

# **CASL Report: Ideas to Improve Advising Systems at WPI**

April 2007

CASL Committee

Rick Brown (Chair), ECE

Philip Clay, Dean of Students

Mark Claypool, CS

Michelle Ephraim, HUA

George Heineman, CS

Tom Keil, PH

Rob Krueger, IGSD

Dale Snyder, Academic Advising

# 1 Introduction

WPI faculty members and the Committee on Academic Advising and Student Life (CASL) have long recognized the need to assess academic advising and make system-wide improvements. An electronic survey was developed and deployed to all undergraduate students from 2004-2006 to seek feedback on the advising relationship between the faculty advisor and the student. Unfortunately, student response rate was extremely low and the surveys were discontinued after the initial pilot period. Still concerned about the need to improve the academic advising system, CASL analyzed the advising system and concluded that one of the areas that needed the most improvement – with the greatest impact on advising from a faculty perspective – was in the access to student information.

## ***1.1 Current State of the Advising Information System***

Faculty advisors need a clear and efficient way to access and view up-to-date academic information about their advisees. They also needed a way to discern at a glance which advisees needed their attention and assistance the most. Currently, there are two methods for faculty advisors to access student advisee information: (1) Paper advising folders; or (2) Web information system.

Paper advising folders contain students' course schedules, academic transcripts and letters of academic status if appropriate. Faculty advisors are expected to keep advising folders up-to-date with the latest printed grade reports and notifications of students' academic standing, if appropriate. There may also be discussion notes from advisors' meetings in the folders as well. When a student changes advisors, the Academic Advising Office contacts the current advisor via e-mail, and the advisor is expected to forward the folder to the new advisor. Many have observed that maintaining paper student advising files is inefficient and time consuming for the advisor. Student information is often outdated or missing, and folders are commonly misplaced or lost in transit from one advisor to another. Moreover, advisors and advisees often communicate with each other via e-mail, which is not documented in the advisee folders.

Faculty advisors can also view advisee information through the Web information system. Advisors can view online their list of advisees with pictures, send e-mail to their advisees, review student transcripts, and generate degree evaluations. However, the advisor menu on the web information is cumbersome to use. Advisors wishing to view or run transcripts, course schedules or degree evaluations, must enter each student's ID individually for each specific report. This process is time consuming since many advisors have upwards of 25 advisees. The Web information system also does not identify for the advisor at a glance which students require attention (the advisor must review each advisee's grade report and/or academic status each term).

Both advisors and students report that the degree evaluations are limited in their usefulness because the audits only reflect students' academic progress toward their primary major. It does not allow students to track their academic progress in a second major or minor. Additionally, the advisor menu in the Web information system also does

not allow advisors to identify at a glance which advisees require their attention without the advisor reviewing every student's grade report and/or academic status each term.

An additional shortcoming of the existing Web information system is that there is no specific functionality to support graduate students. It is clear that supporting graduate students will require specialized capabilities because departments have different requirements for their graduate students. In addition, there will need to be different levels of support for Master's students and PhD students.

As a result of these inefficiencies and shortcomings in our current advising information system, advisors and students do not have the most accurate, timely information necessary to have a positive and effective advising relationship.

## 2 Electronic Advising Folders

WPI has made great strides in establishing an Information Technology (IT) foundation to server the administrative needs of faculty, staff, and students. Many services have been automated and enabled through a web-based interface. CASL believes there is an opportunity to apply IT to enhance the advising of WPI undergraduate students:

The existing Banner system has an increasing amount of up-to-date and accurate information about our students, such as their course schedules and grades. In fact, the online information is more relevant for a faculty advisor than the archival, printed records found in a faculty member's advising folder for a student.

Students are quite accustomed to using all forms of electronic communication (such as email, text messaging, or blogs). These technologies enable students to communicate easily and effectively with their peers. CASL believes the technologies can also empower students to take an increasing amount of responsibility for their education.

