they are thinking—so just ask!

### **Self-Learning / OCW Initiative**

The actual teaching of the OCW portion of the Java course is extremely flexible. The goal is to give students the opportunity to learn at their own pace the material using MIT's OpenCourseWare notes from 1.00 Introduction to Computers and Engineering Problem Solving. It teaches students the important skill of self-learning. This also allows advanced students to expand on the material however they would like to. So in the OCW track students will essentially be given free reign to learn what they want, but will have some guidance and focus from the AITI team.

Breaking the OCW track into several groups of a few students may be the most effective method of teaching OCW. The students can use the AITI lecture notes, supplemental textbooks, the MIT 1.00 OCW website, and the internet as resources. Other crucial resources are other OCW students and the AITI instructors. At least one AITI instructor should check in with the OCW teams near the end of class and see if they have any questions and to check their status. Also, there should be a professor assigned to help out the OCW students as well. The goal is to get the professor's familiar and involved with OCW as well so they can use it as a teaching tool. So if there is a professor willing to help, they should spend time reviewing the material with the students and answering any questions they may have.

They should still complete the assigned labs, but it may be a good idea to extend the labs or make them more challenging if most of the students in OCW are advanced and moving at a fast pace. This will help them utilize the work they were doing outside of the standard syllabus and aid them in acquiring a deeper understanding of the material.

It is important for the students to know about OCW so they can take full advantage of it. Team Ghana put up advertisements around campus in an effort to get OCW's name out there. It should also be fully explained in class, preferably near the beginning. Emphasize that it should not be any harder than the standard track. Many students are afraid since they will not be attending lecture and will have no formal

instruction that it will be a lot harder. However, OCW should be spun as a way to learn the important skill of self-learning and becoming familiar with MIT's OCW, which is a free and rich resource for learning about almost anything. OCW can also be viewed as an opportunity to learn at your pace, delve deeper in the material or learn other languages, such as JSP. Make it clear that AITI instructors will still help out and also there should be a professor helping as well.

Making sure the faculty is aware of OCW is probably even more crucial. We hope that professors and instructors will learn to use OCW to become more effective teachers. Team Ghana really focused on educating the faculty at the university about OCW. They sent out invitations to all of the departments inviting them to a presentation on OCW. Steve Carson, their OCW liaison at MIT, had a presentation on OCW that they used. They gave the lecturers a grasp of what OCW is, how it can help them, and how they can use the website. This also may be a good way to recruit faculty to help you administer the OCW portion of the course.

### **Distributing Certificates**

The certificates are an important part of the AITI program, because it gives the students an opportunity to be recognized for their participation in the program. Many students take them very seriously and are primarily in the course to receive the certificate. We recommend getting the blank certificates early, preferably before you leave for your country—it can be very difficult to have them sent through the mail. Remember, certificates are for students who successfully finish the course, so only students who satisfy your requirements should receive certificates. We would also recommend having some sort of celebration or ceremony for the students to distribute the certificates.

### **Teaching Entrepreneurship**

There is an entrepreneurship curriculum that is to be taught throughout the course as well. These lectures vary from the Java lectures, and they can be a nice break from all of the Java, or to help reset the pace of the Java curriculum when needed. Most of the entrepreneurship lectures use case studies as their main content. You may need to do research and extend the main ideas and concepts some more using examples. It is usually beneficial to try to find some examples of business ventures in the country you are teaching in, so the students feel a connection to what is going on and can relate to it.

### **Finding and Contacting Local Businessmen for Guest Lecturers**

To give the students a more local perspective, we host lectures given by local entrepreneurs and businesspeople. This allows students to learn about entrepreneurship from someone's experience instead of the theory of the lectures. The goal is to get students motivated to use their skills to help develop their countries. The teams should arrange for 2 or 3 people to speak to the students about their experiences as African entrepreneurs. Speak to the university or high school administration, as they may know people or alumni that may serve as good lecturers.

## **Entrepreneurship Competition**

We also hold an entrepreneurship competition. Students can work individually or as a group to develop a business plan. They will use a lot of the skills they learned from the entrepreneurship lectures and activities to complete this. The AITI instructors will review the business plans for feasibility, creativity, and quality. The winner of the competition will win a cash prize, with a hope that they will use the money to start up their business idea.

## **Additional Activities**

It may be fun and beneficial to participate in activities outside of the standard Java class with students. This is definitely a time to be creative. Team Ghana ran a Lego robotics course with high school students and a college information session. Team Kenya held several college information sessions, where they talked to high school students about attending college, especially in the United States. These are effective, low cost and non-time consuming activities that can further the aims of AITI. You can use your imagination to do whatever activities you would like.

