Course Summary

Crisis Informatics --- Saving lives in crises means being prepared, coordinated and fast. Information and technology are increasingly the tools people in need are turning to. As humanitarian organizations have agreed, “information is aid.” Participants in this class will learn to examine crisis situations, in continuum from personal to international crises, and evaluate and plan relevant information technology responses. The class will review personal crises such as a major accident; and recent international crisis-disaster response, such as the Syrian Refugee migration, Hurricane Sandy, and Nepal earthquake. Students will have an opportunity to have hands-on experience and with the technology tools used in disaster response, and work in teams with senior executives from international NGO's and corporations.

Course Goals and Learning Objectives:

The three objectives for this course are: (a) provide participants some background on information technology and crisis response, (b) to develop personal and community resiliency strategies and (c) to prepare for disaster response certification for future field work.

Upon completion of this class, students will be able to:
   a) Identify and recommend technologies and data relevant to the affected population's context
   b) Apply a framework for understanding the application of technologies to the scope, severity and phases of a crisis and response
   c) Develop a crisis resiliency strategy for an organization, community or individual
   d) Be prepared for deployment during a crisis response.

Rationale for the Course:

Managing and personal use of information in a crisis provides an important means for resiliency: how you bounce-back from shocks and return to healthy, productive being. IT leaders (and others) need to think about crises from an individual, organizational, community and international standpoint regardless of whether these crises are engendered by explicit natural or human-caused events. As a long-term practitioner, I can unequivocally say that organizations, especially but not only humanitarian ones, need people who are resilient in crises, can deal with ambiguous situations and can execute with agility when time is of the essence.

Audience for This Course:

Masters students seeking to develop resilient responses using information and technology in the context of a continuum of crises from the personal, to the organizational and international level. The course will be of particular interest to students interested in work with nonprofits, relief organizations, civic groups and government relief organizations, as well as those who have an interest in volunteering their time and expertise in assisting in disaster response.

Note: I intend to solicit faculty and student’s input for this class throughout the prior semester and from the roster of mentor-practitioners who will be working with student teams.
**Instructor qualifications**

Leadership in the crisis management practice and application of technologies. For example, I have 40 years of IT experience, with 38 of those years in IT-related management positions and 17 years as CIO for international organizations involved in disaster relief operations.

**Lab Support**

The class will ideally make use of phase one of the proposed “2G Lab” for simulating telecommunication contexts in many of the most vulnerable regions and countries. This lab has the need for a separate room (e.g., sub-basement location) in which the telecommunications environment can be controlled and constrained for conditions during and following a disaster. Budget is to be determined and will be technology company grant-based. Costs for phase one are expected to be below $1,000, depending on room availability.

**18. Specialization requirements: (check all that apply)**

To be negotiated with the specialization areas.

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Required</th>
<th>Counts toward Specialization</th>
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<tbody>
<tr>
<td>Archives &amp; Records Management</td>
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<td>Human Computer Interaction</td>
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<td>Information Analysis &amp; Retrieval</td>
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<td>Information Economics for Management</td>
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<td>Library &amp; Information Science</td>
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<td>Preservation of Information</td>
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<td>Social Computing</td>
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Crisis Informatics  
Proposed Syllabus  

The class will cover 5 themes across 13-14 classes  

Course themes  

1. Individual crises (episodic and recurring (e.g., stress))  
2. Local/community crises  
3. Organizational/system crises  
4. Regional/national crises  
5. International crises  

What info/technologies increase resiliency in individual crises that carry forward to international crises?  

Class Plan  

Note that a more detailed class plan is shared in Google docs and will be available to students who enroll.  