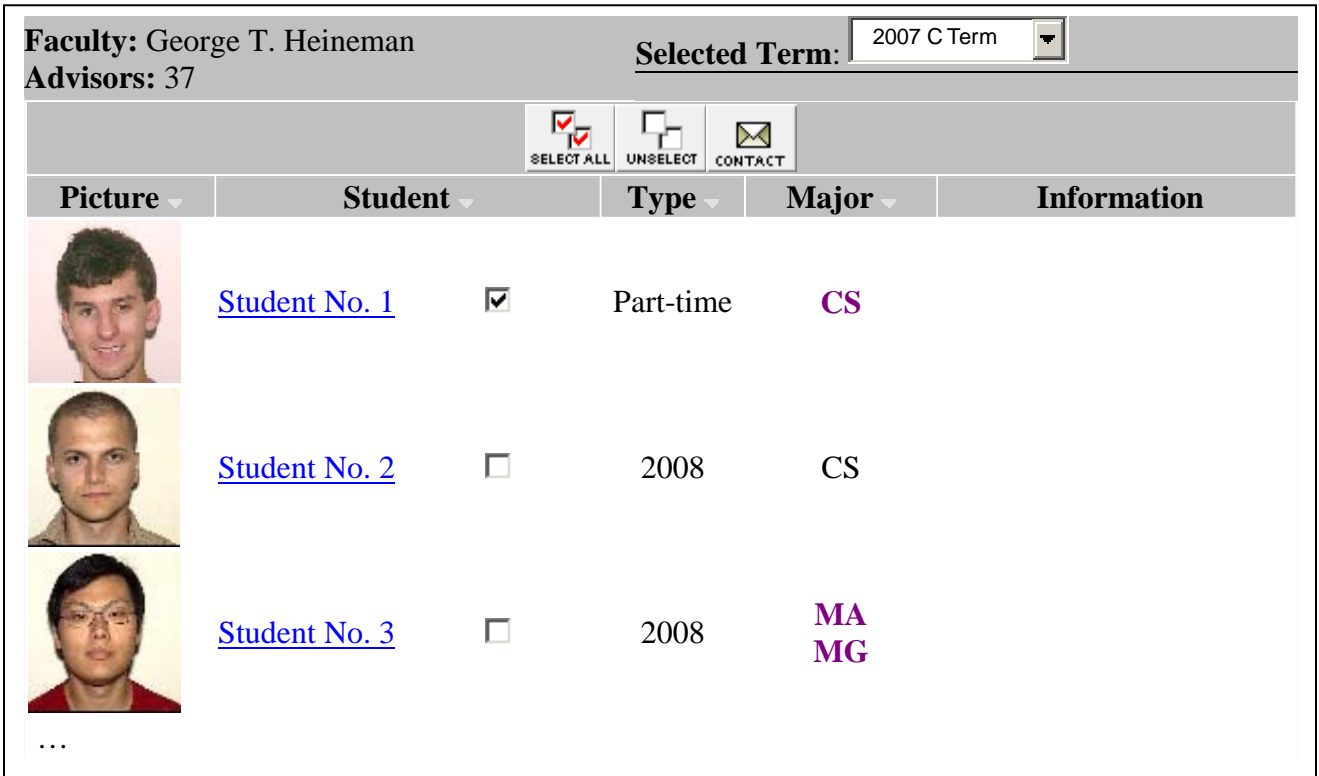
The academic lives of WPI undergraduates are much more complicated than they were a generation ago. There is also an upward trend of interdisciplinary behavior, such as double majors, special programs, minors, and projects involving student teams from multiple departments. Students will need, and seek out, advice not just from their faculty advisor, but also from other departments as well as the academic advising office.

We envision a single virtual space where faculty advisors, administrators, and student advisees can share advising information. We intend to create the metaphor of an *Electronic Advising Folder* that is both informative and interactive. This space will persistently store the advising interaction over the student's time at WPI. It will relieve both faculty and students from using email to communicate with each other – email that easily can be forgotten or deleted. It will integrate with existing IT systems (such as the Project & Registrar's office) to provide timely information about the student's current academic situation as well as plans for the future. It will enhance the experience of advising on campus.

## 2.1 Features and Interfaces

The images contained in this document represent proposed screenshots that users of the system would encounter. The technology that supports the proposed system is based on Web-based interaction and will be easy to deploy.




### 2.1.1 Main Faculty Dashboard Screen



**Faculty:** George T. Heineman      **Selected Term:** 2007 C Term

**Advisors:** 37

SELECT ALL   UNSELECT   CONTACT

Picture	Student	Type	Major	Information
	<a href="#">Student No. 1</a> <input checked="" type="checkbox"/>	Part-time	CS	
	<a href="#">Student No. 2</a> <input type="checkbox"/>	2008	CS	
	<a href="#">Student No. 3</a> <input type="checkbox"/>	2008	MA MG	
...				

**Figure 1: Faculty Dashboard:**

The Dashboard Screen shows “at a glance” all advisees for a faculty member with customizable information with glyphs (or icons) showing the status of the advisees for the given term. The screen is active (allowing one to sort by student name, type, or major). To “drill down” to review the Electronic Advising Folder for an individual student, the faculty advisor clicks on that student’s picture or name.

The right-most **Information** column can contain customized “views” to represent each student. For example:

- Show status events appropriate for the student (such as “NR PH1120”, “Placed on academic warning”, “Accepted into Bangkok IQP site”)
- Show the WPI school-wide requirements yet to be satisfied (i.e., SUFF, IQP, MQP, Social Science, Phys. Ed.)

