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Chapter 1

Quick Tour of MAPPER

Let’s take a quick tour of some of the screens you may see in MAPPER.

1.1 Logging In

The login credentials are your normal CES NetID and password.
CHAPTER 1. QUICK TOUR OF MAPPER

1.2 Login Assistance

New users may not be in the database yet. If you attempt to log in a few times and it is just not working, try the login assistance page. It will send a message to a human that can intervene to help you.

1.3 Reporting Bugs

For better handling and tracking, limit each report to a single topic. If you have several ideas, it is much better to submit several bug reports, with one idea mentioned in each. Please be as specific as possible. Messages like 'the user interface needs improvement' may be true but do not give enough guidance. When possible, paste in exact copies of error messages or text from the broken page to help us quickly find and fix the problem.

We find that some bugs and feature requests are very easy to fix. Others may have complex interactions that make them quite difficult. When you fill in what you see broken, please include:
Sometimes things are not working smoothly. You may want to make a suggestion or point out something that is obviously wrong but nobody fixed it yet.

1.4 Seeing Your Map

This is what most students see. This is what you as an administrative user can also see about each student.
Chapter 2

Tour of the Administrative Menu

If you have administrative rights, this is the screen you will see right after you log in. It gives many commonly used options.
2.1 Projected Roll Sheets

Projected Roll Sheets tells you who (a) has already signed up for your class, and (b) said they are planning to sign up for your class.

Rolls also has an option to see all future sign-ups for this course. When enrollments are running low and you need to drop back to teaching a class once a year, this can help you decide which semester works best for the most students.

Rolls also has an option to see who could benefit from taking your class. By this we mean it would advance them in one of the academic programs they have selected.

Rolls also has an option to see what prerequisites might be missing for each student.

2.2 Course Descriptions
CHAPTER 2. TOUR OF THE ADMINISTRATIVE MENU

MAPPER uses information from the registrar’s database (PeopleSoft) to know the characteristics of classes including their titles and course descriptions.

Because some of this information is difficult to access and interpret, MAPPER also maintains its own version of some of this information, including the course title, number of credits, whether the class can be repeated for credit, and whether the class has been discontinued. Further it lists prerequisites and the teaching forecast. All of these things may be available from the registrar, but they are also stored here for convenient access.

2.3 Room Utilization

Looking for a room to teach in? Or you have a room in mind but you cannot tell whether someone else is using it at the time you want? This menu item lets you see what the room will be used for during the semester.

As a bonus, when you print the results they are suitable for posting near the door of the room to give people guidance on whether a class is in session or the room is empty.
2.4 Graduation Projections

The Grad option lets you find out which students are ending their studies on any particular date.

2.5 Majors

What are the requirements for each major? Which students are enrolled in the major?
2.6 Teachers

Who is teaching, and what are they teaching? Search here.

2.7 Staff

Who is a student, faculty, staff member, or administrator at BYU Hawaii? Key in the information that you know and we will search the campus directory for matching people.
Chapter 2. Tour of the Administrative Menu

2.8 Recent Retrievals

Often you may want to review the list of students that you worked with over the past day. This shows you when and who.
Chapter 3

Introduction

3.1 Data To Do Your Job

You need data to make good decisions. Without it you can only guess. MAPPER gives it to you.

Data is vital to the life of today’s university. Grades and transcripts are the tip of the iceberg.

PeopleSoft is the data warehouse that powers the university in much the same way that filing cabinets and archives did in the past. PeopleSoft maintains the academic history of each student, including grades and transcripts. This foundation allows us to grant degrees and make payroll. PeopleSoft is the record of what WAS and IS. PeopleSoft is history. PeopleSoft is bedrock.

MAPPER is the prediction of what WILL BE. MAPPER is capacity planning. MAPPER is course expectations and intentions. MAPPER is things that will happen and things that may not happen.

Specifically, MAPPER is a computerized aid to the human process of academic planning and advisement. Students indicate their future plans and receive advice about prerequisites and when classes will be taught. Faculty specify course prerequisites and indicate the schedule of future offerings. Problems are avoided. This leads to fewer independent study requests and better estimation of enrollments. Problem students are more easily identified, as are top students (scholarship candidates).

The name MAPPER comes from M.A.P., the BYU Hawaii acronym for Ma-
CHAPTER 3. INTRODUCTION

Major Academic Plan. MAPs were also called four-year plans. They consisted of the list of courses, semester by semester and term by term, that individual students were advised or expected to take. MAPs were prepared with the assistance of a trained academic advisor and took into account the prerequisite structure and the course offering frequency. MAPs were initially done with pencil on paper and secured in locked filing cabinets. They provided a proof-of-concept analysis on a per student basis showing that the student could take classes according to a plan and fulfill the requirements for graduation in a timely manner. But all too often the MAPs were not followed or kept up to date until the student applied for graduation. This resulted in last-minute adjustments and exceptions and requests for independent study.