<table>
<thead>
<tr>
<th>Week</th>
<th>Class Topics</th>
<th>Readings Due</th>
<th>Assignments Due</th>
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<tbody>
<tr>
<td>1: Sept. 11</td>
<td>Introduction to the Course; Crisis immersion, Lab I</td>
<td>- Hagar, Crisis Informatics (CI), Intro, pp. 1-7</td>
<td>Background survey, by Sep. 5th plz</td>
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</tbody>
</table>
  2) Hagar, CI, Chap. 1, “The effects of continual disruption…” pp. 9-23  
  3) Hagar, CI, Chap. 2, "Law Enforcement Agency Adoption of Twitter…", pp. 25-42  
  4) Olafsson, The Crisis Leader (CL), Chap. 1, "Crisis, Chaos, Despair", pp. 1-7 | Reflection on the immersion experience (300-500 words) |
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Readings</th>
<th>Notes</th>
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</thead>
</table>
| 3) Oct. 2  | A framework for understanding the application of technology and data to crises. | - Hagar, CI, Chap. 7, "Information Systems in a Crisis" pp. 121-138  
- Happ, “Crisis and Resilience,” presentation, Feb. 2017,  
- Stair & Reynolds, Principles of Information Systems, Chapter 6, Telecommunications and Networks, pp. 260-306. | Pick two disaster scopes and two country contexts: create matrix of a primary (a-list) and backup (b-list) technology for voice and data communications |
| 5: Oct. 9  | Crisis leadership and management roles [Note that this class will be held in the large conference room, FL2, 1239 Kipke Drive] | - Olafsson, CL, Section 1, pp. 1-35  
- MacKenzie, Orbiting the Giant Hairball (Hairball), Chap. 22, "Dynamic Following," pp. 207-216. | Project teams select project; choose one or create one. Personal "Go Kit" designs are due |
| Fall Break | No class Oct. 16                                                          |                                                                                              |                                                                      |
| NetHope Summit | Class TBD Oct. 23                                                        |                                                                                              |                                                                      |
| Oct. 23-30 | **Mid-course correction with CLRT**                                      | Review of the class feedback to-date and adjust the syllabus as needed                      | Mid-course survey                                                   |
| 6: Oct. 30 | The business process of crisis assessment, response, transition and development | Hagar, CI, Chap. 6, “The Ericsson Response,” pp. 103-120                                 | Flowchart the major steps/phases of a crisis and the response to a crisis |
| 7: Nov. 6  | Crisis management research, simulation and modeling (This class will likely be at the School of Nursing, TBA) | - Meier, Digital Humanitarians (DH), Chap. 5 "Artificial Intelligence for Disaster Response," pp. 95-110  
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading Material</th>
<th>Assignment</th>
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<tr>
<td>8: Nov. 13</td>
<td>Bureaucracy and navigating the giant hairball</td>
<td>- McKenzie, <em>Hairball</em>, chapter 1-6, pp. 1-50</td>
<td>Write a story of a “hairball” situation you or someone you interview has experienced (300 words); bring personal &quot;go kits&quot; to class and be prepared to discuss if called on.</td>
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</table>
- Hagar, CI, Chap. 3, “Promoting Structured Data…Tweak the Tweet syntax” | Short paper on pros/cons of a new technology in disaster response (1000 words) |
| 10: Nov. 27| Crisis and cultural context                                           | - Hagar, CI, Chap. 8, “Community Media...” pp. 139-154  
UNHCR, "Emergency Handbook," https://emergency.unhcr.org/about | Project presentations II |
- IFRC, “The Fundamental Principles”  
- Sheri Fink, "Whose Lives Should be Saved?," NY Times, | Project teams POA II; Personal or Community Disaster Plan |
The top 3 take-aways for this course are:

1. A disaster is a disruption; the usual tools don’t apply
2. Planning and improvisation must coexist
3. Context matters for culture and technology

Drilling down a level, a dozen things I want to get across are:

1. In a disaster, you can't rely on the infrastructure
2. Murphy's Law prevails; planning for it is really hard, but necessary
3. The shift to cash programs depends on the technology backbone
4. Time compresses in a crisis, and the needs change by the hour
5. Crisis leadership first means personal grounding, dealing with frustration and high stress
6. Crisis management is much different than response and development management
7. Your technology won't match citizen technology; context matters!
8. Triage is necessary and most difficult [Tony Redmond]; what's the one most important thing?
9. Decisions must be made with incomplete data
10. Backup of backup is necessary
11. In times of rapid change, agility and improvisation are king
12. Personal preparedness is the foundation for community preparedness

Guest Lectures

The following professionals will be recruited to guest lecture in some of the classes planned:

1. Local, community emergency response planner
2. Hospital Emergency Room doctor
3. Search and Rescue team leader
4. International NGO principles and values expert
5. Crisis Leader author
6. Technology at the Margins, author

Mentors

Mentors will be assigned to teams from NetHope member CIOs and Disaster Management leads. Bi-weekly conference calls with the mentors will advise the teams on preparing their selected projects.
Projects/Team work

Project teams will all participate in mentor calls, complete a challenge project plan and present the results of the project to the class. All members of each team will also complete a personal “go kit” (solo or paired). I recommend that at least one member of each team completes the online certificate class. The whole team will present their project results plus a preparedness plan that will survive the crisis immersion simulation at the end of the course.