## 2.1.2 Electronic Advising Folder Screen – Faculty Perspective

Student: **Earnest T. Lerner** [[email](#)] [[aim](#)] [[phone](#)]  
 Major: **Computer Science (CS)**  
 Year of Graduation: **2010**  
[WPI Distribution Requirements](#)

WPI Requirements	Minimum Units	Status
1. Humanities and Arts Sufficiency Project.	6	2
2. Interactive Qualifying Project	1	2/3
3. Social Sciences.	2/3	2/3
4. Residency Requirement	8	6
5. Physical Education	4/6	3/6
6. Minimum Academic Credit	15	13

[Computer Science Distribution Requirements](#)

Computer Science	Minimum Units	Status
1. Computer Science (including the MQP) (Notes 1, 2).	6	3
2. Mathematics (Notes 2, 3, 5).	7/3	7/3
3. Basic Science and/or Engineering Science (Notes 2, 4).	5/3	2/3

Analysis last run: Jan 27 00:39:51 2007

[Analyze Transcript](#) [Leave Note](#) [Contact Student](#) [Calculate Audit](#)

**Advising Discussion Area**

**Faculty post: November 30 2006**  
 Only if you take 3 courses within the core science set (BB/PH/CH) and 2 within the same discipline.

**Student post: November 28 2006**  
 Professor: I had a question regarding my sciences. Will ES1310 count towards the Basic Science Requirement? Also, I've attached a sample schedule you asked me to fill out  
 Schedule.doc (67,235 bytes)

**Automated post: November 26 2006**  
 A scheduled transcript analysis shows you are 60% done with the major requirements, while you have completed 30% of the school-wide WPI requirements. Please review the generated audit.

**Private Comments ...**

**Figure 2: Electronic Advising Folder Screen**

The Electronic Advising Folder presents the student advising information at a glance. Both school-wide WPI requirements and the individual student's Major requirements are shown. Hyperlinks connect to the undergraduate catalog (even the Notes within the requirements could be hyperlinked). The "Advising Discussion Area" contains a series of posted comments by the faculty advisor and student advisee. These comments record persistently the ongoing advising discussion and prevent important advising advice from being lost or simply forgotten. Automated comments can be posted here, too, from the registrar's IT system or through the intervention of the Academic Advising office. There is also a Private Comments area where the faculty advisor can keep notes that are not shared with either the student or the Academic Advising office.

The screenshot in Figure 2 above shows the perspective from the faculty advisor. Action buttons list the tasks that enable the Electronic Advising Folder to integrate with the

existing Banner-supported capabilities (such as analyzing a student’s transcript, for example).

### 2.1.3 Electronic Advising Folder – Student Perspective

**Student Virtual Folder**

Welcome, Chris!

You have 2 new messages from [Prof. Heineman](#).

You have 1 new message from the [Academic advising office](#).

■ In progress  
■ Completed  
■ Trouble

[Recalculate Audit](#)  
(last run: Jan 27 00:39:51 2007)

**WPI Distribution Requirements**

WPI Requirements	Minimum Units	Status
1. Humanities and Arts Sufficiency Project.	6	2
2. Interactive Qualifying Project	1	2/3
3. Social Sciences.	2/3	2/3
4. Residency Requirement	8	6
5. Physical Education	4/6	3/6
6. Minimum Academic Credit	15	13

**Computer Science Distribution Requirements**

Computer Science	Minimum Units	Status
1. Computer Science (including the MQP) (Notes <a href="#">1</a> , <a href="#">2</a> ).	6	3
2. Mathematics (Notes <a href="#">2</a> , <a href="#">3</a> , <a href="#">5</a> ).	7/3	7/3
3. Basic Science and/or Engineering Science (Notes <a href="#">2</a> , <a href="#">4</a> ).	5/3	2/3

Figure 3: Electronic Advising Folder – Student Perspective

Student advisees will see the same high-level assessment of their academic progress in the Electronic Folder. They will also be able to review all comments that have been left for them from a variety of people – including their advisor, the office of Academic Advising, and perhaps the Registrar as well.

Students will have access to their existing (and past) academic schedules. They will be able to prepare “four year plans” on-line. These plans are essential to enable students to take responsibility for their education. Because students must be able to consider alternatives, multiple plans can be stored. These plans can be analyzed against WPI graduation requirements through the existing Banner system.

The students can also access all required Forms (an increasing number of which can be filled out on-line). The folder becomes the persistent repository of the students academic

planning, replacing current *ad hoc* ways that students use to plan their schedules (paper, excel spreadsheets, etc...).

