Computer Science Clinic
2013–2014

Student Team Handbook

Key Dates for 2013–2014

Sept. 4	Plenary meeting and Individual Team Organizational Meetings from 4:15 pm - 5:30 pm
Sept. 6 Thurs	Sponsor Liaison Orientation, First meeting of team and liaison at 11:00 am
Sept. 11	Professional Development
Sept. 18	Professional Development
Sept. 25 Tues	Project Managers' (only) Meeting with Clinic Director
Oct. 1 Mon by 10:00 am	**Draft Statement of Work due to Advisor (and cc Clinic Director)**
Oct. 2	Phase I team presentations begin in B126 (3 presentations)
Oct. 8 Mon	Faculty-approved Statement of Work due to DruAnn (1 printed copy and email electronic version and cc Clinic Director)
Oct. 9	Phase I continued (3 presentations)
Oct. 16	Phase I continued (3 presentations)
Oct. 22-23	Fall break
Oct. 30	Final Phase I (3 presentations)
Nov. 6	Phase II (3 team design review begin, location TBD)
Nov. 13	Phase II (3 team design review continues, location TBD)
Nov. 20	Phase II (3 team design review, location TBD)
Nov. 27	Final Phase II (3 team design review, location TBD)
Nov. 30 Mon by 10:00 am	**Draft of Midyear Report due to Advisor (and cc Clinic Director**
Dec. 10 Mon	Advisor approved Midyear Report is due to DruAnn (1 printed copy and emailed electronically and cc Clinic Director)
Dec. 14 Fri	Fall semester ends
Dec.17-21	Finals
Jan. 22	Spring semester begins
Jan. 22	Phase III weekly presentations begin in McAlister Hall **(mandatory to attend each week)**
Mar. 18–22	Spring break
Mar. 26 Tues	Project Managers' meeting with Clinic Director (12:00–1:00 lunch provided)
Apr. 1 Mon by 10:00 am	**Draft of poster design is due to Advisor (and cc Clinic Director)**
By Apr. 9 Tues at 8:00 pm	Teams complete the draft of their report and email it to the other teams in their cohort. Cohort A: 3 teams ? Cohort B: 3 teams ? Cohort C: 3 teams ? Cohort D: 3 teams ?

Apr. 9 Tues	Teams complete he draft of their report and email it to the other teams in their cohort. The PM for the team coordinates the assignment of reports to individuals
By Apr. 11 Thurs at 4:00 pm	Each student has read his or her assigned cohort's final report and is ready to meet at 4:00 pm to give feedback
Apr. 11 Thurs at 4:15 pm	Everyone meets on Sprague 2nd floor
Apr. 11 from 5:15–5:45 pm	Review teams present their findings and email their completed rubrics to the reviewed team
Apr. 12 Fri	**Software feature freeze**
Apr. 17 Wed	Advisor approved final Poster is due to Tim Buchheim, System Administrator and email it electronically to DruAnn
Apr. 17 Wed	**Draft of Final Report is due to Advisor (cc Clinic Director)**
Apr. 19 Fri	**Code freeze**
Apr. 23 Mon	**Draft of Projects Day presentation is due to Advisor (and cc Clinic Director)**
Apr. 30 Tues	Phase III (last of the clinic presentations)
By May 7 Tues	by 10:00 am - **PROJECTS DAY.** Poster must be up in the Platt Living/Green Rooms
May 7 at 6:15 pm	Dinner and entertainment in the LAC (involving all Clinic teams, Liaisons and Advisors)
May 10 Fri by 4:00 pm	Printed Advisor approved Final Report copies are due to DruAnn by 4:00 pm (only use special paper that will be provided for printing) and cc Clinic Director
May 4 Fri by 4:00 pm	Completed checklist is filed with DruAnn. This includes cleanup of your 2nd floor work area
End of May	Spiral bound final report and other deliverables are mailed to the Sponsor
August	Hardbound Final Report is mailed to Sponsor and Students

i

Contents

Preface

This handbook is intended to help you participate effectively in the Computer Science Clinic program, and to understand what is expected of you in the course of that participation.

The construction of this document is the result of accumulated efforts of James Stepanek '94, Joshua Hodas, Robert Keller, and Julius Elinson '13. We also occasionally borrowed aspects from the Mathematics and Engineering Clinics' handbooks. In a given year, some policies or procedures might change and those changes are not always reflected in the latest edition of the Handbook, as much as we might wish. Please rely upon verbal contact with the Clinic Director or your Faculty Advisor as the final word.

Chapter 1

Introduction to Computer Science Clinic

This introduction provides an overview of the Computer Science Clinic program at Harvey Mudd College. It includes both a description of the Clinic program and a discussion of the organization of the typical Clinic project.

1   What is Clinic?

The HMC Clinic Program brings together sponsors who have problems to be solved with student teams who have the skills to solve them. The concept for the Clinic Program originated in the HMC Engineering department in 1963 as a result of the efforts of Professors Jack Alford and Mack Gilkeson, who were interested in channeling HMC student initiative, drive, and intelligence into projects of a "real-world" nature. To quote Jack Alford:

> "I gained the idea that engineering was like dancing; you don't learn it in a darkened lecture hall watching slides: you learn it by getting out on the dance floor and having your toes stepped on."

The name "Clinic" derives from HMC's conviction that the solution was to give students clinical experience similar to that which medical students receive as part of their training: solving real-world problems in a controlled environment.

To that end, a Clinic project is a year-long project sponsored by a company or other organization. It is a graded course in which students work together as a team to solve a particular problem or set of related problems. Clinic projects often tackle unsolved difficult problems, including some for which no prior guaranteed solution exists. At the same time, Clinic projects tend to reflect their origins in industry, research laboratories, or public service, giving those involved with the program valuable real-world technical and managerial experience. In addition to learning more about their technical field, Clinic students learn a great deal about the professional environment and the challenges of working with a group on a long-term team project. As part of a team, students have the opportunity to develop valuable leadership skills not cultivated in traditional course-work. They also get the chance to improve written and oral communication skills by delivering reports and presentations of the team's progress.

In 1973, following the model set by the Engineering Department, the Mathematics Department started its own program to emphasize mathematical modeling and analytic tools for applied mathematics problems. The Computer Science Clinic was created in 1993, with an emphasis on problems related to computational and information-based systems. Clinic became a graduation requirement for the Computer Science major in 1996. The Physics Clinic was also started in 1996. In 2006 the first Global Clinic was started, with the vision of Professor Tony Bright.

2   What is the Computer Science Clinic?

The B.S. degree in Computer Science at Harvey Mudd College requires that students participate in a year-long Clinic project. Typically, students fulfill this requirement during their senior year, though a number of well-qualified students (typically those also considering a senior research project) who have completed the prerequisite coursework participate during their junior year. On occasion students from other HMC majors, and Computer Science majors from the other Claremont Colleges, participate in the program.

As in the Clinic programs of the other departments, sponsors of Computer Science Clinic projects pay the college a substantial fee to participate in the program.[1] In return, the department allocates faculty, students, equipment, and other resources to the sponsored project. The number and type of projects for a given year depends largely upon the number of stu-

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[1]While the vast majority of projects are sponsored by commercial corporations, who pay a fee to participate, the Clinic Director also endeavors to identify worthwhile projects to be completed on a *pro bono* basis for not-for-profit organizations.

dents participating and the availability of sponsors. Teams generally consist of three to five students, with four being the most common team size.

As a department rooted on the systems, theory, and software side of computer science, the Computer Science Department generally recruits Clinic projects in areas such as software development, computer networking, parallel computation, interface design, algorithms, programming language and development tools, graphics, database systems, artificial intelligence, robotics, and a variety of cutting-edge and exploratory techniques.

One of the reasons the computer science faculty are so enthusiastic about Clinic is that the projects often expose students to the internal structure of large commercial-quality systems. In contrast to, for example, mechanical engineers, who have the luxury of being able to disassemble day-to-day industrial artifacts and examine their construction, computer science students less often have such an opportunity with large software systems of significance (the recent trend towards open-source software notwithstanding). Clinic provides just such opportunities.

During the spring and summer before the project begins, the Clinic Director meets with prospective sponsors to negotiate projects for the following academic year. This negotiation process can often be a lengthy one, particularly with new sponsors. First, it is necessary to identify a project that fits the Clinic timeline, spread as it is over the academic year. More importantly, it is necessary to find a project that matches both the goals of the sponsor and the educational goals of the college. The project must have a reasonable chance of success, but must also pose significant challenges to the students. While the director reminds the sponsor that this is still primarily an academic enterprise for the benefit of the students (and not contract work for hire), at the same time the project must be of benefit to the sponsor. We are less inclined to accept a project merely being offered as a donation to the college out of a sense of "corporate citizenry".

Late in the summer the descriptions of the projects are finalized and faculty advisors are assigned to each project. At the same time, students enrolled in the Clinic program receive brief descriptions of each of the projects to be completed that year. Students express their relative interest in the various projects. Based in part on that input, the faculty then match each student to a particular Clinic project by their interests and skills and the overall needs of the program.

3 Educational Goals

While working to the client's specification is a key aspect of the Clinic program, the success of a project is not measured only by the success of the technical products of the project from the sponsor's point of view. Clinic is,

first and foremost, an educational endeavor. The educational goals of the Computer Science Clinic are summarized as:

- Gain experience with the nature, demands, and ramifications of real-world problems

- Practice design decisions and trade-offs

- Manage complexity, difficulty, and time constraints

- Control the project via scheduling and resource budgeting

- Develop a good sponsor relationship, including dealing with the client's changes should the need arise

- Develop team leadership/membership skills:

    - Division of work and delegation of tasks and authority
    - Utilization of a variety of talents and skills
    - Meeting responsibility and accountability expectations
    - Personnel evaluation and criticism
    - Resolution of personnel conflicts

- Increase understanding of design and development processes:

    - Proposal, negotiation, contract, execution, evaluation
    - Background research, preliminary design, revision
    - Detailed design, prototyping
    - Field tests, debugging
    - Final release, acceptance test
    - Code reuse
    - Documentation and reporting

- Increase ability to apply theoretical course material:

    - Recognize applications and limitations
    - Differentiate between reality vs. model
    - Balance analysis, design, experimentation, implementation, and optimization

4 Intellectual Property, Confidentiality, and Clinic

While education generally strives for unlimited free and open discourse, commercial corporations often focus on the protection of intellectual property, particularly in the early stages of an endeavor. This dichotomy creates a challenge for a program such as Clinic. The educational goals of the program must be balanced carefully with the realities of interacting with commercial concerns of sponsors.

In order to draw and to retain the interest of sponsors, the program and sponsor mutually agree that all intellectual property developed in the course of a project becomes the property of the sponsoring organization. We see this as a fair exchange for the effort the sponsors make on behalf of the program, the fee they pay, and the confidence they place in our students. In most cases the assignment of intellectual property rights is accomplished by the Letter of Agreement (LOU) between the sponsor and the Clinic program. In some cases the sponsor may request that the team members individually sign a specific personal assignment of these rights.

Of course, not all projects have a commercial product as an ultimate goal. Sometimes, even with commercial sponsors, the projects are intent on producing software to be put into the public domain.

The Clinic Director in general tries to identify projects that place the fewest limitations on the ability of students to discuss their undertaking. Nevertheless we recognize that most sponsors may have additional concerns, and may decide that their projects are sufficiently interesting to warrant requiring that team members sign non-disclosure agreements (NDAs) safeguarding the sponsor's interests.

There is a limit to the degree of confidentiality to which the Director will agree. For example, due to practical implications, we will not accept a project that requires any sort of security clearance. Similarly, because of the important role of the on-campus presentations in the educational goals of the program, we will not accept a project that severely limits the ability of a team to make those presentations. (Though restrictions on presenting a few key details may be deemed acceptable.)

Note that, in the absence of non-disclosure agreements, the program does nevertheless make a promise to the sponsor to protect internal documents and materials to a reasonable extent. To that end, we expect the project team to act responsibly in handling such documentation and also require all Clinic students to sign a Student Participant Confidentiality Acknowledgement form (See Appendix B).

5   Organization of a Clinic Project

The success of the several Clinic programs of Harvey Mudd College involves a combined effort across many levels. This includes students, faculty, staff, trustees, and sponsors. Several important elements of this effort play particularly crucial roles in a project's success. At the most basic level, the students do the work; the faculty advises, coaches, and evaluates; the sponsor liaison informs, guides, and accepts or rejects results; the staff provide support; the Clinic Advisory Committee, chartered by the trustees, provides formal evaluation of results and additional steering.

5.1   Faculty Advisor

You should think of your faculty advisor as the main source of guidance in managing a successful project. Working closely with the student project manager, the faculty advisor monitors the team's progress and directs the team in important decisions. Your faculty advisor may initiate communication between your team and your liaison. He or she is expected to and keep the Clinic Director informed of your team's progress. The faculty advisor also acts as a source of general CS technical knowledge vital to the project but possibly unfamiliar to the team members. Finally, the faculty advisor is responsible for assigning your grade for each semester of the project.

5.2   Sponsor Liaison

The sponsor liaison acts as a representative of the interests of the sponsor of the Clinic project. As part of this role, your liaison is the main source of communication between your team and its sponsor. The liaison provides the team with much of the information and technical background necessary to define and complete the project. The liaison can also help the team by giving its members a better feel for the project's goals and context. Typically the liaison will be a member of the division of the sponsoring organization that is most closely concerned with the outcome of the project and will therefore have a vested interest in the success of the project. Often the liaison may be the person who promoted the idea of the project within the organization in the first place. Frequent contact with the liaison can protect the Clinic team from pursuing wrong or unfruitful directions. A good working relationship with the sponsor liaison is crucial to a successful project outcome.