Required team project components:

1. Bi-weekly group-mentor calls. Each team will be paired with a NetHope member CIO or other NGO manager who will advise and challenge the team as it progresses to the final project.
2. Create a personal "go kit" (individual or paired project) in a knapsack. These are the essential items that you grab when you escape an immediate crisis. It includes voice and data access, as well as survival gear for 2 people for 3 days. Specs will be provided. Budget is $150 (in lieu of a lab fee) and students will be expected to submit a parts and price list, as well as build and demo their own kits. It will also be critical for navigating the final immersion lab.
3. Select from among four team challenge projects. Working with your team mentor, research and create a proposal and preparedness plan to be presented to a "senior management team". More details will be provided separately.
4. Complete 4 or more Red Cross or FEMA disaster management classes. These are online classes that prepare you for deployment to an international or domestic crisis response unit.
5. Preparedness plan – a plan to test survival in the "immersion" crisis1
6. Presentation of your team’s plan to a “senior management team”

Elective project components (note: these may prove useful for the final immersion lab):

1. Set up a VSAT (with time limit) and provide data access
2. Set up a WiFi repeater
3. Design improvements for the Network Relief Kit (NetHope)
4. Procure, setup and initialize Sat-phones or hand radios
5. Interview local police, fire, security for their Disaster Recovery Plan (DRP) and write up key takeaways
6. Interview NetHope CIOs for their IT DRP and write-up key takeaways
7. Update the NetHope Case studies

Grading:

I will use a point-based grading system, based on the work Professor Barry Fishman and Erin Krupka have introduced, with no curving. It is your responsibility to accumulate points based on completing the assignments and extra credit, where needed. This means you can earn an A if you accumulate 394 points or more during the semester. This also means that failure is possible—a disaster we want to plan to avoid. It’s your choice.

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1 The immersion crisis is the simulation of loss of connectivity, including power, and how to recover and problem solve in such a crisis. The proposed “2G Lab” will provide an ideal forum for this simulation.
The points-structure is divided into two sections: required and extra credit items. Items are scored from 0 to the maximum points based on the quality, completeness and viability of the assignments.

**Overview of point structure:**

<table>
<thead>
<tr>
<th>Required Items:</th>
<th>Max Points</th>
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<tbody>
<tr>
<td>Weekly one-page critiques / 10 points each (max 7, you pick which 7)</td>
<td>70</td>
</tr>
<tr>
<td>Personal and community preparedness plans and “go kit”</td>
<td>70</td>
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<tr>
<td>Completion of at least 4 online disaster classes and tests (IFRC or FEMA; a list will be provided)</td>
<td>40</td>
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<tr>
<td>Project team preparedness plans presentation and group proposal</td>
<td>80</td>
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<tr>
<td>Class attendance / 5 points each (with max 1 bye week for emergencies)</td>
<td>60</td>
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<tr>
<td>Solving the final immersion lab problem</td>
<td>80</td>
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**Total Maximum Points** 400

<table>
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<tr>
<th>Extra Credit Items:</th>
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<tbody>
<tr>
<td>Find a video clip for each class (2 points per class; max 10 points)</td>
<td>2-10</td>
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<tr>
<td>Summarize readings and present 3 take-aways and 3 questions (2 points per reading; max 10 points)</td>
<td>2-10</td>
</tr>
<tr>
<td>Set up VSAT and Wi-Fi repeater for final lab</td>
<td>40</td>
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<tr>
<td>Design improvements for the Network Relief Kit (NetHope)</td>
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<tr>
<td>Procure, setup and initialize Sat-phones or hand radios (funding/donation provided)</td>
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<tr>
<td>Interview local police, fire, or security unit for their Disaster Recovery Plan (DRP) and write up key takeaways</td>
<td>20</td>
</tr>
<tr>
<td>Interview NetHope CIOs for their IT Dept. Disaster Recovery Plan (DRP) and write-up key takeaways</td>
<td>20</td>
</tr>
<tr>
<td>Update the NetHope Case studies (from Tuck/Dartmouth, and the Stair/Reynolds text)</td>
<td>30</td>
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**Total Maximum Elective Points** 164-180