### 2.1.4 Electronic Advising Folder – Student Screens::Comments

Students should be able to view their past advising history through comments posted to the Electronic Advising Folder. The comments are sorted in reverse chronological order and represent the “historical record” of past advising. It is envisioned that the on-line comments will both personalize the interactions between advisor and advisee and serve as important reminders for past discussions and plans.

**Comments with Prof. Heineman**

Contact: [\[e-mail\]](#) [\[AIM\]](#) [555-1234] Office: FL 137

Advisor comment  
 Student comment

Subject:  [Insert schedule...](#)

**You are failing** - 10/21/2006

You're failing all of your courses. Please see me about this immediately.

**Why aren't you following your schedule?** - 8/27/2006

It has recently come to my attention that you aren't at all following the schedule we planned... why is this?!

**ok** - 8/10/2006

8/10/2006

OK teach, sounds good

**Here is a schedule you should follow** - 8/7/2006

I've lovingly created this delicately crafted schedule for you. Please follow it!

A term: CS1111  
 B term: CS1112  
 C term: CS1113  
 D term: CS1114

**Figure 4: Students can post comments**

The primary issues yet to be resolved are related to the access to these comments. Clearly, students should be able to view their own comments directed towards their advisor while advisors should similarly be able to view comments to students.

- *What happens when a student changes advisor?* Should the comments be visible to the new advisor? Should the comments be deleted?
- *Can a comment be kept private?* Can comments be hidden (temporarily or permanently) so they are seen only by the one who created the comment?

- *Do comments form part of the official education record?* Under current [FERPA guidelines](#), “parents or eligible students have the right to inspect and review the student’s education records maintained by the school”. Will these comments be part of the official education record? If so, they can be released under judicial subpoena.
- *Can comments be deleted?* Are comments immutable once they have been posted? Can the author of a comment edit its content at a later time, or delete it entirely?

### 2.1.5 Electronic Advising Folder – Student Screens::Schedules

Students should be able to create, manipulate, and delete four-year schedules to record their planned activities. Multiple schedules need to be stored, to allow students to explore multiple options for different majors or different off-campus opportunities. These schedules should allow for accurate registration information, when known, for future courses. It should be possible to perform degree evaluation computations against these schedules to provide useful information during advising.

[Create new schedule...](#)

#### 2008-09

[schedule #3 \(delete\)](#)

[schedule #2 \(delete\)](#)

#### 2007-08

[My sophomore schedule \(delete\)](#)

[My friend's sophomore schedule \(delete\)](#)

[Suggested sophomore schedule \(delete\)](#)

#### 2006-07

[Suggested by advisor \(delete\)](#)

**Figure 5: Student can create and store a variety of schedules**

Storing schedules within the Electronic Advising Folder is useful for multiple reasons: (1) students can readily share potential schedules with their advisees; (2) schedules can be built using specialized web-based tools rather than relying on students to use Notepad or MS Excel; (3) Departments could tap into the proposed schedules for future years as a (somewhat reliable) indicator of future class interest by students. This sort of information would be very useful to help schedule courses based on student interest.



**Four-year plan**

Completed
  In progress
  Planned

	2006-07	2007-08	2008-09	2009-10
<b>Use schedule:</b>	Suggested by Adv <input type="button" value="edit..."/>	My sophomore sch <input type="button" value="edit..."/>	schedule #3 <input type="button" value="edit..."/>	(None) <input type="button" value="edit..."/>
<b>A term</b>	MA1023 PH1111 MU2611	EE2011 EE2201 MA2611	EE3204 MU3613 MU3613	
<b>B term</b>	MA1024 PH1121 MU2611	CS3013 EE2311 ISP RGF	EE3801 EE3901 SUFF IQP	
<b>C term</b>	CS2223 PH1130 MA2201	CH1020 EE2111 EE2799	EE3803 PH2301 IQP	
<b>D term</b>	MA2051 PH1140	EE2312 MU2613 SS1310	MA2251 PH3501 IQP	

**Figure 6 Students should be able to view four-year schedule**

Given any four-year schedule, students should be able to view the schedule on a yearly and term-by-term basis. Also, students should be able to compare one schedule against another, as shown in Figure 6.

**2.1.6 Electronic Advising Folder – Student Screens::Forms**

Given that the Electronic Advising Folder aims to provide convenience to both the student and the advisor, it should be possible to link the Electronic Advising Folder to the numerous forms that are submitted by undergraduate students.

These forms (as shown in Figure 7) are printed and submitted by the student. Over time, an increasing number of these forms could be recorded on-line, with comments automatically inserted into the Electronic Advising Folder

## Forms for Students

Some of the forms on this page are online forms, to be completed online, while others must be printed out and returned to the Registrar's Office. **Forms in PDF, or Portable Document Format should be completed online, then printed out with the data neatly typed in the fields.** To use these forms, you must have Adobe Acrobat Reader® 4.0+ installed. This free software is available on the Academic Network and for download directly from the [Adobe Web site](#).