Typically, a team has a direct contact with the liaison at least once a week. Unless the sponsor is very close to Claremont, most weeks this contact will be in the form of a conference phone call or a teleconference. Occasionally (typically, once or twice a semester) the liaison will come to campus

for a face-to-face meeting. The team will also usually visit the sponsor site once or twice a semester. Regular email contact is also helpful. (Each team has two email aliases, one of which includes both the team and the liaison.)

The future success of the Clinic program depends in part upon making an effort to satisfy the sponsor. Thus maintaining an open, mutually-beneficial relationship with the sponsor through the liaison is crucial for success. In return for his help, you have certain responsibilities toward your liaison. It is vitally important that you recognize the significance of the liaison's contribution of time to the project. In many cases the allocation of the liaison's time to the project can be a more important issue for the sponsor than the actual Clinic fee. Make sure that you are on time (or, better yet, early) for all liaison contacts. Come prepared to bring the liaison up to date on recent progress, and to ask questions. You want the liaison to leave each contact with a sense of every member of the team being active, interested, and involved in the project.

5.3 Project Manager

Each Clinic team has a student project manager responsible for directing the team in pursuit of the goals of the project. Much like a project manager found in the industrial arena, the project manager forges many of the relationships necessary to make the project come together. This means the manager must maintain close contact with all the participants in the project, from the sponsor liaison, to the faculty advisor, to the other team members. The project manager must also coordinate tasks, attend all meetings, monitor schedules and progress reports, and generally ensure that the project moves ahead to completion. However, do not wait for the project manager to direct you to begin work; success of the project requires a proactive work-seeking attitude from each member. For more information on the duties of a manager see "Project Manager's Responsibilities" in Chapter 3.

When we survey you about your project preferences at the beginning of the year, we will also ask about your interest in acting as a project manager. You should understand that the manager need not be the strongest member of the team technically. The ability to carry out organizational work is far more important. Being project manager carries significant additional responsibilities in the organizational domain. These additional demands are typically offset by a reduced technical load.

The project manager will be designated by the Clinic Director in consultation with the faculty. Once an initial designation is made, the team may, with the consent of the faculty advisor, vote to change the assignment. The assignment of manager can, in principle, change during the year. In fact, some advisors prefer to rotate the position. This represents the desire to

share the experience, as much as it might indicate the need for a change based on progress.

5.4   Team Members in General

The team members provide the most important resources available for completing the project. The exact nature of each member's responsibilities will vary greatly depending on the project and their individual interests and experience. Whatever their relative strengths though, every team member should be involved in the technical work of the project, as well as the written and oral presentations. While the exact responsibilities of each member will vary, the project demands a certain set of requirements of all team members (see "Course Requirements" below). Every member of the team should have a clear vision of the project's directions and feel that he or she is making an important contribution to the project. Discuss with your advisor if you do not sense this.

It is important to recognize that an unhappy team member can be enormously damaging to the progress of the project. Therefore it is vital for everyone involved in the project to pay attention to the feelings and needs of the other players. Occasionally, however, some problems or tension may arise. Chapter 12 contains some discussion of how to deal with personality conflicts and other issues that may occur in the conduct of a project.

6   Course Requirements

While the goals of the project will depend largely upon the specific wishes of the sponsor of the Clinic project, certain course requirements will generally hold regardless of the project. Generally, all the team members are expected to satisfy the following basic requirements:

- Attend regular team meetings and meetings with the faculty advisor,

- Actively participate in any meetings or other contacts with the sponsor liaison,

- Contribute to the technical work of the team, at the rate of about 10 hours per week,

- Meet deadlines set by the project manager and faculty advisor,

- Attend and participate in all of the oral presentations held Tuesday at 11 A.M.,

- Contribute, in a timely fashion, to the written statement of work, mid-year report, final report, and final deliverables, and

- Properly document Clinic team activities, including helping maintain the project Trac site and wiki (or comparable project management tool).

As part of this documentation, each student is provided with an official notebook for use during the course of the project. You should use this notebook for all project related writing. Use it to take notes at meetings, record thoughts about the project, etc. Your faculty advisor may set other specific recording requirements as well, such as recording actual time spent on the project. Your advisor may collect lab books at various points in the year to help assess the team and individual members. Further details on the use of the lab books are found in Chapter **??**.

In addition, you are required, as a team, to maintain a project wiki detailing the progress of you project. The details of the requirements for this wiki are found in Chapter **6**. It is permissible to record information directly to the wiki, bypassing notebooks, if done carefully and thoroughly.

If you cannot attend a given team meeting or Tuesday presentation, you must inform your project manager in advance. All of these gatherings rely on participation for their success, and attendance is not optional.

In terms of total time commitment, we expect each team member to invest an average of ten or more hours a week on Clinic. As with any course, there will be periods of more or less intense work. However, because other members of the team are relying on your output, it is more important to maintain a steady level of effort than in other courses.

6.1 Grading

The faculty advisor takes responsibility for assigning grades for the Clinic course. Among the criteria used in assigning grades are:

- Quality and timeliness of accomplished work

- Communication of ideas

- Attendance at team meetings, presentations, and other activities

- Overall impact on the project.

Many of these criteria differ from those of a typical academic course. Most importantly, many will unavoidably reflect not just your own work but the work of others on the team. Generally not all the team members will receive the same grade. Your own contributions will be noted and impact your own grade. Unlike most courses, a Clinic team maintains close contact with the advisor throughout the year, giving the faculty advisor a more complete picture of performance upon which to base a grade. The CS

faculty have agreed as a group to require the assignment of grades for each semester, rather then a single grade for the entire year.

7   Other Clinic Personnel

There are a variety of support personnel and other people involved in the Clinic Program behind the scenes. The roles of a few are detailed below. Contact information is given in the directory in Appendix D.

7.1   Clinic Director

Professor Geoff Kuenning is the Director of the Computer Science Clinic Program. The Director's responsibilities include soliciting and developing projects from potential sponsors, overseeing the formation of project teams, coordinating the purchase of major Clinic-related equipment, maintaining communications with sponsors over the course of the year, coordinating activities with the other HMC Clinic programs, and generally making sure things run smoothly for the Computer Science Clinic program.

7.2   Clinic Coordinator

DruAnn Thomas is the Computer Science Clinic Coordinator. (She also holds a similar position in the Mathematics and Global Clinics.) Her responsibilities include a variety of day-to-day administrative tasks including management of the program budgets, preparing written communications with the sponsors, etc. All requests for purchases and reimbursements, as discussed below, should (once approved by the Director or faculty advisor) be handled through DruAnn. She can also make any Clinic-related travel arrangements for the team. Finally, you may also call upon her for help with major photocopying tasks, provided you allow at least twenty-four hours for their completion.

7.3   System Manager and System Staff

Individual teams maintain the computers used for the project, with the help of the Computer Science Department system support staff. The System Administrator, Tim Buchheim '01, x73485 oversees the student staff. The staff will take care of tasks such as backups, which will be performed on a regular basis. They can also be called upon to install software on the department server, as needed for your team's use. The best way to request a specific task is to use the request system at http://www.cs.hmc.edu/request. Also please cc the Clinic Director, Professor Kuenning on your requests.

7.4 Engineering Clinic Support Staff

Because the various departments coordinate a variety of events, including Tuesday presentations during the spring, Orientation Day, Projects Day, etc., it may be necessary for you to call upon the support staff of the Engineering Clinic at those times. Professor Erik Spjut is Engineering Clinic Director; Lorena Gongzales is Administrative Assistant.

7.5 Clinic Advisory Committee

The Clinic Advisory Committee (CAC) is appointed by the trustees of the college to provide oversight and advice on the administration of the Clinic program. It is chaired by a member of the Board of Trustees and consists of the Dean of Faculty, the Directors of the five Clinic programs, and sixteen external advisors from industry. Many of these advisors work for companies with a history of sponsorship and other involvement in the Clinic program. Many of the advisors are past project liaisons themselves. The committee's charter is to evaluate projects and offer advice to the students, faculty, and staff for the purpose of sustaining and improving the Clinic programs.

The CAC meets three times a year. Typically there is one meeting in the fall, two in the spring, and one during the summer. While much of the committee's work involves higher-level questions of the program's administration and execution, the committee also involves itself, to some extent, at the level of following the progress of the individual projects. To that end, the meetings that occur during the academic year take place on Tuesday, and the CAC members attend Clinic presentations on those days. The discussion at those meetings begins with an analysis and critique of the projects presented.

Chapter 2

Calendar of Clinic Events and Milestones

In the course of the year there are a number of events and deadlines that frame your work and partially determine your project work schedule. In this section we present these milestones in roughly chronological order.

1 Project Description Posting and Clinic Assignments

During the summer, the Clinic Director will post brief descriptions of the Clinic projects that have been selected for the upcoming year. The exact date of this event varies, since posting the information requires that all projects and their descriptions be agreed upon with the sponsors. You will receive an email pointing you to the descriptions, and referencing a survey form that you can use to indicate your preferences. This form will also request other information necessary for assigning students to projects, such as your willingness to be a team leader, your citizenship, any reservations regarding defense projects, etc. It is important that you fill this form out completely and return it by the deadline.

In mid-summer, the CS and Math Clinic directors will meet and assign joint majors to one of the two departmental Clinic programs. Just before school starts, the CS faculty will meet to assign students and advisors to the Clinic projects. These assignments are based on the students' preferences and skills, the projects' needs, and various other factors. Once assigned, it would be appropriate for the project manager to send an introductory

message to the liaison and team.

2   Student Orientation

The Clinic year will begin with a brief plenary session, followed by team organizational meetings at 11 a.m. on the first Tuesday of the fall semester. If possible, the teams should conduct an introductory liaison conference call during this time. Contact DruAnn Thomas for room assignments and other information.

3   Liaison Orientation / Project Launch Day

As the first major event on the Clinic calendar, Orientation Day gives all those involved with the Clinic program a chance to start off the year on the right foot. All the sponsor liaisons are asked to attend the Orientation Day activities. The day begins around 10:00 A.M. with a presentation by the Clinic Director for the liaisons. This talk is aimed at explaining the Clinic program and the liaison's role to the new liaisons.

At 11 A.M., most teams meet with their faculty advisor and a face-to-face with their liaison for the first time. This is an opportunity for the liaison to flesh out the project description beyond the short abstract submitted at the beginning of the term. This meeting will likely be a working lunch meeting. Because some advisors may be assigned to more than one project, it is sometimes not possible for all teams to meet at 11 A.M. In that case, additional team meetings are held at a convenient time in the afternoon, typically at 1 P.M.

It is very important that you make a good impression with your sponsor during first meetings. When you arrive, you should have already studied all the project materials that have been provided to you. It will be very helpful to have a written list of questions about the project produced during a prior team meeting.

4   Sponsor-Site Visit

In the first month of the project, we encourage each team to make plans with their sponsor to visit the sponsor's site. Visiting the sponsor's site provides additional insight into the context of the project. The team might then see how the project fits into the other work going on there, as well as meet other employees with whom it may interact in the course of the project. Because these visits typically last at least half a day, they also provide the opportunity for longer, more in-depth meetings to follow up on the

Orientation Day meeting. We have found that these visits can be helpful in quick-starting the team's work on the project. If there is a point person for planning the visit, it is worth asking what is appropriate attire for the company. Note that even if it is casual, you should keep it professional and presentable. If you don't know what is the norm, assume business attire, which means coat and tie for the men, business suit or dressy blouse with skirt or pants for the women.

It is good to let your sponsor know ahead of time of any things in particular you'd like to accomplish during the visit. Also for project managers, you should ask if the sponsor(s) will want to lead any meetings or expect you to. Here is a list of things you might want to consider covering while on-site.

- Ask for the exact specifications of the machine(s) that your software will be expected to run on. This includes operating system, window manager, hardware, type/number of displays(s), versions of any existing software or libraries used. If it is very specific, perhaps ask if you can borrow a machine for testing during the project.

- Ask how the software you will be developing will be distributed, if at all. The sponsor may be able to show you how internal software is usually released.

- Ask to meet any targeted users of the software or people who contributed to the idea.

- If applicable and time permitting, ask just to observe the targeted users doing their normal work. The software you develop should suit the workflow that the user's are accustomed to.

- If you meet a number of people who are not specifically liaisons but who might be helpful to the project, ask for their contact information and the best way to reach them.

5 Statement of Work

Before you and your team actually begin implementation work on the project, you will submit a Statement of Work (SoW) to your sponsor. This important document makes explicit the exact goals and scope of the project and clarifies the expectations between the sponsor and the project team. It represents a fleshing-out of your understanding of the sponsor's original project description, and your plan of attack for the solution. It is typically five pages long.

For more information on the format and content of the Statement of Work, see Chapter 4.

6   Project Managers' Meetings

Project managers' meetings provide a forum for the managers to get together and discuss common problems particularly pertinent to their position, and to discuss them with the Clinic Director. It is also a time for the Director to discuss his concerns with the managers, based on feedback from the faculty advisors and liaisons.

7   Tuesday Presentations, Phase I & II

Every Tuesday from 11-11:50 A.M. you are required to meet in a plenary session with all clinic participants. During the fall term, your team will make two presentations during this session. More details on the presentations are given in Chapter 5.

Prior to the first of these presentations, the Clinic Director or a designated faculty member or guest will review aspects of project management and software design that might be helpful during the course of the term.

The following is an outline of the things that take place during for the Fall Tuesday sessions, roughly in the order that they will occur. These should be supplemented by additional team meetings that you schedule.

Administrative Set-up Each team will hold an organizational meeting and, if time permits and deemed worthwhile, conduct a brief liaison conference call. Clearly you would have to coordinate such with your liaisons beforehand. This meeting would be a good time to set up a weekly schedule for the semester, exchange contact information and discuss team expectations.