## **MIT-AITI Press Information**

As part of AITI's strategy to fundraise and achieve maximum impact, we need to actively reach out to the press in each country in order to receive publicity. Therefore, it is very important that we reach out to the local press and accept any opportunities to inform people about AITI. Typically, it only takes a few phone calls to have local media cover the AITI summer programs as a human interest story. The best way to liaison with the media is to act through the schools or through contacts in the countries.

AITI also strives to promote its supporters in any press releases that it gives:

- **Learning International Network Consortium (LINC)**

LINC is a MIT-managed project that started its activities in 2003. The purpose of LINC is to leverage multimedia technologies such as the Internet, television, and radio to help facilitate world-class tertiary education. In a global economy that increasingly rewards those with skills honed for the 'knowledge industries', countries will be left behind unless current and future generations receive quality higher-level education. Investment in such an effort is required not only for social fairness and justice but also for world peace. For more information, please visit <http://linc.mit.edu>.

- **MIT OpenCourseWare**

The Massachusetts Institute of Technology is undertaking a project to make all its graduate and undergraduate available free to the public on the

web. So far, more than 900 MIT courses have been posted online, meaning that you can virtually experience an MIT education free through the web. MIT-OCW is possible through MIT faculty who choose to share their research, pedagogy, and knowledge to benefit others. You can access MIT Courses for free at <http://ocw.mit.edu>.

In order to contact AITI, the following information can be given:

Website: <http://web.mit.edu/mit-africa/www>

## **Emergency Information**

### **Scenarios**

- **Sickness / Bodily Harm/ Car Accident**

In case of a health emergency, you should immediately be admitted to the best private hospital in the city. The rest of the AITI team should alert your country's embassy/consular about your condition, MIT-AITI, your emergency family contact, MIT Police, and your insurance provider. All team members should have access to emergency contacts AT ALL TIMES. This is especially important to remember during travel.

It is very important that each participant knows her/his blood type before departing and shares this information with the team leader for safe keeping. This would be very important in case need emergency blood transfusion.

- **Crime Victim**

If you find yourself in a crime situation it is very important to remember that above all your safety is the most important thing. Therefore, if you are in a life/health threatening situation, you should surrender any valuables you have to avoid bodily harm. It is important to remember to travel in a group as much as you can while outside.

- **Safety Tips**

Stay in a group as much as you can. There is safety in numbers. Avoid staying out late especially if you are alone. Dark areas should be avoided as much as possible. If you find yourself in an unfamiliar area at night, take a taxi home.

Report any crimes to your consular/country embassy and notify the police. Police numbers for each country are included.

- **Arrests**

If someone is arrested for any reason, inform the person's consular ASAP, and notify the person's emergency family contact. It is important to avoid activities which could get you arrested. These include excessive drinking, public indecency, drugs etc. AVOID this at all costs.

- **Missing Person**

In case a member of the AITI team is missing, you must immediately contact the person's embassy/consulate, the local police, emergency contact and MIT-AITI. To avoid false calls, AITI team members should inform the group about their whereabouts and the time that they intend to return. In case you decide to sleep elsewhere, it is important to call your residence and inform them about your location.

- **Collective Responsibility**

Any incidences that arise will directly impact MIT-AITI. For that reason, we request that team members keep in mind that any decisions that they take will not only affect them personally but will also have a direct effect on the success of our program. Consequently, you must avoid taking unnecessary risks and keep safe at all times.

## **BACK AT MIT**

### **Post-Trip Interview**

When you return you will be interviewed for debriefing purposes. The AITI leadership essentially wants feedback on how your experience was and to gain some insight on what can be improved. The interviews are brief, but very important.

### **Final Report**

All teams must complete a final report upon returning from their respective countries. All team members should help to write the report, as it can be fairly lengthy. The report basically contains what you implemented in your country, how you did it, and future recommendations and changes you would like to see. These reports are crucial forms of feedback for the AITI leadership and future AITI teams. Do your best to balance out the work so you can do a good job on them.

### **Presentations**

There may be some presentations related to your summer experience that you may need to give following the program. These presentations will essentially be a recap of your experience and may be given to audiences that range from fundraisers, to AITI leadership to potential AITI applicants. All members of the team should contribute to the presentations.

### **Further Involvement**

As stated earlier in the Expectations section, we want AITI participants to remain involved in the long term. There are ample opportunities to stay involved after your summer experience is over. You can help plan events, fundraise, publicize AITI, work on the website, or do something completely new and unique. In the past many individuals from AITI have had great ideas that they wanted to see implemented and they pursued them. AITI can only grow and have an impact on African students if its members remain active and remain passionate about AITI's mission.

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