- | for Undergraduate Students  | for Graduate Students  |
|---|--|
| <ul style="list-style-type: none"> <li>◆ <b>Project Registration Forms</b> <ul style="list-style-type: none"> <li>◊ <a href="#">Sufficiency Registration Form</a> PDF File</li> <li>◊ <a href="#">IQP Registration Form</a> PDF File</li> <li>◊ <a href="#">MQP Registration Form</a> PDF File</li> </ul> </li> <li>◆ <b>Completion of Degree Requirements (CDRs)</b> <ul style="list-style-type: none"> <li>◊ <a href="#">Sufficiency CDR</a></li> <li>◊ <a href="#">IQP CDR</a></li> <li>◊ <a href="#">MQP CDR</a></li> </ul> </li> <li>◆ <a href="#">Application for Bachelor of Science Degree</a></li> <li>◆ <a href="#">Application for Readmission</a> PDF File</li> <li>◆ <a href="#">Application for Special Student (Part-Time) Status</a> PDF File <span style="background-color: yellow; border: 1px solid black; padding: 2px;">NEW</span></li> <li>◆ <a href="#">Combined Bachelor's/Master's Course Designation</a></li> <li>◆ <a href="#">Major/Minor/Concentration Change</a></li> </ul> | <ul style="list-style-type: none"> <li>◆ <b>Enrollment Forms</b> <ul style="list-style-type: none"> <li>◊ <a href="#">Fall &amp; Spring Registration Form</a> PDF File</li> <li>◊ <a href="#">Summer Registration Form</a> PDF File</li> <li>◊ <a href="#">Registration Deadlines</a></li> </ul> </li> <li>◆ <a href="#">Deferred Payment Plan Form</a></li> <li>◆ <a href="#">ETD Approval Form</a> PDF File</li> <li>◆ <a href="#">Graduate Student Application for Degree</a> PDF File</li> <li>◆ <a href="#">Request for Confidentiality</a> PDF File</li> <li>◆ <a href="#">Transcript Request Form</a> PDF File</li> <li>◆ <a href="#">Transfer Credit Authorization Form</a> PDF File</li> <li>◆ <a href="#">Voter Registration Form</a> PDF</li> </ul> |

Figure 7: Students can access forms relevant to their academic progress

## 2.2 How Electronic Advising could revolutionize advising at WPI

The Electronic Advising Folder project aims to modernize and increase the benefits that students and faculty members derive from advising. We identify a series of important benefits:

- Paperwork will be reduced
- Faculty advisors who leave campus for a term to oversee a project center will still be able to give advise to their advisees
- The Academic Advising office will no longer need to print the prodigious number of reports to be sent through the campus mail. The savings on this ground alone warrant moving forward with this project.
- Students will become actively engaged in the advising process. The increased interaction will shift some of the academic responsibilities from the faculty member to the student. The advisors will then be able to focus on the important advising questions (switching majors, course and project planning) rather than the often mundane bookkeeping requirements for graduation.

Faculty members are inundated with paperwork regarding student advisors. These forms appear several times a year, and record the increasing progress of all students.

Unfortunately, the forms must be **filed** by the faculty member into the student's physical folder (a task that often takes several hours depending upon the number of advisors a faculty member has!). All too often, the forms are filed and then never read again, until the Academic Advising Day each year; then the folders are put away once again.

Because of the numerous faculty involved in project centers, there are numerous cases where students can be "lost in the system" while they are between advisors. Faculty who wish to stay in touch with their advisees while they are away can now do so. By removing obstacles to interaction, the Electronic Advising Folder will increase the contact between students and faculty advisees.

The Academic Advising office carries out a number of tasks essential to the success of our undergraduate students. The office must assign advisees, monitor progress of first-year students, deal with major-change requests, and much more. The Electronic Advising Folder provides a persistent location where the Academic Advising office can access functionality on-line rather than using printed forms (which occasionally get lost). Students will be able to benefit from being more able to interact with the Advising office.

The primary aim of this project is to enable students to take charge of planning their undergraduate schedules. No longer will they be forced to store schedules in text files, or excel documents. They will be able to envision multiple scenarios – go to Bangkok for their IQP, take a co-op position, or minor in Computer Science – and use the IT infrastructure to judge how long it would take (or whether it is even possible). Through the Electronic Advising Folder, students will contact their faculty advisor more frequently, and the persistent storage of all exchanges will enable better benchmarking and long-term evaluation of their progress.