Liaison Orientation The liaisons will attend an orientation session on campus. In addition to getting a fact-to-face project explanation from the liaison, as many remaining administrative details as possible should be worked out. Generally speaking, prepare and ask as many questions as you can.

Team Management Review project management and team organization. Things that should be discussed include: who is in charge of what, how will work be distributed, how meetings will run, etc. Keep the plans simple, however, since projects, and the associated responsibilities, evolve through time.

Development Practices Review software development models. Things that should be discussed include: version control, testing practices, coding standards, etc. Try to set clear and realistic goals; it will be a waste of time if you agree on elaborate development practices that no one ends up using.

Phase I Presentations Teams present their problem statements and plans of their approach for the rest of year.

Phase II Presentations Teams present design review, progress reports, obstacles and risks to a few other teams in a rotation. This is an opportunity to both demonstrate and reflect on progress made so far, as well as solicit input and ideas from other teams.

8   Mid-Year Update

The Mid-Year Update is relatively new to the Clinic project. Previously, a full report was expected that detailed the progress to date and future plans. However, this would cause all other work, development especially, to come to a halt. The Update is intended to allow teams to keep their momentum right up until Winter break. The document must be between one and three pages—no more, no less. Although this may make it sound easier, it can be a challenge to write concisely and clearly, which is a good skill to practice.

For more information on the form and content of the Mid-Year Update, see Chapter 4. A possible alternative to this document entirely is a substantial deliverable that you work out with your sponsor and the faculty advisor.

9   Tuesday Presentations, Phase III

Roughly a week into the second semester, Phase III presentations begin. These talks are held jointly with all the other Clinic programs. Talks are held in Galileo McAlister on Tuesdays at 11 A.M. During this phase, three teams present each day, with talks limited to 15 minutes plus a few minutes for questions.

The Phase III presentations also may serve as a practice run for the presentation given on Projects Day. Compared to the Phase I and II presentations, they are more formal, designed for and presented to a broader audience, and with a higher level of polish. More information on the expected form and content for these presentations can be found in Chapter 5.

It should be noted that it is common for prospective sponsors of future projects to be invited to attend Tuesday presentations to get a sense of the

depth of the Clinic programs. Thus the quality of these presentations can have a major impact on the future of the program.

Generally a specially-catered lunch with your team and liaisons is held in the Green Room immediately following the Phase III Clinic presentations at 12:00 (noon). Should you not be able to join your team for lunch or have any special dietary needs please contact DruAnn at druann_thomas@hmc.edu.

10   Feature and Code Freeze

Because there are many deadlines close together at the end of the year, it is vital to control work effort carefully in those last few weeks. To that end, the department has instituted a feature freeze three weeks before Projects Day and a code freeze one week after that. This will allow time for final testing and transition of code to the sponsor. Also during this period, you will need to focus on your other deliverables, complete your final report, construct your presentation, and complete your poster.

11   Projects Day and Final Presentation

The Tuesday after the last week of classes in the spring semester is Projects Day, on which Clinic teams from all departments make their final oral presentation. In addition to all of the college faculty and students, all the project liaisons and a large number of visitors from industry and academics are invited to attend. These include representatives of past sponsors and sponsors being recruited for future projects. Your liaison will usually attend, and may well bring other people from the sponsoring organization to show them what you have accomplished.

Details on the structure of Projects Day are found in Chapter 11.

The Computer Science Clinic holds its end-of-year banquet following the poster session and reception. Details will be provided in late April.

You should consider the Projects Day presentation one of the most important of the year. Other presentations during the year, particularly your Phase III Tuesday presentation, should leave you well prepared for it. You should endeavor to make the presentation as professional as possible. You are expected to prepare the talk well ahead, present it to your faculty advisor a week before Projects Day, and work with your advisor on refining and rehearsing the talk in the days leading up to Projects Day.

The basic format of the Projects Day presentation is the same as that of the Phase III Tuesday presentations, described in Chapter 5, except that you

have about 25 minutes for presentation and questions combined. The same presentation is made three times during the day.

12   Projects Day Poster

Projects Day begins and ends with a poster session at which attendees may browse the posters of all the Clinic teams. The goal of the first session is to help attendees decide which team's presentations they are actually interested in attending, since they are only able to attend six talks. The morning and afternoon poster sessions provide them with an opportunity to learn more about some of the projects.

To simplify the creation of the poster and to provide a uniform, professional appearance, the Computer Science Clinic has standardized on one basic poster design, which is implemented as a single large-format Keynote slide. Keynote, rather than PowerPoint, is used to provide a better appearance of the result with our printer. Note that Keynote runs only on Macs. The template for this design can be found on the web page https://www.cs.hmc.edu/twiki/bin/view/QREF/PrintingClinicPosters. Details of the poster format can be found in Chapter 7.

Note that you are expected to have a draft of your poster for the poster session ready for your advisor four weeks in advance of Projects Day. The final poster design must be submitted to the System Administrator in electronic form to allow time for it to be printed.

13   Final Report

The Final Report summarizes the results of your year-long effort on the project. This report should include a recounting of the problem, the conduct of your effort (including how your actual performance related to your original schedule), a description of the results, and a detailed discussion of recommendations to the client.

For more information on the form and content of the Final Report, see Chapter 4.

14   Deliverables CD-ROM

In addition to the final report, each team prepares the contents of a CD-ROM as their primary deliverable. This will be of the form of a directory on Knuth. This directory should contain all of the code developed for the project (including all source code and, where practical, executables), electronic copies of all of the project reports and the project poster. The System

Administrator will produce the physical CD-ROMs or equivalent from the content there.

For more information on the form and content of the deliverables CD, see Chapter 8.

15   Other Reports and Presentations

During the course of the project, your liaison may request that your team prepare interim presentations or reports (for example, a presentation to be given to others at the sponsoring organization during a site visit). Such reports and presentations should be given a great deal of attention, as not only the team, but the liaison as well, may be judged on the quality of these items.

Chapter 3

Project Management

Managing a year-long team-based project can be a difficult task, especially for those who, like many Clinic participants, have little or no technical management experience. For this reason, the task of managing a Clinic project provides both a serious challenge and a valuable learning opportunity. This section attempts to give those about to embark on the difficult task of managing a Clinic project some tools which will hopefully make the challenge a little less daunting.

While some of this section is directed at the project managers, most of it is relevant to, and should be read by, all of the members of the project team.

1   Project Manager's Responsibilities

Because the task of keeping things flowing in a Clinic project falls most heavily upon the shoulders of the project manager, he or she incurs some additional responsibilities beyond those of the rest of the team members. Essentially, this amounts to managing the resources available to the team (most importantly, the team's own time and labor) in a way that best suits the problem at hand, while at the same time making sure that others with a vested interest in the project, namely the sponsor and the faculty advisor, fully understand the intentions and progress of the team.

The project manager's responsibilities include the following:

- Maintaining an overall schedule for the project

- Working with advisor and team to assign tasks to team members

based on their skills, the project's needs, and the development schedule

- Monitoring individual team members' progress and motivating them to complete their assigned tasks

- Coordinating project activities (meetings, presentations, site visits, etc.)

- Maintaining communication between the team and the sponsor liaison

- Maintaining communication between the team and the faculty advisor

- Representing the team's interests at Clinic related activities (project manager's meetings, presentations to the public, etc.)

- Dealing with any conflicts among team members

As discussed earlier, these additional organizational duties may be offset by a reduced technical load.

2   Scheduling and Time Budgeting

Each team must maintain and follow a schedule outlining the required steps for the completion of the project. It is vitally important for each team member to completely understand at all times exactly what work he or she is to be doing and when it is to be completed. The Trac (or a comparable project management) site can be helpful in this regard. The schedule should be as specific as possible, not only including the dates of expected completion of project goals, but also exactly which team members are working on what tasks at any given point. In addition to being essential for the team's success, a detailed schedule also makes monitoring and reporting the team's progress much easier.

The team should compose a preliminary schedule for inclusion in the statement of work. While it is important for you to try to stick to this schedule, most projects will require some flexibility in scheduling. For example, the schedule may adjust over time as a result of unforeseen difficulties or early completions. In general, the schedule will get more specific as time goes on and deadlines get closer. As you begin to understand exactly the tasks and your role in completing them, you will be able to flesh out the specifics of the schedule.

The core schedule is in the form of milestones on the Trac site outlining the principal tasks and subtasks to be completed, their interdependence,

and the deadline for each one's completion. You should also prepare a time budget.

Maintaining a time budget and timeline are integral to the Clinic educational experience, which is focused on recognizing the complexities of real-world projects. Therefore it is imperative that you reflect on the budget's accuracy to date in the mid-year update and final report, comparing the original theory to your actual performance. While it is not necessary for you to fill out time sheets, you should keep track of time spent on each task, for use in preparing these comparisons. An up-to-date project schedule and list of task assignments should always be available on the project's Trac site.

3 Communication

Perhaps the most important task in managing a Clinic project is maintaining effective lines of communication between all those involved in the Clinic project, including team members, faculty advisor, sponsor liaison, and the Clinic offices. Several guidelines will greatly increase the quality and value of communication.

- Always try to keep the overall goals of the project in mind.

- Listen carefully to what others are saying.

- Do not interrupt each other when talking. Really try to be mindful of this because we often do this without noticing.

- Use your notebook to take notes, and keep written records of important material.

- Formulate ideas in an explicit, easy-to-understand, manner.

- Ask questions and paraphrase to clarify ideas.

- Don't be afraid to express your ideas or indicate they might be tentative.

- Anticipate the concerns and desires of others.

- Don't take criticism personally. Likewise, make criticism constructive and impersonal.

Most likely, you will utilize a variety of forms of communication to accomplish your project goals. These include personal contacts, meetings, written records, reports, telephone/fax, and electronic mail. Each of these forms has its own advantages and disadvantages to consider.

4   Meetings

You and your team will schedule several types of meetings during the course of the project. Meetings are one very important means of communication and can also be used to actually get some work done. In all cases, so as not to waste other people's time, it is important for you to come to the team meeting prepared and on time.

At every meeting, the team should go once around the table and make sure that every team member can confirm the tasks on which he or she will be working up until the next meeting. Any new assignments should be noted in the formof tickets on the Trac site.

4.1   Weekly Meetings with the Faculty Advisor

All team members should meet together weekly with the faculty advisor to report progress, ask questions, and plan for the future. The faculty advisor can help the team keep on a course for success, but this requires maintaining an open and honest line of communication. A productive weekly meeting can make this possible.

4.2   Regular Team Meetings

You and your team should also plan to meet a minimum of at least once a week on your own, outside of the liaison conference calls. During this meeting, the team can interact to assess progress, assign tasks, and set goals. As part of his or her responsibility, the project manager should run the team meetings with these activities in mind.

Most teams hold long team meetings in which the team members actually work together on the project. This has benefits for keeping people motivated and informed about the project. Consider trying pair programming or other types of collaboration to get the best use the team's time.

Be mindful to schedule meetings only when the team will have had a chance to work since the last meeting and there will be something to discuss. Meetings are important and necessary but do take away from the team's time to work on concrete deliverables.

Team meetings should have agendas prepared by the project manager generally ahead of time.

4.3   Meetings with the Sponsor Liaison

Of all the contacts that a Clinic team establishes over the year, those with the sponsor liaison will be among the most important, both for the team's

own benefit and for the benefit of the project and future success of the Clinic program.

Team members typically learn a lot from their correspondence with the liaison. As the representative of the sponsor's interests, the liaison deserves much of your attention. In addition to his or her importance as a client, the liaison will most likely be a technical authority on the subject of your project.

As the sponsoring organization has made a significant commitment to your project, it is important to make a good first impression on the liaison. In your first meetings with the liaison, try to express your excitement about the project. Make sure to take notes and ask many questions. For any face-to-face contact with the sponsor, you should dress and act in a neat and professional manner, although business attire is usually not necessary.

Some liaisons may be hard to reach, but it is essential that your team maintain regular contact with him or her. This will avoid many problems and keep the team on track with their sponsor's interest. The project manager and the faculty advisor should work together to maintain close communication with the sponsor liaison. Ask the liaison what is his/her preferred form of communication.

If you are having any difficulty reaching or otherwise interacting with your liaison, please make sure the Clinic Director is aware of the issue.

4.4 Using E-Mail

In general, it is crucial to the success of a project that all those involved are always fully informed as to what is going on. Proper use of the team's e-mail aliases can help insure this. As discussed in Chapter 9, each team has two email addresses, one of which reaches the members of the team and the faculty advisor, and the other of which reaches the liaison as well. When communicating with other members of the team, it is generally advisable to use the team e-mail alias, so that everyone knows what is going on. When communicating with the liaison, we similarly strongly encourage you to use the alias including the liaison, rather than the liaison's direct e-mail address. Should the liaison accidentally reply directly to you as an individual forward the response to the team and, in your next e-mail to the liaison, gently encourage him or her to use instead the alias that reaches everyone.

5 Keeping Records

Maintaining written records of the team's activities will make the task of managing a Clinic project much easier. Written records can save hours of otherwise wasted time spent recalling and reproducing information about

the project. These records should be entered in the appropriate web pages
in your team's wiki. You will receive additional information about how the
Trac/wiki is organized and managed early in the term. Several key types
of documents deserve further consideration in this handbook.

For the purposes of keeping records, each team should ideally desig-
nate a team secretary, responsible for maintaining and distributing meeting
minutes, trip reports, and dealing with other paperwork the team may en-
counter.