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Grade</th>
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<tbody>
<tr>
<td>425</td>
<td>Or higher</td>
<td>A+</td>
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<tr>
<td>393</td>
<td>425</td>
<td>A</td>
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<tr>
<td>379</td>
<td>392</td>
<td>A-</td>
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<td>370</td>
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<tr>
<td>262</td>
<td>281</td>
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Labs: The Immersion Experience

We will simulate a crisis at the beginning and end of the class. Students that cannot handle a noisy, dark environment may opt out (but you will miss a key feature of the class). The simulations “bookend” the class, so chaos rules initially, but what is then applied from the classes creates some order from the chaos in the end. There will be a problem to solve for each immersion experience that will require the application of technology and data.

Data and Technology, The Crisis Framework

The course will progress in four dimensions: by scope (individual, organizational, community/regional to International), by severity (mild, moderate, severe, catastrophic), context (developed, developing and least-developed countries) and by time (emergency response in the first days/weeks, the transition period, and long-term development). This will be a useful framework to think about the strategic planning, use of technologies, and data needs in crises. What applies in individual and local crises carries forward to organization and international crises.

The Personal or Community Preparedness Plan

One of the core assignments is to prepare a personal plan or community plan for ICT in disaster response. This can be an individual or group project. It should include designing a personal “go kit” and providing the off-the-shelf parts list within the constraint of an average back-pack. Plans should have sufficient detail so that another individual or group could execute it. I recommend testing it with local community police, fire or safety/security officials. Finding them and interviewing them is part of the assignment.

Academic Integrity

Unless otherwise specified in an assignment all submitted work must be your own, original work. Any excerpts, statements, or phrases from the work of others must be clearly identified as a quotation, and a proper citation provided. Any violation of the School’s policy on Academic and Professional Integrity (stated in the Master’s and Doctoral Student Handbooks) will result in serious penalties, which might range from failing an assignment, to failing a course, to being expelled from the program. Violations of academic and professional integrity will be reported to UMSI Student Affairs. Consequences impacting assignment or course grades are determined by the faculty instructor; additional sanctions may be imposed by the assistant dean for academic and student affairs.

Accommodations for Students with Disabilities

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some
aspects of this course, the assignments, the in-class activities, and the way we teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate accommodations. SSD (734-763-3000; ssd.umich.edu/) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information that you provide in as confidential a manner as possible.

**Student Mental Health and Wellbeing**

The University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at (734) 764-8312 and [https://caps.umich.edu/](https://caps.umich.edu/) during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at (734) 764-8320 and [https://www.uhs.umich.edu/mentalhealthsvcs](https://www.uhs.umich.edu/mentalhealthsvcs), or for alcohol or drug concerns, see [www.uhs.umich.edu/aodresources](http://www.uhs.umich.edu/aodresources).

For a listing of other mental health resources available on and off campus, visit: [http://umich.edu/~mhealth/](http://umich.edu/~mhealth/)
Selected Readings and Sources

[The following are the text books used in the course, with notes on expected costs.]

[The following readings are either free downloads or will be provided as PDFs]
8. J. King, et al., “911 Case Study”

[The following are the source for the eLearning courses per the syllabus]

23. A list of FEMA disaster response online independent study classes may be found here: [https://training.fema.gov/is/crslist.aspx?all=true](https://training.fema.gov/is/crslist.aspx?all=true)  [Recommended courses include 100, 139, 144, 200, 208, 247, 700, 704, 775, 800, 802, 992]
24. A list of Red Cross/Red Crescent disaster response online independent study classes may be found here: [https://ifrc.csod.com/catalog/](https://ifrc.csod.com/catalog/)  [This site requires a free registration; recommended courses are under the “Disaster Management & Disaster Risk Reduction” heading]