## ***2.3 Specific discussion of planned functionality***

### **2.3.1 Replace current physical folders**

The Electronic Advising Folder system would naturally eliminate the need for the existing system of student folders. By using an on-line site, instead of physical folders, faculty members are assured that they are seeing the most-recent, up-to-date information about a student. For example, during Academic Advising day each C term, the initial contact between a faculty member and the student advisee often starts by trying to identify the courses the student is registered for that C term!

If folders are removed, however, there needs to be some mechanism for the faculty member to make private notes regarding the student. In Figure 2, there is a "Private Comments" area that will store these comments. Only the faculty member can see (or delete) the comments. If the student switches to a new advisor, these comments are not transferred to that advisor, unless the old advisor expressly makes the comments public.

By removing the need to have a physical folder, this proposed system will enable faculty members to "check in" on their student advisees wherever or whenever they wish. For example, prior to Academic Advising day, most faculty members ask their advisees to

come to the meeting prepared with a schedule of proposed classes. Prior to the meeting, students could enter this information into the Electronic Advising Folder prior to the meeting, and the faculty member could review it there.

### **2.3.2 Improve information exchange between advisor and advisee**

Faculty advising only works if there is good communication between the faculty advisor and the student. If students only see their advisor once a year, the advising experience is unsatisfactory and unlikely to detect problems before they arise. One way to ensure interaction would be to mandate that students meet more frequently with their faculty advisors. We recommend, however, that a system be put into place to foster and encourage such communication naturally. Through the Electronic Advising Folder, students and faculty can communicate more effectively.

The predominant and persistent means of communication is through a Web log (known as a *blog*) of comments posted by both the student and faculty member. These are stored and sorted chronologically to present the progress of the student against past decisions. Too often, discussions in a meeting or through email can be lost and forgotten. The Electronic Advising Folder becomes a persistent memory of the advising advice and plans that students (and faculty) make. The Electronic Advising Folder also becomes a convenient repository for the information that is sent to the student from both the Registrar as well as the Academic Advising office.

### **2.3.3 Store four-year plans**

One of the challenges for advising is to empower students become responsible for their education. One mechanism used by faculty to engender this behavior is the four-year plan. As Dwight D. Eisenhower said, “Plans are nothing; planning is everything”. Through an on-line interface, students can create potential four-year plans, show them to their friends to compare their schedules, and evaluate whether their degree requirements will be met.

Because plans change, students need to be able to store a variety of four-year plans (such as an “ideal” plan, or a plan for double majoring). By storing the plans in the Electronic Advising Folder, the students can solicit comments from their faculty advisor. They can also have the existing Banner-driven system analyze the schedules against the degree requirements for their major.

### **2.3.4 Provide interactive ability to review groups of students**

A faculty member often has a number of distinct groups of advisees; quite often these are simply “first-year”, “sophomore”, “junior” and “senior”. One can also envision more abstract concepts: “have completed all projects”, “are double majoring”. The Electronic Advising Folder will enable faculty members to effectively aggregate and navigate through their advisees using a set of pre-configured customizations. The set of customizations can be extended with appropriate support from the WPI Information Technology department.

### **2.3.5 Enable “at a glance” views of students requiring attention**

In the dashboard screenshot of Figure 1, for example, the faculty advisee could see “at a glance” those students that require their attention. By using the customizable views, the faculty advisee can rapidly evaluate those students that they must contact.

For example, at the end of A term, if a first-year student has NR’d a course, the faculty advisor would like to hear about it and not wait until C term during Academic Advising day. The faculty advisor can enter the Electronic Advising Folder and select a view that shows which of their advisees have NR’d a course the past term (or past year). Armed with this information, faculty advisors can become more pro-active in identifying students that need help.

### **2.3.6 Enable advisor and advisees to contact each other easily**

The goal of the Electronic Advising Folder is to increase the communication between advisors and students. It is unlikely that the faculty member knows the email addresses for all of their advisees. The Electronic Advising Folder provides a “one stop” place where the faculty member can send an email to: (a) all advisees; (b) all first year student advisees; (c) all students who are coming back from an off-campus program; (d) all students that are going on probation.

In addition to these aggregate contacts, the Electronic Advising Folder contains the configured information about the best way to contact a student, such as a WPI email account, an off-campus email account, text messaging, or a call to a cell phone.

### **2.3.7 Allow students to schedule meetings on academic advising day**

The IGSD office has used an on-line scheduling program to manage the hundreds of interviews that take place on campus each Fall. This meeting system has also been used, on an individual basis, to schedule meeting times for Academic Advising Day. The Electronic Advising Folder can be integrated with this Meeting Scheduler program to enable faculty advisors to easily set up their meeting schedule for Academic Advising Day (and beyond, if the advisor has too many students for that single day).