5.1   Meeting Minutes

By keeping a record of all of the meetings during the year, a project team
gains a clear understanding of where they have been and where they are
going. The minutes should include:

- Date, location, time, and persons present

- Accomplishments since last meeting and assignments for the next
  meeting

- Important changes in the status of the project (goals, schedule, task
  assignments, etc.)

Following meetings, it is a good idea for everyone to review the min-
utes. Otherwise, it can be easy for people to forget about tasks assigned to
them.

5.2   Trip Reports

For each trip, the team should designate in advance a scribe to take notes.
Note-taking during a site visit can be a vital tool for understanding both the
technical nature of the project and the interests of its sponsor.

While one person has ultimate authority for meeting minutes and trip
reports, all members should take notes of those facets of the discussion that
are relevant to their part of the project.

5.3   Maintaining the Project Trac/wiki

As mentioned earlier, you are required, as a team, to maintain a project
Trac/wiki, or an equivalent site, detailing the progress of your project. This
will provide an important means of communication with the sponsor liai-
son. It provides the liaison with an up-to-date view into the running status
of your project, including all reports, timelines, etc. It is also a useful source
of information for your advisor and all the members of the team. To that

end it is particularly important that the wiki be kept up to date with recent meeting minutes, and, in particular, task assignments, as often as possible. The details of the requirements for this wiki are found in Chapter 6.

Chapter 4

Guidelines for Written Reports

As described above, during the course of the year, your team will need to periodically present a written account of your progress. Essentially, this includes both a description of the problem at hand and a discussion of the solution. This discussion will include technical details about the project and logistical details of your team's work. The following guidelines in this section may help you in your writing.

Note that, in addition to the guidelines here, your advisor may place a variety of additional specific requirements on how you approach the process of writing your reports and submitting them for approval. For example you may be asked to make use of the HMC Writing Center to improve the reports' content and style.

1 Consider the Audience

When writing the main text of a report, always consider the exact nature of the intended audience. When writing, ask yourself the questions "Will the intended audience understand and appreciate what I am writing?" and "Am I adequately conveying the ideas I hope to express to the intended audience?" Often a single document may address several audiences. For example, a report may outline the project in a non-technical manner, and then go into more technical details later, or in an appendix. In these situations, you should consider the placement and order of the different sections relating to different audiences.

While the reports are obviously going to be read first and foremost by your liaison, it may be best not to think of the liaison as the primary audi-

ence. First, the liaison may pass the report on to other people at the sponsoring organization who are not directly connected to the project and may therefore be less familiar with the project's background and goals. Second, if you focus on the liaison as the audience, you may be inclined to gloss over details that you assume are shared knowledge. An important purpose of these reports is to insure that such knowledge really is shared; that you and the sponsor are on the same wavelength.

2   Write for Understanding

You should make your writing as clear and understandable as possible. Consider beforehand the purpose of the document and how you intend to fulfill that purpose. Lay out ideas in easy-to-understand language. To make your documents more understandable, it is important to define any technical terms that may not be understood by the audience. It will be helpful to provide a glossary of such terms in an appendix. Don't be afraid to include details that may lead to greater understanding. This means that important ideas can be repeated. Also, don't try to say too much in too little space. Instead, break up complicated concepts across several sentences. Often, a visual or graphical representation can go a long way towards getting your ideas across.

3   Be Precise, Thorough, and Detailed

At each stage of the project, the report is in part an opportunity to demonstrate to the sponsor just how much you understand about the problem at hand. The more you can make clear that you know what you are doing, the more easily the sponsor can accept your judgments and results. To that end it is important that you be detailed about your knowledge. For example, if some aspect of your project depends on a particular API (application programming interface), then you should include some discussion of the API at the level of the calls you are likely to need to make; if it depends on a particular protocol, show diagrams or tables describing the protocol. Always cite appropriate sources.

This sort of knowledge should be demonstrated as early as possible. Although the Statement of Work is not generally a very lengthy document, it is important to make the depth of your initial research clear. It should be clear to the sponsor that your design decisions and plan are based on a thorough understanding of the technical underpinnings of the project.

4 Make an Adequate Number of Citations

Like any other academic document, all Clinic reports are expected to make adequate use of citations to source material for the concepts described. These citations may be to research papers, magazine or journal articles, published API specifications, user manuals, training guides and reference manuals or even to sponsor-provided documents, and documents available only on the worldwide web. When in doubt, cite. If you are unsure how to cite a particular sort of document, ask your advisor. Web citations should always include a date visited. Citations should be made to a bibliography included as an appendix to the report.

A good tool for doing citations is BibTeX. If you use it from the start, you'll be able to reuse citations throughout the project, rather than create them from scratch for each written document you produce. BibTeX can be fickle, however. To use BibTeX in your Clinic documents, try the following steps:

1. Place `hmcmath.bst` in the same directory as your TeX document. The file should be available with the report template.

2. Create a file called references.bib. In it, add the BibTeX entries for source you wish to cite. There is lots of documentation for how to do this online.

3. Each time you want to cite a source inline, do the following:

   ```
   A sentence that needs a citation~\citep{lee12}.
   ```

   Where `lee12` is the name of a BibTeX entry.

4. Add the following lines at the end of your TeX document

   ```
   \backmatter
   \bibliographystyle{hmcmath}
   \bibliography{references.bib}
   ```

5. To compile BibTex correctly, you must run LaTeX, BibTeX, LaTeX, LaTeX. Running LaTeX once more for good measure couldn't hurt.

6. If you run into issues, here are few troubleshooting tips:

   - Email latex-l@hmc.edu, the HMC LaTeX enthusiasts group.
   - Check the log file (which is generally good practice when working with LaTeX).
   - Delete all auxiliary files and try again.

5   Use a Consistent, Professional Format

Beyond its content, the report will also be judged by the quality of its presentation. For written reports, this includes both writing style, and overall format. The report should look as professional as possible. This means correct spelling and grammar and an easy-to-read layout. An attention to detail, and perhaps even a certain amount of flash in a report, can go a long way in pleasing the sponsor. Most importantly, though, whatever the format, the report should remain consistent in its formatting choices.

The Final Report (discussed below) will be bound in a custom hardcover format. To insure an attractive presentation and a simplified printing process, it is preferred that teams use LATEX to write the final report and should make use of a standardized style file provided at http://www.math.hmc.edu/computing/support/tex/classes/hmcclinic/ . To prepare you for that process, the Mid-Year Update should also be prepared using that LATEX format. A second choice, preferred by some sponsors, is to use Microsoft Word. Check with your sponsor liaison to determine whether he or she has a preference.

We recommend that you use double spacing in drafts of reports given to your advisor. However, the final version of any report sent to the liaison should use single spacing.

6   Proofreading Requirement

To improve consistency and general quality, we require that every member of the team read and sign off on the entire report *before* it is submitted to the advisor. It is not sufficient to have members write and correct sections independently and then have one member assemble the whole from those parts without review from the others.

7   Key Sections to Include in the Report

There is no one perfect structure for any of the standard reports you will file during the year. You must find your own style and structure. Nevertheless, there are certain sections that all of the reports should probably have:

7.1   Background

This section describes the context of the project both within the sponsoring organization, and within the larger framework of current systems. In particular, it discusses existing systems, standards, etc. that motivate the need for this project.

7.2 Problem Definition

This section is a detailed description of the task that has been set before you. Normally, it is not the same description originally given to the team by the liaison. Rather, it is the problem definition you have arrived at over the several weeks of research and discussion as indicated by your statement of work. It should, therefore, highlight any major changes from the original specification, so as to insure that these changes are agreed to by all parties.

The core of this section should not change appreciably after the statement of work. Significant shifts in the focus of the project after that should be reflected by additions to the section, so that the fact that there was a shift in focus is readily apparent.

7.3 Deliverables

Enumerate those items that you promised to deliver to the sponsor, indicating which ones you actually delivered.

7.4 Approach to the Problem

This section describes how you will or did attack the problem. This should be as detailed as possible. In particular, it should include possible solutions that were considered and rejected, algorithms used, outside tools and software that were incorporated, similar solutions that you found during your research.

7.5 Schedule and Labor Budget

This section outlines the time spent, or to be spent, on the project. It should include project schedules, labor budgets, and problem assignments to the individual team members. These should also be as detailed as possible, and should, in particular, include plan-versus-reality discussions in the Mid-Year and Final Reports.

8 Other General Guidelines

In addition to these sections, and such others as you deem necessary, all reports should have an abstract, a well-structured table of contents, lists of figures and tables if appropriate, and a bibliography. You may also want to include brief biographical information on the team members, focusing on the skills, experience and interests they bring that are relevant to the project.

Obviously, each of these sections, particularly the approach and schedule, will change between the statement of work, the mid-year update, and

the final report. However, they provide a common framework for structuring all of the reports. Note that while we mention the possibility of reusing sections from one report in the next, this should be done with care, and at the very least you must make sure that the verb tenses make sense for their context.

You are encouraged to get copies of previous reports to use as a guide. Of course, not every old report is a good one. A good idea is to ask your advisor or other faculty what past project teams they think generated particularly good reports, and focus on those.

9   Note on Mailing of Reports

The Clinic Coordinator will coordinate the mailing of all reports to the project liaisons. This will enable us to file copies in our archive and log the mailing of these key deliverables. You will need to provide two copies each of the statement of work and the mid-year report, and several copies (one for advisor, one for *each* liaison, one for each team member, one for the library, and one for the file) of the final report.

10   Comments on the Individual Reports

10.1   Statement of Work (SOW)

What Is a Statement of Work? Your SoW is your team's commitment to your sponsor. It includes a statement of what direct support—if any—you will receive from your sponsor, including items such as software, hardware, data, or written materials. It will also serve as a commitment by your sponsor to not demand more from your team than you agreed to do. Your SoW amounts to a contract between your team and your sponsor, so it is important for you to prepare it carefully and to conduct your negotiations with your sponsor's representatives with caution. Never use technical terms that you do not thoroughly understand in your SoW; otherwise you may discover too late that you have promised to do the impossible. Make sure that you understand your SoW very well before you open discussions with your sponsor's liaison.

A project's SoW needn't be very long; typically it should be no more than five to six pages when typeset using the hmcclinic LaTeX class file. The document spells out what your team is agreeing to do and, in turn, what you need from your sponsor and when you need to receive it to get the work done. Remember it is better to under-promise and over-deliver than vice versa.

Important Note: Do not give your liaison a copy of your draft SoW until after the Clinic Director has had a chance to review it and discuss it with your project manager and faculty advisor. Be sure to keep the director in the loop to help you avoid pitfalls.

Not giving your liaison copies of your working document doesn't mean that you shouldn't discuss your ideas with them before submitting the completed document. Since you will need your liaison's final approval, you should do your best to find out what your sponsor is expecting from your team.

Note that LaTeX is required both for the SoW and for your future reports.

Who Will Read Your Statement of Work? When writing any document, you should consider the audience for the document. Your expected audience will largely determine the style and vocabulary of your final document. The SoW is not meant solely for experts. It will be of interest to several parties of differing backgrounds and knowledge, not just your liaison, your advisor, and yourselves. For example, your sponsor's management, who funded the project, will need to understand what they paid for and be able to justify the expenditure to their own managers. If your work is successful and generates interest in implementing the results or in continuing the line of research, managers will once again be tapped for funds, and a later project team, who are not necessarily experts at the outset, will need to come up to speed on the project just as you did. A clearly written SoW, along with your final report, can be used by them as their starting points.

At the same time, you should recognize that not everything can be explained to the lay reader. Your choice of language is a matter of judgment. Just keep in mind that your Statement of Work must serve readers of multiple backgrounds and purposes. Define all acronyms, explain the technical terms, avoid esoteric language and use plain English where possible.

Content and Layout of Your Statement of Work

Your SoW should contain a description of the project as you and your team imagine it will progress. On the broadest level, you will probably want to include sections that roughly correspond to the following elements:

Problem Statement: A succinct restatement of the problem as presented to you by the sponsor.

Background: Some information about the sponsor, what they do, why they're interested in the problem, and so forth.

Goal: The overall, long-range, end result that your research is aimed at achieving; where you are ultimately trying to get. Stating a goal does not mean you believe you will achieve it during this project; it is the grand view towards which you strive. For example, the goal of HIV research is to find a cure for AIDS.

Objectives: The specific things that you will try to achieve during the course of your project; the immediate targets of your research. Your objectives spell out how you have parsed the problem of the ultimate goal into the smaller pieces that you will work on. The objectives set the practical limits on your work. They point to what your team can reasonably expect to achieve. The objectives should clearly fit into and lead towards the long-range goal.

Optional Objectives: The objectives the team will pursue if time permits.

Tasks: The specific things that you will do to achieve your objectives. The tasks drive your determination of what skills and other resources (e.g., data, software, hardware, written materials, work environment) will be needed for your project. If any of these resources must be supplied by the sponsor, you will need to specify those items in your SoW.

Schedule: A list of dates and times that specifies when you will finish major parts of your project and provides a timetable for completion of deliverables. Internally, you should maintain as fine-grained a schedule as you need to keep your team coordinated and on track, but in your SoW it is best to make the schedule and list of deliverables as modest as the sponsor will allow.

Contingency Plan: If your project does require your sponsor to provide some important element, make sure that your SoW includes a last acceptable date for delivery of the material and contingency plans that will allow you to proceed in the event of a failed delivery. Note that this category could include, for example, consultation provided by the sponsor on the use of special equipment or software.

Milestones: A list of specific accomplishments that you can use to mark progress and maintain pace and coordination within your project. They will help your team to stay on track and to determine the success of a chosen line of attack on your problem. A list of milestones may or may not be included in your SoW, but you should definitely think them through for your own use as you plan your project and SoW. They are checkpoints for you (and for your sponsor, if they are included in the SoW), not deliverables.

You may want to specify major milestones in your SoW to indicate what you would do if your research leads to the conclusion that some objective cannot be accomplished. For example, "If by some date we have found it impossible to achieve X, then we will begin Y." Research is exploration of the unknown, so you may bump into an intractable obstacle and need to work around it—you can't know everything

ahead of time. Give some thought to these concerns and try to set milestones that allow you to judge how well you are proceeding towards your objectives and deliverables and what you need to do to proceed effectively in the event you don't meet a milestone.

Deliverables: The things you promise to deliver to the sponsor. In addition to any prototypes and code, for the project, other deliverables will include a midterm and final report, a poster, and a final presentation on Projects Day. They may also include site visits to the sponsor (usually one near the beginning of the project to get acquainted with the sponsor, and possibly one after Projects Day to present your work at your sponsor's location); written results of literature searches; white papers (i.e., written background information on such things as plans, methods, or concepts prepared for internal use); and so forth. These additional items are to be decided by you in consultation with your liaison. Your SoW need not use the vocabulary terms introduced above, but it should address the issues that they cover. And your SoW need not be as fine-grained as this example implies. For example, your team might set internal milestones as a way of maintaining pace and coordination but not include some or all of them in your SoW. Your SoW is like a recipe—getting the right ingredients and the right amount of each ingredient is a bit of an art.

Formatting Your Statement of Work To help you format your SoW, HMC provides a LaTeX document class, hmcclinic.cls, that can be used for your SoW as well as for your midterm and final reports.

The document-class file takes care of most of the basics of formatting your SoW, including formatting a title page and setting margins, fonts, and other common design elements of a document.

Using LaTeX gives you powerful text and mathematics typesetting and reference tools that will allow you to concentrate on the content of your report rather than the formatting minutiae that word processors encourage.

Important Note Note that the SoW document-class option forces the document to typeset as an article rather than a book. Thus your Statement of Work should use the `\section` command as the top-level structural command rather than the `\chapter` commands you'll use in your midterm and final reports.

Negotiating Your Final Statement of Work with Your Sponsor Your SoW is a contract. It is the document that defines what your team will produce and what your sponsor will provide to make that work possible.

The trick is to figure out how to promise the right amount of effort without promising too much – you need to commit your team to goals that are within your abilities in the available time and that will make the sponsor happy. Be as modest as is reasonable. If you deliver everything you've

agreed to, or more, you will please your sponsor. If you deliver less, you will disappoint yourselves as well as your sponsor.

The SoW is not a one-sided document. If your team needs anything from your sponsor to complete your project – data, software, hardware, literature, services – anything essential to your project that you can only get from your sponsor, you need to ask for it in your SoW and make the consequences of not receiving those items clear to the sponsor. You should be aware that your liaison may (in good faith) promise more than the sponsor's managers and lawyers will actually allow. In particular, some types of data, software, hardware, and other proprietary or expensive items often prove not to be available. So be sure to include a last-acceptable date in the SoW and an alternative course of action that you will pursue if you don't receive the promised items by that date.

For example, failing the receipt of promised data you might state that you will generate your own simulated data. Failing the receipt of software, you might state that you will prepare alternative prototype software, but you should recognize that writing that software might turn out to be a major undertaking and affect your ability to make progress on the core problem. Thus you should take into account the fact that the sponsor's failure to deliver on their promises may slow you down and require that you moderate your commitments accordingly. Cautious contingency planning can save you grief later.

If your sponsor demands more work than you think you can reasonably commit to doing, try using phrases such as, "Time permitting, we will attempt to do X", or, "If our research leads successfully to A, we will then proceed to investigating B." Statements such as these show that you are aware of where your sponsor wants to go and that you are committed to trying to get there, but also serve as fair notice to the sponsor that you believe it may be asking too much to insist on B given the reach of the project's goals and the restraints your team is working within.

Intellectual Property Ownership Remember that the sponsor owns all the intellectual property generated by the project. You may not use your results for your own purposes, or give them away to others, without written permission from the sponsor. You may be required by your sponsor to maintain confidentiality of your progress and results.

Be sure to ask your liaison if your sponsor has any confidentiality concerns over and above those that you are agreeing to by signing the standard Clinic confidentiality form. In some cases, your sponsor may be willing to, or even desire to, have your progress made publicly available over the web, but any such exposure should be cleared with your liaison in writing first.

10.2   Mid-Year Update

This document should reflect on where you are versus where you expected to be at this point. What parts were easier? Where are you behind? Then you should present revised plans, including a "backlog"–a prioritized task list for the spring. The backlog is project-dependent; it might be a list of functions to write, a list of experiments to be performed, or something else entirely. The important part is that it's prioritized, and that it will serve as a to-do list to guide the future of the project.

Write this document so that it both presents a coherent snapshot of your work to the liaisons and will be useful for the entire team upon returning after Winter break, when you will probably forget everything about your project.

Bear in mind that since this document is no longer a comprehensive report, you may wish to document some of work in another form in anticipation of the final report. Do you future selves a favor and at the very least prepare some notes or an outline that you can later use for the report.

10.3   Final Report

The Final Report summarizes the results of your year-long effort. With your Final Report in hand, someone unfamiliar with your project should be able to quickly understand your problem and achievements. Also, write the report so that someone could easily continue or extend your work. Ultimately, many will judge your work by the contents of this report, so it is to your benefit to make it as professional as possible.

This report should include a recounting of the problem, the conduct of your effort (including how your actual performance related to your original schedule), a description of the results (including code documentation and, generally though not necessarily always, all the actual code), and a detailed discussion of recommendations to the client.

Note that, occasionally, a sponsor may request that in place of the Final Report the team prepare a research paper describing the project for submission to a scholarly conference or journal. In that case you will receive extensive guidance on format and coverage from the liaison and your faculty advisor.

How to print your final report: All copies printed, not copied, and double-sided, using the special Hammermill paper found under the printer on the 2nd Floor of Sprague or for reports with color pages use the color printer named chp in Olin 1256. Note that this is a relatively slow printer, so be sure to allow enough time, since some groups will be printing over a thousand pages! The number of copies needed should equal number of students on the team, plus number of liaison(s), plus 4 additional copies.

Additional information regarding chp, you can find it at chp.cs.hmc.edu, and there is a "chp" queue for it on cortana.   The IPP URL is ipp://cortana.cs.hmc.edu/printers/chp although some versions of Windows need it in the format http://cortana.cs.hmc.edu:631/printers/chp.

Chapter 5

Guidelines for Oral Presentations

Throughout the year, your team will make four distinct presentations during the Tuesday sessions. Phase I and II will be made in the fall, Phase III in the spring, and the final presentation on Projects Day.

1   Phase I Presentations

Phase I presentations are 25 minutes long and describe the background, the problem, and the organization of your team and project, in a way that others not on the team can clearly understand it. In this presentation, you do not have to show progress toward solving the problem. You only need to show that you understand the problem and that you have a reasonable plan of attack.

2   Phase II Presentations

Phase II presentations are 50 minutes long. At a phase II presentation, one team presents a combined design review and progress report to other peer teams. Depending on the number of projects in a given year, two or three teams present each week, but do so in separate parallel sessions. Thus not everyone will see every team's phase II presentation. In phase II, you should limit the number of prepared slides, in favor of having team members present aspects of their parts of the design on the whiteboard. The audience is expected to ask penetrating questions of the team under review. The presenting team is advised to anticipate some of those questions and be prepared with answers to them.

3   Phase III and Projects Day Presentations

Each team gives one presentation during the third phase. As described earlier, at fifteen minutes these talks are shorter, more formal, and less technical than the talks in the first phase. The talks during this phase can also be used as a practice run for the presentation given on Projects Day. These presentations are generally prepared using PowerPoint, Keynote, or other presentation software, and presented from the computer, though other modes are acceptable. Most teams practice the talk until it can be presented smoothly. Your faculty advisor will probably want to be involved in the preparation of the talk and see you rehearse it several times.

As these talks are intended for a broader audience, you must be careful to get the right balance between providing the audience with a sense of the depth and challenges of your project, and overwhelming them with technical details. Be careful in particular to limit the amount of jargon and the number of acronyms used. In direct contrast to the Phase I and II talks, detailed descriptions of protocols and such is probably too technical for these presentations.

The schedule of the Phase III talks is set by the various Clinic programs in joint consultation. The order of the talks within a week is coordinated by the Engineering department. Mid-week of the week before your presentation, you will receive an e-mail indicating the order in which the teams will present. This order should be used for the practice times as well. The night before, Galileo McAlister is available for practice sessions, with the A/V equipment set up.

4   General Guidelines for All Presentations

4.1   Make sure your slides can be read

People almost always try to put too much text on slides. This is especially a problem with PowerPoint, because by default it will automatically reduce the font size as you add more text to a slide. You can disable this horrible misfeature by selecting `Tools->Autocorrect ...`, choosing the `Autoformat As You Type` tab, and unchecking `AutoFit title text to placeholder` and `AutoFit body text to placeholder`. Text on a slide should never be smaller than 24 points, and preferably 32.

In general, ten lines of text is the practical upper limit for a slide oriented in landscape format.

As with learning to speak at the right volume, the only way to know whether your slides are readable is to take them down to the lecture hall and look at them from the very farthest seat. Pay particular attention to

slides that incorporate figures from other sources, since they are often the source of font-size problems. It's not enough to check that the slides can be read. Make sure they can be read easily—remember that some in your audience may not have particularly good vision.

In the unlikely event that you use handwritten slides, or transparencies that you plan to write on, be sure to check the size of your handwriting in the lecture hall. Most people's natural writing is too small for presentations.

4.2   Prepare a backup of your slides, and allow time to set up

A lengthy transition time between two teams presenting can make the audience restless, especially if there are complications. Therefore, we must do everything we can to minimize this time and make the transitions quick and smooth. To that end, at least one member of your team must arrive at the presentation hall at least 15 minutes prior to the talk time (that is, by 10:45 A.M.). At that time one member should get the presentation copied over to the desktop of the presentation computer and make sure that it has transferred properly. Then, when it is time for the team to speak, all that is necessary is to double click the file and go. It is unacceptable for a team to login to another computer or copy the talk from disk while the audience is waiting.

Technical problems are a fact of life, and seem to be a certainty with regard to Clinic presentations. Therefore, you must come to your presentation with the slides available on a portable USB storage device. Use *both* Keynote and pdf. Do not plan to fetch it from a subordinate directory during the presentation interval. IMPORTANT: Make sure your presentation is on the computer desktop before you present and to turn off all automated reminders in Microsoft that may disrupt your talk.

In general it is preferable to have all presenting teams use a single computer to minimize cut-over time. If there is a legitimate need for your team to use a different computer (such as custom hardware being demonstrated) it is important that you notify the Clinic Director well ahead of time (no later than Thursday of the week before your talk) so that any potential complications can be discussed and anticipated.

4.3   Dress appropriately

While the presentations in all phases are attended mostly by students and faculty, more often than not there will be several outside observers, such as liaisons, prospective sponsors, or prospective students and their parents. On days that the Clinic Advisory Committee meets, there might be around a dozen professional observers present. While you may scoff at the notion, the reality is that many of these people will equate your level of dress

with how serious you are and how much you care about the project. For the spring presentations you should wear business attire, i.e., coat and tie for men, and either a business suit or dressy blouse with pants or skirt for women. If you have any question as to whether something is appropriate, check with your advisor or the Clinic director well before the day of your presentation.

4.4   Make sure you can be heard

Presentations are generally delivered in one of the large auditoriums. You may not realize just how much effort is necessary to make yourself heard in these rooms. During the week before your presentation, go down to the hall where you will talk and have a friend sit towards the back of the room. Practice talking until you can be heard easily. Consider requesting a microphone for your presentation. This will allow you to speak much more naturally while being heard easily. Remember to practice speaking at the level you can be heard

Prior to the start of the talks, coordinate with the other teams who will be presenting regarding computer use. Everyone's talk should be on the computer desktop, not inside a folder, not on a USB drive or a CDROM (except as emergency backups). This is to minimize annoying avoidable gaps between the talks, which cut into everyone's time. Avoid situations that would require rebooting a machine or operating system in particular.

The AV department or the CS Clinic Coordinator will have available a remote control USB device for changing slides. It will also contain a laser pointer. Thus, at your option, it is not necessary to assign a team member to change slides.

Please use the microphone when you speak. It makes for a better presentation to have everyone use it uniformly than to have some use it and some not. Switching between miked and non-miked adds extra discontinuity.

4.5   Make sure questions posed to you can be heard

Repeat any questions that audience members ask. This is especially important for the Phase III presentations, partly because only what's spoken into the microphone will be in the video recording. When one team member goes to answer the question, the other team members can quietly whisper to remind him or her to repeat the question.

Chapter 6

Guidelines for the Project Trac/Wiki

Trac/wiki pages for internal project information are stored at:

```
http://www.cs.hmc.edu/trac
```

This Trac/wiki is to be used to distribute code, electronic versions of reports, etc. to the liaison, to maintain current information about project schedules, task assignments, etc. You may need to spend a few minutes learning the Trac/wiki protocol. See the end of this section for alternative tools for documenting the project.

1   Content Requirements

The project Trac/wiki is a vehicle of communication:

- among team members

- from the team to the sponsor

- from the team to the Clinic director and others not directly in the project, and in some cases, from the sponsor to the team

We are aware that your schedule is already very full and that maintaining information on the Trac/wiki may seem like an extra burden. However, the alternative of having no communication other than word-of-mouth about project status is not acceptable. (We don't endorse the "big-bang" model of development.) Thus we ask that team members jointly allocate the necessary time to keep the Trac/wiki up-to-date during the lifetime of

the project. The information that you provide can be terse, but it needs to be there.