## **2.4 Future Ideas**

### **2.4.1 Electronic Degree Evaluations**

The electronic degree evaluation is intended to be an automated tool that both students and their advisors can use to determine if a student is on track for graduation. Electronic degree evaluations at WPI, however, are currently useful for only a minority of the student body. Even in the simplest scenario of an undergraduate student with a single major, it is often the case that a degree evaluation will misclassify one or more courses under the heading of “Courses Not Used” when it is clear to both the student and the advisor that the courses can in fact be used to satisfy specific degree requirements. Inaccurate degree evaluations are often worse than none at all; they generate confusion and, in many cases, emergency advising meetings to ensure that a student is on track for graduation.

As a first step in improving the electronic degree evaluation, CASL recommends that the underlying logic of the degree evaluation be corrected to provide more accurate results for the body of “traditional” students, i.e. undergraduate students with a single major. A key assumption here is that WPI has unambiguous degree requirements and that these degree requirements can be mapped to logic that performs repeatable and accurate degree evaluations. If this is not the case, even for the relatively simple degree requirements of “traditional” students, then these ambiguities should be investigated. “Traditional” students and their advisors should be able to trust that electronic degree evaluations are accurate and should not have to hand-check the results. Moreover, it should be clear that the logic behind the degree evaluation considers the different assignments of courses to degree requirements and selects the assignment most beneficial to the student (as the student would do themselves).

A second step in improving the electronic degree evaluation would be to extend the functionality to a larger percentage of the student body including undergraduate students with minors and double majors as well as graduate students (including combined BS/MS students). Students in these categories are currently unable to use the electronic degree evaluation tools at all. The degree requirements for these students may be more complicated than the degree requirements of “traditional” students, but CASL believes that accurate and unambiguous degree evaluations should still be available to this large minority of the student body.

A third step in improving the electronic degree evaluation would be to allow students to use the degree evaluation for “what-if” planning. By this, we mean that students should be able to generate schedule plans, e.g. a four-year plan, that includes courses that they have already taken as well as courses that they plan to take. The electronic degree evaluation tool could be used with these schedules to determine whether the student's plan will satisfy the degree requirements. Students should be able to electronically save versions of their planned schedules to facilitate updates and continuous evaluation of their academic progress. Moreover, students considering a change of major, or the addition or a minor or second major, should also be able to evaluate the effect of these changes on their degree evaluation without commitment. Note that having students electronically submit schedule plans could have the ancillary benefit of dramatically improving the planning of course offerings at WPI.

Finally, CASL recommends that a formal feedback mechanism be created for degree evaluations to facilitate continuous improvement. Currently, no formal feedback mechanism exists. When students and/or advisors discover inaccuracies or ambiguities in electronic degree evaluations, they usually just ignore the electronic degree evaluation and perform a manual degree evaluation. Not only is confidence in the electronic degree evaluation eroded, but the opportunity for fixing the error is lost. A formal mechanism for feedback, preferably electronic and transparently built into the system, is necessary to ensure that the electronic degree evaluation tool remains relevant and useful to both students and advisors.

### **2.4.2 Online Degree Planning Tools**

Students should have the opportunity to generate and store, in their advising folder, four-year academic plans. There should be an option to check a plan with the degree evaluation tool so that students can know whether they are on track for graduation with a particular plan. For many students, multiple plans will need to be stored to compare alternate strategies and to investigate different majors. Students should have the ability to make a plan or plans visible to their academic advisor and to request comments.

If students were able to designate one of their four-year plans as the current one, the collective data from all students might be usable by department heads and others to plan the timing of course offerings to better match the desires of students.

It should be possible for a student to change majors or request a change in academic advisor online.

### **2.4.3 Advisor Automatic Notification System**

In the first few days of each Term, academic advisors should be automatically notified of advisees who are scheduled for either an underload (less than 3 courses) or an overload (more than 3 courses) to allow a timely determination of whether an advising issue exists. In a similar vein, immediately after a Term ends, advisors should be notified about students who have received NR's to facilitate advising for the next Term.

Ideally, academic advisors should be able to determine which events generate automatic notification and how notifications should be sent (e.g., email, flags in advising folders).

## **3 Improvements to course registration system**

While preparing this requirements document, several other related ideas were discussed and identified as future work outside of the scope of the Electronic Advising Folder. Most of the following topics are complicated because they require further interaction with existing systems from the Information Technology system.

### ***3.1 Ability to try options without commitment***

Ideally, a student could try out different course options in the process of registering, creating possible schedules without commitment. The student would ultimately be able to generate his/her schedule with a user-friendly interface that would resolve possible time conflicts.

### ***3.2 Ability to see all sections of a course simultaneously***

The current system does not allow students a comprehensive view of course options; rather, the student must navigate the system through a trial and error method. Bannerweb indicates if there is a class conflict but does not provide specific details about the problem. The student is left to determine the nature of the conflict on his/her own.