Among other things, the Trac/wiki shows progress that your team is making and issues it is facing. How diligently this policy is followed can play a role in determining your grade. We have already made an effort to minimize the number of distinct Trac/wiki topics, and would appreciate it if the provided template were followed without modification. We are always open to suggestions for improvement of the Trac/wiki structure, but please do not make them unilaterally.

You may certainly include other items on the Trac/wiki, and indeed your advisor or liaison may have specific items not listed here that they would like to have on the Trac/wiki.

Many of the documents that you must maintain on the Trac/wiki will be created in word processors, drawing tools, etc. Wherever possible, the Trac/wiki should contain both the source document and some form that can be rendered directly in the web browser. Typically, the latter would be an automatically generated HTML or PDF version of the document.

The predefined topics are listed below. If a topic name is predefined, you must use it for the given purpose so that others (e.g., your liaison and the Clinic director) will be able to find things in well-known places.

- TitleAbstractDescription:

  This topic contains:

  - Project title
  - Project abstract
  - Extended project description (once that is established)

- ProjectPersonnel:

  This topic contains:

  - A table of all personnel connected with the project and their contact information.
  - Task lists broken out by member
  - Links to individual member logs, named by the user's wiki name and the word "Log", e.g. JaneSmithLog.
  - There should be at least one log entry each week, normally completed before the Tuesday 11 A.M. meeting.
  - The log entries contain:
    * Tasks completed during the past week
    * Tasks still in progress from the past week

        ∗ New tasks created in the past week

   – Each task should be identified as a separate Trac/wiki topic. In that way, the item can be multiply referenced, for example if two or more people are working on the same item. The referenced page should show the status of that task.

- MeetingScheduleAndLogs:

  This topic contains:

  – The current regular schedule of meetings

  – List of meetings, most recent first

  – Each meeting log is a separate Trac/wiki topic identified as follows:

       sponsor Log *month day*

  For example,

       LaserficheLogSept05

  and containing the following information:

      ∗ Current status of the project

      ∗ Summary of progress as reported by the team members (It is OK to reference individual reports to avoid replication of details.)

      ∗ Decisions made at the meeting

      ∗ Unresolved issues

      ∗ Goals for the next meeting

- ProjectDeliverables:

  This page will state the target deliverables once they have been agreed upon with your liaison. It will be refined in the first month of the project, in conjunction with the work statement. You should also use this as a place to link user documentation.

- DevelopmentParameters:

  This topic contains:

  – Description of the development model being used (an actual description, not simply a buzzword such as "waterfall model")

  – Version control description

  – Bug-tracking description

  – Any other clarifying information about the project

- SchedulingDiagrams:

  This topic contain:

  - Work Breakdown Structure
  - Precedence diagram
  - Project Schedule

  Note: Both testing and transition to the client must be scheduled.

- DesignDocuments:

  This topic contains documents describing your solution to the problem, at a level that could be used by someone else to complete the implementation.

- CodeDocuments:

  This topic contains:

  - References to coding standards being used
  - Link the to bug-tracking system
  - Doxygen- or javadoc- generated (or similar) comments for all code
  - Data format descriptions, with links to sample data

- TestingInformation:

  This topic contains:

  - Test plan
  - Testing methodology
  - Testing results

- ReportsPresentationsPosters:

  Separate attachments for:

  - Statement of work
  - Phase I presentation
  - Phase II presentation
  - Mid-year report
  - Phase III presentation
  - Poster
  - Final presentation

- – Final report

- BibliographicLinks:

  This topic contains:

  - – Listing and links to bibliographic and research items

- ProjectGlossary:

  This topic contains a glossary of all project-specific terms

2 Alternative Project Management Tools

Some teams or even liaisons may prefer if the source code and project documentation is hosted with a toolsuite other than SVN & Trac. (What could possibly be better, right?) A good alternative is GitHub. This will require all team members to create GitHub accounts. Whoever makes the repository should ensure it is private. Free student accounts come with 5 private repos, though your sponsor may already be registered as an organization, in which case they should create the repo.

Important: always consult your liaisons before putting any project work on GitHub, or anywhere else in the cloud (with the exception of the CS Trac site).

GitHub supports both a Wiki and a ticketing system, which it calls "Issues." The primary text formatting used is Markdown. One nice perk is that is supports spaces in page names. The Issue system supports project milestones, ticket assignments, labels and referencing/closing tickets with commits. Overall the interface is a bit more dynamic than Trac.

Chapter 7

Guidelines for the Project Poster

Each team prepares a poster to be displayed during the registration period and post-presentations reception on Projects Day. During the poster session, the teams stay at their posters so they can answer questions about the project. As discussed above, the poster session has two purposes:

- To provide guests with an opportunity to learn more about the various projects so that they can better decide which presentations they would like to attend.

- To allow guests to learn more about the projects whose presentations they will not be or were not able to attend and interact with those teams.

Thus the poster must at once generate interest and present a fairly complete picture of the project.

To simplify preparing the posters, the CS Clinic has standardized on using Keynote for producing them. Each poster is represented as a single slide 34 inches tall and 56 inches wide, which will be printed as a single sheet on a large-format inkjet printer. To view the template for the project poster see `www.cs.hmc.edu/twiki/bin/view/ QREF/PrintingClinicPosters`. The completed poster must be turned in to the System Administrator (in electronic form) by the published deadline to allow time for the posters to be printed prior to Projects Day.

In general, you should stick to the distributed template as closely as possible with respect to the placement of items in the poster header, overall font use, and font sizes. You may vary the size and placement of text

columns, graphics, etc. (If you have reason to believe you could come up with a much more pleasing overall design for the poster at variance with the template, please discuss your ideas with the Clinic Director.)

1   Clinic Poster Design

Posters lend themselves to a news-writing style: most important information first, working down to the least important information at the end. The contents are not in chronological or any other order. When you think the viewer is going to skim, this is probably the best way to hook them.

Header:

- All teams should conform to the same template for the entire header: the Harvey Mudd College logo is in the upper left and the company logo is in the upper right.

- Both the title and body should be in a sans-serif font, such as Arial.

Body:

- Section headers (Problem Statement, Acknowledgments, etc.) should be smaller than the title and larger than body text, and should be closer to the text block below them than the one above.

- Whitespace is good, especially between sections. If you have a graphic between sections, use lots of whitespace to make it clear which section it belongs to. It is probably better to err on the side of too much whitespace than too little.

- Four columns works well. Five could also work, if the text font is not made too small. Columns containing big text blocks should not be allowed to be more than one third of the page (poster) width, so three columns should be a minimum.

- Blocks of continuous text should be less than half a column long, and should not wrap to the next column.

- Graphics should be scattered evenly among the columns, and should not make the poster symmetrical (e.g., avoid putting all the pictures at the bottom of each column).

- The poster shouldn't have too many different fonts - three seems like a good limit.

Results Secton:

- Unless there is good reason not to, every poster should have a "Results" Section that informs the viewer of the key results.

Eyeflow:

- Eyeflow is the most important consideration for the poster design. You want the viewer drawn to the most interesting points first (i.e., not the problem statement, the company info, etc.), to "hook" them before they've finished their initial skimming and are ready to move to the next poster. Try to emphasize aspects that make your project unique among all the others. Two common eyeflow models are:

  - Center-out eyeflow: If you have a big, attractive visual, then you're lucky. You could use a three-column design, with the center column larger than the outer ones, and the large visual in the center column, lined up with the top of the body. The viewer's eye will be drawn to the center picture first, then the poster header, and then radiate outwards.
  - Newspaper eyeflow: If no visual is larger than any other, the viewer will skim all the visuals, look at the poster header, and then go left to right, looking down each column. You just have to hope that one of your visuals and its caption will be interesting enough to "hook" the viewer.

- Center-out is the stronger eyeflow model, because you can make the viewer look at the most interesting part of your poster first, rather than having them start at the upper-left corner and risk boring them with the company description, problem statement, etc. Nevertheless, newspaper flow does work well.

- A good test of the overall layout is to print the poster on an 8.5 x 11 piece of paper and hold it out at arm's length. If you can read the text and your eyes follow the intended flow, that is a good sign.

Visuals:

- Every visual should have a caption, no matter how much you think it is self-explanatory, and even if it's explained in a corresponding text block. The viewer will look at the visuals before the text blocks, and a caption will help them understand it right away, making it more likely that they'll be "hooked." Having the captions in a smaller face,

bold, and/or in a different font helps the viewer distinguish them from body text.

- Background pictures are generally not a good idea. When the viewer has finished skimming the pictures, you do not want him/her to be distracted by anything, including pictures behind the text, while reading about your clinic project.

- When showing screenshots or other sorts of graphics, it would be good to have lines to the elements you want to point out, and blurbs written about them. However, this isn't a substitute for a caption.

- Bear in mind that the large-format printer has limited resolution for printing color. Keep the visuals relatively simple and use colors with high contrast. Expect some of the colors to come out a little different than how they look on a screen.

Content:

- No one is going to read large blocks of dense body text. It is OK to go light on explanations and such, as long as there is logical progression and you include enough keywords. It's like reading a resume: the viewer will skip all the boring stuff and the stuff he/she doesn't understand, and will latch onto phrases and keywords that are understandable and familiar. You can say that you employed a genetic-learning neural-net in Java to intelligently parse your XML-based distributed-system finite state machine messages, but all the viewer is really going to get is "Java" and "XML".

- Reducing some (but not all) of the material to bullet lists is helpful. This also helps introduce whitespace.

- For dense body text, "graphs" should be used as much as possible. [A "graph" is a really short paragraph—three lines, or so, like what you see in news stories in newspapers. When the text block is longer than it is wide, it's better to break it up visually with lots of indents. Also, graphs help your writing style because they force you to think in short thoughts, especially when there is a lot you want to say but not a lot of space in which to say it.] A section should definitely be composed of multiple graphs. This is more important the narrower the physical column size gets.

The next page contains a sample poster from Projects Day 2004. It follows many but not all of the suggestions above. You may wish to critique it as an exercise before doing your own poster.

2 Sample Poster from 2003–2004

Chapter 8

Guidelines for Deliverable CD-ROM

CD-ROMs, or the modern equivalent, are the method of delivering all final deliverables to the project sponsor. CD-ROMs will be burned for you by the System Administrator, but you must adhere to the stated structure below. Within your clinic directory, use the literal title "cdrom" (all lower-case) for the directory containing all your result files to be transmitted. The reason we desire uniformity here is so that we can easily scan for availability of certain items.

The goal of the CD-ROM is to reproduce all of the deliverables in electronic form. This includes all of the reports, the poster, presentation slides from each of the four presentations, and, most importantly, your code and executables.

The top-level directory structure of the cdrom directory should contain at least the following subdirectories:

```
code/
documentation/
executables/
poster/
presentations/
reports/
SOW/
```

Within the `code` directory you should put the project source code in a clear and organized manner with a detailed `README` on how to build a working system from it. You can supply the code as raw files and directories, and/or as an SVN or similar tree.

The `executables` directory should be provided where practical. Ideally it should be possible to run the executables directly from the CD on a compatible platform. If not, then again, detailed `README` files should be provided on how to install them. Make sure the target architecture of the executables is obvious.

The `presentations` and `reports` directories contain the slides from all of the team's presentations, and copies of all of the reports submitted, respectively.

Note that the System Administrator may make small changes to the project posters during the printing process. You will be provided with the final version of your poster, as printed, shortly before Projects Day. This is the version that should be included in the poster directory.

The deliverables CD is the single most important output we will return to the sponsor. It is vitally important that you invest effort insuring that it is properly created. In particular, you must be absolutely sure that it is the final, (hopefully) working versions of all your deliverables that are included on the disk. While this may seem an obvious point, in May 2000 an otherwise remarkably successful team managed to create and deliver a disk that contained their source and executables as they had existed as of February of that year! Therefore, it is crucially important that after having built your disk structure, copy the directory contents and load them on another computer. Then attempt to follow the `README` files to prepare a successful installation of code and executables as though you were the final user. Remember to delete whatever you copied to another machine since Clinic work is proprietary.

Chapter 9

Facilities and Resources

The Computer Science Department makes a number of facilities and resources available for use by the Computer Science Clinic program. In addition to these resources, several facilities and resources are available for use by all the Clinics at Harvey Mudd College.

1 Computers and Software

Prior to the start of the fall term, the Clinic Director will solicit information from the sponsor liaisons about what they perceive their project's principal hardware and software needs to be. The Clinic Director will then coordinate the allocation of existing computers and software and the purchase of any new machines, software, and supporting items that may be needed for that year's projects.

By default, each teammember gets one machine. This is generally a current desktop Intel-based workstation, running some flavor of Windows usually. Projects where the bulk of the programming will occur on the department server are still provided with a computer, to be used for project documentation and management.

A number of projects require access to more than one computer (i.e., for client-server oriented projects). Those teams will be provided with any additional computers as necessary.

Those teams using Windows-based systems should install and enable Windows Terminal Services so that the systems can be accessed from computers in the CIS PC labs and from the dorms.

2 Standard Software

The CS Department and Clinic maintain a large body of tools and systems for use by Clinic teams. Some examples of tools we've used in the past are:

Productivity:

- Microsoft Office - Word Processing, Spreadsheet, Presentations

- Microsoft Project - Project Management

- Apple Keynote - Presentations, Poster

- LaTeX with TeXShop - Formal Documents, Presentations

- Omniplan (online trial version) - Gannt Charts

Graphics / Animation:

- Omnigraffle - Useful for any type of diagramming, including class diagrams and mock-ups. This software is provided on the CS lab computers and there are trial versions available for download.

- Macromedia Director, Dreamweaver - Useful for prototyping and/or simulating user interfaces.

- Screencast-O-Matic - A Java-based tool for screen recording, which may be useful for demos or presentations.

Should you need other software products to develop or complete your project, do not hesitate to request them from the Clinic Director, or purchase them according to the guidelines in the discussion of purchasing below.

3 Google and Cloud Services

Because of security and privacy restrictions, computer services outside the Claremont Colleges may not be used for the project without prior permission (written or e-mailed) from the sponsor. This specifically includes "cloud" services such as Google Docs, Amazon Web Services, Amazon EC2, Dropbox, Flickr, etc.

A special exception to this rule is Web-based e-mail services such as Google's GMail. Since HMC student accounts are hosted on GMail, that service may be used for clinic e-mail. Similarly, if your normal e-mail is hosted on another Web provider, it is acceptable to use that provider for Clinic

purposes. An important exception is when the project falls under ITAR (International Traffic in Arms Regulations). If your sponsor is a national laboratory, defense contractor, or in the aerospace industry, you should inquire if ITAR applies to your project.

4   System Maintenance

It is the responsibility of the team to do the initial operating system installation and subsequent maintenance of their Clinic machine. The department staff is there to help, but primary responsibility falls to the team. To guarantee that staff can help when necessary, and to insure that we have access to all materials at the end of the year, it is required that you provide Tim Buchheim, the Systems Administrator, with the root or administrative passwords for your team's computer as soon as the basic operating system installation has been completed.

Staff will take the responsibility for performing regular back-ups of the project computers. To that end, early in the semester you will be given directions for how to install the necessary back-up client software. Email Aliases, Directories, Disk Space, Special Accounts, etc.

In addition to the standard systems, each team is also allocated space on the department Unix file server in the `/clinic/2013` directory tree. Each member of the team is a member of the group that owns the project directory and the team wiki directory.

Each team has two email aliases:

`projname13@cs.hmc.edu` and `projname13l@cs.hmc.edu`.

The first will reach the student members of the team and the faculty advisor. The second, which has a lower-case "L" appended, reaches all of those people and the sponsor liaison.

Should you need assistance with accounts or shared directories on the Windows file server (Charlie) or have any other questions for the CIS Help Desk, send an email to help-desk@hmc.edu or please use the web form at http://www.hmc.edu/about/administrativeoffices/cisl/forms/helpdeskreq.html

5   Purchases

Your Clinic team may find it necessary to purchase equipment, software, books, etc. as part of your project. For small purchases (less than $100) this may be done without prior consultation. For larger purchases, you should discuss the purchase with your Advisor or the Clinic Director in advance.

Small purchases may also be made by personal credit card, in which case you should file a request for reimbursement. In this case (as with all requests for reimbursement) you must retain and submit the receipts for your purchase to DruAnn Thomas within 30 days of purchase. Without a receipt there can be no reimbursement. Should you order something over the Internet, make sure that you print the order confirmation page (or similar) in case no printed receipt is shipped with the product. All receipts must show clearly who paid for the item and how.

Once again all requests for reimbursement must be filed within 30 days of the expenditure.

6   Copying, Faxing, and Mailing

To send a fax, use the fax machine in the CS Department office, Olin 1258. You can give documents to be faxed to DruAnn Thomas, as well. This machine can also be used to receive faxes. The phone number is (909) 607-8364.

Documents can be mailed through the usual channels. If you pay for any postage expenses yourself, make sure to get a receipt and file for reimbursement. The Clinic also maintains its own account with Federal Express. You may request FedEx airbills with the Clinic account number on them from the Clinic Coordinator.

As discussed above, the Clinic Coordinator will coordinate the mailing of all reports to the project liaisons. You may also ask that she take care of copying, faxing, or mailing tasks for you. You must, however, give her twenty-four hours notice for such requests.

7   Clinic Workroom and Conference Space

The Clinic work room, Sprague Library, 2nd floor, is the primary workspace for the Clinic teams. This room is configured with workspace for each team, storage shelving for software and documentation, and whiteboards for working through problems as a team. There is also an HP laser printer accessible from all the Clinic computers.

To get access to Sprague's 2nd floor, DruAnn Thomas will submit your name to Facilities to have your HMC ID card coded to give you access to the Sprague elevator, outside west door and stairwell 2nd door. If you have a problem entering any of these areas, please let DruAnn know as soon as possible so that she can get your card corrected.

8 Clinic Kitchen and Snack Food

It is a longstanding Clinic tradition that we provide snack food in the clinic work area as a way of encouraging you to enjoy being there, to work hard, and to avoid starving yourselves when you're in the middle of a coding frenzy. The particular nature of the food is up to you (see below). The detailed rules are as follows:

- The snacks are intended to be consumed when you are working on Clinic. It is an honor code violation to stop by the second floor just because you have the munchies, to take food from the Clinic area to be eaten elsewhere, to provide food to people who are not part of Clinic, or to use the food as a regular substitute for normal meals.

- It is up to you, the 12 Clinic teams, to self-organize the purchase of food. A good system that has worked in the past is if there is a Google Doc where each team signs up for a month in which they will get snacks for the kitchen. This document can also be used to make food requests.

- Costco is a good place to get the snacks; Joyce Greene has a Clinic Costco card that you can use. After you finish shopping, submit the receipt to DruAnn Thomas for reimbursement.

- We would prefer that you use your own transportation; we will reimburse you for mileage at the standard rate. If necessary, Clinic will cover the cost of using one of the college vans to go shopping.

- We have budgeted $300 per month to cover snacks. This should be enough to cover the normal snacks coveted by most students. We are not intending to subsidize champagne and caviar (in fact, as you might guess, alcohol isn't OK)– and we also don't intend that you view the budget as a target to be reached; if a careful shopper can get out for $250, that's a Good Thing. Other than that, the particular choice of foods is up to you, thought we strongly recommend against things that will spoil quickly. As with the task of shopping, you will need to self-organize the decision of what to purchase; it might be useful to do this through your project managers.

- IMPORTANT: We expect that you will keep the second floor clinic space and kitchen areas clean. In particular, this means that you don't leave open food containers sitting around to attract bugs and vermin (which ARE a problem in Sprague). It also means that if you use one of the coffee cups or any other non-disposable dish, you must WASH IT OUT WITH SOAP before you leave the second floor. This does

not mean that you leave it full of water in the sink, hoping that your mother will magically appear and clean it for you. It means that it's ready for the next person to use, even if they're picky. And if you see somebody else violating this rule, please politely remind them that they need to take care of their mess; it only takes a moment.

9   Sprague Conference Rooms

The 2nd floor of Sprague also has two conference rooms: the Glass Conference Room and the Old Conference Room. Both have table to seat a dozen or so, a whiteboard, and a speakerphone. The phone numbers are:

- Glass Conference Room: 909-607-7446

- Old Conference Room: 909-607-0446

10   Department Conference Room

The glass conference room is intended as the primary space for team meetings. In the event that there is a conflict for use of this space, or if you need to meet with a larger group than the space will accommodate, the department conference room (Beckman B100) can be used as well.

Both rooms is outfitted with a conference table seating sixteen, a PC with video projector, and electronic-whiteboard system, and VCR. The conference room is also outfitted with a full-duplex multi-user speakerphone. The phone number for the glass conference room is 607-7460. The phone number for the B100 is 607-1814.

Reservations to use these spaces must be made in advance through the CS Clinic Coordinator.

11   Engineering Clinic Conference Rooms

Should the Computer Science Department conference room be unavailable at the time you need it, it is also possible to use one of the Engineering Clinic conference rooms on the ground floor of Parsons (Parsons 1288/1290/1292). These rooms can be reserved through the Engineering Clinic Administrative Assistant.

12   Telephone Use

Because the conference rooms are all shared with other departments and functions, you must keep a log of all telephone use in these rooms to help

in the accounting process. The team secretary should reserve the last few pages of his/her notebook for a phone log, recording the date, time, location (which conference room), and phone number called for all calls made by the team. If you have a regularly scheduled call to the same number from the same room, it is sufficient to log it once, with a note that it is a recurring call.

13   Video Conferencing

The Engineering Clinic has recently installed a high-end video conferencing system, operating over dual ISDN lines, and capable of full screen video at thirty frames per second. If your sponsor has a compatible facility, then you can arrange to use the Engineering facility for video conferences. Requests to schedule use of the facility should be made through the Lorena Gonzales, Engineering Clinic Admin Asst, x18020 or email to lorena_gonzalez@hmc.edu .

It is also possible to video conference on a lower level using Webcams and software. If your liaison is interested in this sort of conferencing, the Clinic will purchase appropriate hardware for your workstation.

14   Previous Reports

Copies of previous Mid-Year and Final Reports can be obtained from the Clinic Coordinator. Bound copies of past Final Reports can also be browsed in the department conference room. They should not be removed from the room without prior permission.

Chapter 10

Clinic-Related Travel and Dining

Most project teams will travel on Clinic business at least a couple of times during the year. Typically this travel will be to the client site. We strongly encourage a site visit early in the first semester to foster an understanding of the context of the project. A mid-year visit is a good opportunity to make sure everyone is still operating on the same wavelength, and may also be a chance to present the project to others at the client site. Some liaisons request a site visit near the end of the project for this same purpose.

1 Local Travel

For travel in the L.A. / San Diego region, we assume you will be traveling by car. For insurance reasons, you should not use your personal vehicle for this purpose. You may either arrange to rent a car, or one of the HMC vans. In either case, you should have the Clinic Coordinator make the arrangements, as the college has special agreements with certain local rental agencies. Important details about renting a car or using the college van are given below.

2 Airplane Travel

For visits to locations outside the region, we assume you will be traveling by air. You can ask the Clinic Coordinator to arrange airline reservations and car rentals, or you may take care of it yourself (or ask your advisor to do so). In either case we ask that you plan your travel as far in advance as

possible (ideally, at least two weeks ahead) so that we can take advantage of the best airfares. If you are booking airline travel yourself, you should get approval for the airfares, etc. from the Clinic Director prior to finalizing the booking.

3   College Vans, Car Rental, and College Insurance

To use the college van or to rent a car for reimbursement by the Clinic you must first be authorized for the college liability insurance. This requires providing the Clinic Coordinator with two copies of your driver's license and filling out a form authorizing the college to get a copy of your driving record. This process can take up to four weeks, so you should do it early in the first semester to insure you are covered when needed.

If you are renting a car locally or remotely, you must follow these rules:

- Do not purchase any optional liability coverage; you are covered by the college's liability insurance.

- Do purchase the optional Collision Damage Waiver (sometimes also called Loss Damage Waiver).

- Do purchase the optional medical coverage, if you are a student, but not if you are faculty. Faculty should not elect medical coverage, as they are covered by the college's Travel Accident policy and by Workmen's Compensation.

- Do not accept the offered full tank of gas (sometimes called the "fuel purchase option"); fill the car up yourself at the end of the rental and file the receipt for reimbursement. The Clinic will not reimburse you for the fuel purchase option if you accept it.

While car rental companies generally will not allow a driver under the age of 25, the college has made arrangements with the local Enterprise Rent-A-Car office, 376 S. Indian Hill Blvd, Claremont, 909 624-5544, to rent to these drivers once they have been authorized for the college liability insurance. Arrangements for such rentals should be made through the CS Clinic Coordinator.

4   Meals and Snacks While Traveling

The Clinic program will pay for all food expenses (within reason) while you travel on Clinic business. You should pay for these costs yourself, then submit receipts (you must have original receipts) to the Clinic Coordinator

for reimbursement when you return. The Clinic program will not pay for alcoholic beverages.

5 Hotel Stays

Ordinarily visits should be completed in a single day. If the site is particularly distant, or if the liaison has reasons to want you on-site longer, multi-day visits are possible. In this case, the Clinic program will pay for reasonable hotel expenses. In general, students will be expected to share hotel rooms, at least two students to a room, where at all practical.

6 Non-Travel-Related Meals and Snacks

The Clinic program will pay for the cost of reasonable food and meal purchases related to Clinic work on campus. In particular:

- If you find it convenient to schedule a discussion meeting during lunch or dinner and one or more of the team members is not on a dining plan that includes that meal, the Clinic will reimburse for the cost of that meal. If it is a one-time event, pay cash and submit a receipt for reimbursement. If it is a regularly scheduled meeting (note: this should be done only if there is really no other convenient time to schedule it) the Clinic Coordinator will submit a Platt Dining Hall Interdepartmental Charge Authorization form to the dining services staff.

- If you find it necessary to schedule a work meeting at meal time, you may purchase food (i.e., sandwiches, pizza, etc.) for the meeting and file the receipt for reimbursement. This should not be seen as license to regularly milk the Clinic for munchies. Teams perceived to be abusing this privilege will be cut off.

- It is customary to eat out with your liaison if they come to visit at an appropriate time. The Clinic program will reimburse for the cost of such meals, unless meals are being provided for the team at a designated site on campus.

Chapter 11

Projects Day Schedule and Logistics

The Tuesday after the last week of classes in the spring semester is Projects Day, on which all Clinic teams make their final oral presentation. As described above, many visitors (often several hundred) attend Projects Day.

1   Schedule of Events

Projects Day runs from 10:30 in the morning until 6 P.M. The schedule for the day is roughly as follows (This is the schedule from Projects Day 2008, small changes are possible this year, but the overall framework will remain the same.): Student teams are assigned to rooms in pairs. The teams alternate making roughly twenty-minute presentations in half-hour blocks. Thus each team presents three times during the three hours allotted for presentations.

Note that approximately four to six weeks before Projects Day you will be asked to provide a short (roughly one paragraph) abstract of your project for inclusion in the Projects Day program. Sometime in the week prior to Projects Day a packet containing programs, name badges, and a pointer will be left at your workstation in the Clinic work lab.