### **3.3 Smart scheduling (detect conflicts, suggest alternatives)**

An optimal system would both clearly show the courses that conflict and, subsequently, offer different scheduling options. Often this option would be in the form of an alternative section of the same course the student intends to take. This type of “smart” scheduling would help to prevent overloads as well.

### **3.4 Improve waitlist interface**

Students would also benefit greatly from improvements to the current waitlist interface. The interface does not provide clear information on the process for enrollment. Students, especially those new to WPI, may not understand how and when they are officially enrolled into the class. The student’s status on the waitlist is available on the page, but this information is visually difficult to discern. The interface would better serve students with the addition of specific explanations about how the waitlist works. Students are often uncertain about how to proceed once they have been waitlisted, especially regarding the process of notification and the timeline of when to register for alternative courses. Also, because of time delays in updating enrollment, courses may appear open that have already been filled (or are in the process of being filled) by waitlisted students.

### **3.5 Prevention of overloads if student is in IQP/MQP (advisor override)**

WPI in the past required all overload requests to be signed by the student’s academic advisor. Once the on-line registration system was in place, the system in place currently restricts on-line overloads until the beginning of the academic year. The on-line web site states “You must come into the Registrar's office and fill out a Course Change form. You will need to get the signature of your academic advisor on the form before submitting to the Registrar”. However, the Registrar has confirmed that students can sign up for an overload at the Registrar, apparently without the approval of their academic advisor.

The most pressing problem occurs when students sign up for overloads while currently working towards their IQP or MQP. The Registrar and the on-line system should prevent any such attempt to overload without signed forms from their academic advisor.

### **3.6 Allow grad students to sign up for research/thesis online**

An ideal web registration system would allow graduate students to enroll for research credit online. At the present time, graduate students have to send an email to the registrar or submit their request for credit in person.



## **Appendix I: Miscellaneous material for later integration**

Although CASL has not investigated the details of graduate student academic advising at WPI, it seems that the innovations suggested in this report should be implemented for graduate as well as undergraduate students.

## 4 Appendix II: Document Outline (DRB 20-Feb-2007: v0.2)

Short intro here stating purpose of this document, intended audience, and so on.

1. Current state of advising systems at WPI
  - 1.1. Description of how things currently work
  - 1.2. Identify shortcomings in functionality
  - 1.3. Identify interface problems
  - 1.4. Lack of advising systems for grad students
2. Electronic advising folders
  - 2.1. Features and interfaces
  - 2.2. How this could revolutionize advising at WPI
  - 2.3. Specific discussion of planned functionality
    - 2.3.1. Replacement of current physical folders
    - 2.3.2. Forum to exchange notes and information between advisor and advisee
    - 2.3.3. Store 4-year plans
    - 2.3.4. Customizable student dashboard to track degree progress
    - 2.3.5. Customizable faculty dashboard to quickly scan advisees and identify students requiring attention
    - 2.3.6. Buttons for easy contact between advisor and advisees
    - 2.3.7. Ability to schedule students for meetings on academic advising day
  - 2.4. Future ideas
    - 2.4.1. Improved degree evaluations
      - 2.4.1.1. Should be able to trust degree evaluations are accurate
      - 2.4.1.2. Minors
      - 2.4.1.3. Double majors
      - 2.4.1.4. Graduate students (including combined BS/MS)
      - 2.4.1.5. Ability to evaluate "what-if" plans
      - 2.4.1.6. Ability to evaluate change of major without commitment
    - 2.4.2. Interface improvements
      - 2.4.2.1. Appearance
      - 2.4.2.2. User-friendliness
    - 2.4.3. Online degree planning tools
      - 2.4.3.1. Ability for undergrads to generate and store 4-year plans (with degree evaluation)
      - 2.4.3.2. Ability to change majors online
      - 2.4.3.3. Tools for grad students too?
      - 2.4.3.4. Could facilitate course planning?
    - 2.4.4. Advisor automatic notification system
      - 2.4.4.1. Example: students get NRs
      - 2.4.4.2. Example: students overload/underload
      - 2.4.4.3. Allow advisors to select events which generate notifications (and how notifications should be sent)
    - 2.4.5. For both undergrads and grads?
3. Improvements to course registration systems
  - 3.1. Ability to try options without commitment
  - 3.2. Ability to see all sections of a course simultaneously
  - 3.3. Smart scheduling (detect conflicts, suggest alternatives, ...)
  - 3.4. Improve waitlist interface
  - 3.5. Prevention of overloads if student is in IQP/MQP (advisor override)
  - 3.6. Allow grad students to sign up for research/thesis online