2   Poster Session Logistics

As discussed earlier, the System Administrator will handle the printing of the posters in the days leading up to Projects Day. The printed posters will be distributed the day before Projects Day. Platt Living and Green Rooms

Time	Event	Location
10:30 A.M.–1:00 P.M.	Registration & Poster Session	Platt Living and Green Rooms (lunch will be provided)
1:00 P.M.–1:30 P.M.	Welcoming Remarks	Galileo McAlister
1:30 P.M.–3:00 P.M.	Project Presentations	Galileo / Parsons / Olin
3:00 P.M.–3:30 P.M.	Break	Hixon Court
3:30 P.M.–5:00 P.M.	Project Presentations	Galileo / Parsons / Olin
5:00 P.M.–6:00 P.M.	Poster Session	Platt Living and Green Rooms

Table 11.1: Tentative Schedule for Projects Day

will be open from 1 P.M. to 1 A.M. that day. During that period some member(s) of the team must take the poster to Platt and mount it on the provided posterboard (using provided pins).

During the morning poster session the poster should be manned continuously by several members of the team (who should already have changed into appropriate clothing).

All team members should be present during the afternoon poster session

3   Presentation Logistics

As mentioned above, each team is assigned to a presentation room with another team, and the two teams each make three presentations in alternation with the other team. You will be informed of your room assignment the week before Projects Day. CS teams will present in rooms with built-in video projectors if possible.

The teams are intended to provide their own computer (typically one of their workstations) for use for the presentation. If at all possible, the two teams presenting should use one machine for both presentations, agreeing in advance which team's computers it will be. This will minimize the delays and potential technical problems that can occur when trying to swap computers between presentations.

The presentation rooms will be available for setup and practice from 5 P.M. onwards Monday night. A security guard is hired to patrol the halls to reduce the risk of theft, as the rooms are generally left unlocked to simplify

access.

In the morning, as discussed above, the bulk of the team should be at the poster session. If all preparations are done, the team may attend the opening session in McAlister at 1:00 P.M. Otherwise this time can be used for last-minute issues. The first team to present should be ready to start on time at 1:30 P.M. During the course of presentations, the team not presenting is free to attend other teams' presentations. They must be sure, however, to be ready to present on time at the beginning of the next slot.

After the last presentation at 5:00 P.M., most of the team members should go to the Platt Living and Green rooms for the second poster session. One or two members, however, should be assigned the task of returning the presentation computer to the Clinic lab and reassembling, or at least re-securing it. This must be done immediately after presentations are finished, since the rooms must be returned to their original use as quickly as possible, and, further, will not be secure on Tuesday night.

Chapter 12

What to Do If Problems Arise

The Clinic staff works hard to make your Clinic experience a valuable part of your academic career at HMC. Nevertheless, as with any endeavor of this size, sometimes problems arise. These problems might be technical, interpersonal, or ethical. The question is: what do you do about them?

Below we attempt to outline some suggestions, depending on the type and scope of the problem. Note however, that these suggestions are not intended to be limiting. All faculty and staff of the college are prepared to intercede on behalf of students in any context.

In most circumstances, it is best not to open the problem to the liaison, at least initially. There are very few problems that they can help solve. Your advisor or the Clinic Director may decide later if it makes sense to involve the liaison.

The first line of defense, in particular if the problem relates to interaction with another team member, is the project manager. He or she may have a suggestion, or may talk to the faculty advisor to get a recommendation.

Next in line is, naturally, your faculty advisor. If you have problems with your teammates, with the nature of the task assignments you have been given, or if you have concerns about something the liaison has told you, these are reasonable concerns to raise with your advisor. Problems might include your feeling that your liaison is building up unrealistic expectations, or that the project has gone off track and you don't know how to deal with breaking the news to the liaison. Similarly, if there is some technical issue with the application or integration of the project results that concerns you, or an ethical concern about the conduct or outcome of the project, you should feel comfortable talking to your advisor about it.

Next in line is the Clinic Director. The Director's door is always open to talk about any aspect of Clinic. A situation in which it is particularly important to go directly to the director is if you feel that your project assignment is utterly inappropriate to your skills or interests, or if you have personal reasons for not wanting to be on the project to which you have been assigned. Obviously, in these situations, the faster you contact the director, the more likely it is that you could be reassigned to another project. (Note that we cannot guarantee that every student will end up with the project, or even the project category, of their choice. We can only make our best effort.)

Finally, and most importantly, if you have exhausted your options within the program, or are uncomfortable approaching one of the people mentioned above, then you should realize that, as mentioned above, you can go to any faculty or staff at the college for support. In general, because the college does not have an ombudsman, there is a tacit presumption that any faculty or staff can represent a student in a difficult situation.

Chapter 13

Things You Probably Missed

You should have read the handbook thoroughly. But even then (and especially if you don't) it is possible to miss some things. Below is list of some useful tidbits. If many of these are new to you, it'd be worth looking through the handbook again.

1. For an Acme team for the 2012-2013 academic year, the email aliases are of the form:

   - acme12@cs.hmc.edu (team with advisor)
   - acme12advisor@cs.hmc.edu (advisor only)
   - acme12l@cs.hmc.edu (team with advisor and liaisons)
   - acme12liaisons@cs.hmc.edu (liaisons only)

2. It is each team's responsibility to obtain and install the operating system they choose to use for their clinic machines.

3. The end of the project gets very busy. You will be juggling feature freeze, designing a poster, writing a final report and preparing your final presentation (and possibly your phase III presentation as well, depending on when yours is scheduled). It is worth discussing and scheduling work for these milestones before spring break.

4. Doxygen is an excellent tool for documenting your source code.

5. We expect each team member to invest an average of ten or more hours a week on Clinic.

6. It is important for you to come to the team meeting prepared and on time. Otherwise it is simply disrespectful to everyone else.

Appendix A

Instructions for Tuesday Clinic Team Presentations

While we realize that you are extremely focused on getting your presentation ready, we'd like to call your attention to a few inter-team issues that need to be addressed before and on the day of your presentation. Please use this document as a checklist.

Please email the name of your project to DruAnn by the Thursday before your presentation and who your first speaker will be. This information will be conveyed to the Master of Ceremony. Prior to the Tuesday's Presentation an email will arrive indicating the order that the teams will present (the practice times will be the same order). The appropriate dress for the presentation is business attire, i.e., coat and tie for men, and either a business suit or dressy blouse with pants or skirt for women.

The Tuesday presentations are 20 minutes long. The talk should be 15 minutes and 5 minutes for Q&A. The night before, Galileo McAlister is available for practice sessions, with the AV setup. The practice times will be in the same order as your presentation on Tuesday (one of the following times 6:00-7:30 PM, 7:30-9:00 PM, 9:00-10:30 PM). If your team cannot practice during the assigned time, please make arrangements with the other teams.

Prior to the start of the talks, please coordinate with the other teams who will be presenting regarding computer use. Everyone's talk should be on the desktop, not inside a folder, not on a USB drive, not on a CDROM (except as an emergency backup). This is to minimize annoying, but avoidable, gaps between the talks, which cut into everyone's time. Avoid situations that would require rebooting a machine or operating system in particular.

The AV department will have available a remote control USB device for changing slides. It will also contain a laser pointer. Thus, at your option, it is not necessary to assign a team member to change slides.

Please use the microphone when you speak. It makes for a better presentation to have everyone use it uniformly than to have some use it and some not. Switching between miked and non-miked presenters adds extra discontinuity.

When you choose people for questions, try to give preference to students and guests over faculty. Please don't forget: *Always repeat the question before giving your response.*

Immediately following the talks, please gather your team, advisor, and liaison(s) for photographs in the Galileo foyer.

Finally, please enjoy a specially-catered lunch with your team and liaisons in the Green Room, following the talks. If you cannot make this, please notify Barry Olsan at Barry_olsan@hmc.edu in Corporate Relations ahead of time so that food is not wasted.

Thank you for your cooperation.

Appendix B

Student Participant Confidentiality Acknowledgement

Confidentiality is often very important to sponsor companies, who operate in a competitive marketplace. We want you to be aware of the College's responsibilities towards the sponsor about confidentiality and also to abide by the confidentiality agreement we have made with the sponsor. The technical legal language below comes from the College's confidentiality policy, and from the standard Letter of Understanding that the Computer Science Clinic Director signs with each clinic sponsor. (Note: Your sponsor may require more than is discussed here. Ask Your liaison.)

As a student participant, you understand that information that is received in connection with the performance under this project will be treated as confidential, and you will not disclose (outside the Clinic) any such confidential information without the express written authorization of the sponsor. You have reviewed a copy of our "Policy on Confidentialities". Sometimes the sponsor is willing, or even wants, to have your progress made public, for example over the web, but this should be cleared with your liaison in writing. It is also good practice to get your liaison's advance approval of the materials (slides etc.) you prepare for your presentations at HMC.

You further understand that all inventions, discoveries, and improvements made as a result of the research program shall belong to the sponsor, and any background information relating to such matters shall be made available to the sponsor upon request. (This means that the sponsor owns all the intellectual property generated by your project. You may not use any of it for your own purposes, or give it away to others, without written permission from the sponsor.)

The College does reserve the right to publish papers and reports concerning the research program in accordance with its publication policies. No such reports shall be published without the sponsor's approval within one year following the completion and delivery of the final report. After that year, the sponsor will be given an opportunity to review and comment on any proposed publication.

By signing below, you acknowledge agreement to cooperate in protecting the sponsor's interests in any inventions, and, upon request, to provide the sponsor with information necessary to perfect any claim the sponsor may have with respect to the ownership of such rights, including providing an assignment of all of the rights in and to any such invention.

Sponsor's name:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Name of Computer Science Clinic Project:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Your signature:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ Date:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Your name printed:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Appendix C

Computer Science Clinic Year-End Checklist

All items listed need to be given to the CS Clinic Coordinator in Olin B157, unless otherwise stated. These are the responsibility of the Project Manager, who may delegate. In addition, all teams must turn evaluation forms for each team member, including him/herself.

You will not graduate without compliance to these items. Acceptable alternate sign-offs are allowed by one of the following: your advisor, Prof. Liebeskind-Hadas, or Prof. Kuenning.

Project Manager's Name _____

Contact numbers after graduation, in case we have questions _____

_____

Project Name _____

Faculty Sign-Off   **Task**

_____   Team member evaluations.

_____   All materials (properly identified) given to the team by the project sponsor.

_____   Place all files for your project's CD-ROM in your team's directory on `knuth`: `clinic/`*`year`*`/sponsor`*`two-digit year`*`/cdrom`. See the Handbook for directory structure.

              Sign Off for CD-ROM IN THEIR RESPECTIVE DIRECTORIES:

              _____   Presentations

              _____   Statement of Work

              _____   Midyear Report

              _____   Final Report, as printed

              _____   Other documentation

              _____   Poster

              _____   Code (final release/build)

DruAnn Sign-Off   **Task**

_____   Books and other materials purchased with Clinic funds.

_____   Final meal receipts for reimbursement.

_____   Produce copies of final report, all copies printed, not copied, and double-sided, using the special Hammermill paper found under the printer on the 2nd Floor of Sprague. Send color pages to the printer named color-paper, which is physically located in Olin 1256. Number of copies needed should equal under of students on team plus under of liaisons plus 4 additional copies. of

_____   Project notebooks.

_____   Leave a post-it with your name on it on the machine you have been using.

_____   Perform final clean up of your area, including whiteboards. No not leave items lying around, including food items.

Appendix D

	Location	Extension
Computer Science Department		
Professor Geoff Kuenning, CS Clinic Director	Olin 1245	7-1610
DruAnn Thomas, Coordinator for CS, Math, and Global Clinics	Olin B157	1-8570
Professor Ran Libeskind-Hadas, CS Department Chair	Olin 1258A	1-8976
Joyce Greene, CS Dept. Administrative Assistant	Olin 1258	1-8225
Professor Zachary Dodds	Olin 1255	7-1813
Professor Mike Erlinger	Sprague 2nd Floor	1-8912
Professor Bob Keller	Olin 1253	1-8483
Professor Colleen Lewis	Olin 1241	7-0443
Professor Melissa O'Neill	Olin 1243	7-9661
Professor Chris Stone	Olin 1251	7-8975
Professor Elizabeth Sweedyk	Olin 1249	7-8360
Professor Ben Wiederman	Olin 1258	7-5330
Tim Buchheim, System Administrator	Beckman B101	7-3485
Clinic Workroom Sprague 2nd Floor	Sprague	
Glass Conference Room Sprague 2nd Floor	Sprague	77460
Beckman B100		7-1814
CS Terminal Room	Beckman 102	7-3442
FAX Machine	Olin 1258	607-8364
Computing and Information Services (CIS)		
Joseph Vaughan, Director	Parsons B150	1-8613
Help Desk	Parsons B148	7-7777
Audio Visual Services: Michael Meyka	Parsons B170	7-3498
Roger Wiechman, VMS System Manager	Parsons B160	7-4449
Andy Davenport, Network Manager	Parsons B164	7-4296
Engineering Clinic		
Professor Erik Spjut, Engineering Clinic Director	Parsons 2373A	7-1712
Lorena Gonzalez, Administrative Assistant, Engineering Clinic	Parsons 2373	1-8020
Global Clinic		
Professor Lisette de Pillis, Global Clinic Director	Olin 1257A	1-8975
Mathematics Clinic		
Professor Susan Martonosi, Mathematics Clinic Director	Olin 1277	7-0481
Physics Clinic		
Professor Richard Haskell, Physics Clinic Director	Keck 1243	7-2768
General Services		
Facilities & Maintenance: Theresa Potter, Platt Campus Center		7-2760