MAPPER is a web-based program for capturing student MAPs and doing analysis to answer related questions. It makes the data available as needed to faculty and others. It also serves many of the routine functions of the academic advisor, including prerequisite awareness and course offering frequency awareness. To a great degree MAPPER frees up the academic advisor to focus on the many exceptional situations with which they must deal.

The URL for MAPPER is http://mapper.byuh.edu/

3.2 Parts of This Document

This document is organized into chapters matching different levels of administrative access.

User is the non-administrative level. It gives the ability to request administrative access. All students and other users have this ability. Login access is controlled by the BYUH LDAP system discussed below.

All administrative users (including everyone other than individual users) are required to have proper FERPA training.

FERPA is the Family Education Rights and Privacy Act. It states that confidential academic information, such as grades, must be controlled and disclosure limited. MAPPER deals with student grades and therefore falls under FERPA requirements.

MAP View is the basic administrative access level. It gives the ability to see student MAPs and student grades. It does not give the ability to make changes. (For occasional changes to data, ask your academic advisor
CHAPTER 3. INTRODUCTION

or department chair to do it. If you routinely need to update data, ask for greater access rights.)

**Faculty Advisor** is the second level of administrative access. It adds the ability to modify and print student maps, but not the ability to save them.

**Faculty Chair** is the third level of administrative access. It adds the ability to modify course information, including the title, prerequisites, and offerings calendar (in which semester or term the course is planned to be offered). Generally this is a department chair, department secretary, or program lead.

**Advisor Assistant** is the fourth level of administrative access. It adds the ability to insert advisor comments into the MAP and to change and save the MAP. Generally this is a student worker.

**Academic Advisor** is the top level of administrative access. It adds the ability to approve MAPs and grant rights to others.

The chapters of this manual address questions that can be answered at various levels of access.

### 3.3 Why MAPPER Exists

One of my earliest frustrations as a department chair was finding two sections of a class each half filled when I really could have used that teacher elsewhere for at least one of those times. The explanation given to me was that we have always run two sections of that class. (Currently we always run one section.)

Another frustration was the first-week flow of students with class conflicts, often conflicts that I had caused by scheduling the two classes they needed at exactly the same time. How was I to know?

And another frustration was the final-semester flow of students with their requests to take a capstone class before finishing the prerequisites because otherwise they would be here another semester just to take one class.

In my case, frequently I ended up approving Independent Study situations and waiving prerequisites to get students through the system.

Been there, done that?

These favors come at a cost, both to faculty and to students. Each independent study represents work for the teacher far out of proportion to the credit
generated. And each waived prerequisite represents a drag on the ability of the whole class to move forward at a proper pace to complete the material within the semester.

Academic advisors work with students to help them plan their future courses. These plans get written up and filed away. They are called Major Academic Plans, or MAPs. Sometimes these MAPs are data mined for information about who plans to take a particular class next semester. Often MAPs are reviewed in post-mortem with students looking to extend their graduation. But largely MAPs have been inaccessible to faculty. What if that information were available?

MAPPER is a computer software project that was designed to capture these MAPs in a way that can answer the following types of questions:

Question: How many students should I expect for (name a course)?
Question: What if I schedule these two courses at the same time?
Question: If I offer this elective, who could take it?
Question: Which students are avoiding important classes?
Question: What students are failing to make satisfactory progress toward graduation?

3.4 My History with MAPPER

MAPPER is my response to twenty years of banging my head against the wall. From 1988 to 1993 I was chairman of the Computer Programming department at Griffin College in Seattle, Washington. We had a small student body and a small faculty. It was crucial to plan course offerings carefully. In 1990 I developed a software package that I called RADE. It was a precursor to MAPPER.

In 1997 I joined the faculty at BYU Hawaii as an assistant professor of Computer Science. Immediately I noticed that many students were declared as majors in CS but were not taking the right classes to help them graduate. I started work on the analysis portions of what would become MAPPER.

In mid 2001 I became chairman of the Computer Science department. I was then successively the chair of Computer Science, chair of Information Systems, and chair of Computer and Information Sciences until late 2008 when I became associate Dean of my college.
MAPPER was first deployed in the BYUH Computer Science department in 1998. When the School of Computing was created in 2002, it was expanded to cover Information Systems and Mathematics. By 2004 it was expanded to cover all majors on campus, but without good support. The School of Business started using MAPPER in about 2006. During the summer of 2008, the academic advisors across campus adopted MAPPER as a tool for organizing their student information and a way to make it easier for them to advise each other’s students as needed. By August 2008 nearly all student MAPs were online.
Chapter 4

All Users

**User** is the non-administrative level. It gives the ability to request administrative access. All students and other users have this ability. Login access is controlled by the BYUH LDAP system.

### 4.1 Using MAPPER

MAPPER is at [http://mapper.byuh.edu/](http://mapper.byuh.edu/)

Alternately, you can go to the BYUH home page and type MAPPER in the search bar.

From the MAPPER homepage, all users (students, faculty, and academic advisors) log in using their CES Network Identifier. This CES Net Id is also used across campus to allow users to log into the campus computer network and can be used as an email address for most people.

After logging in, persons without administrative rights are taken directly to their personal MAP. On this page, they can enter the courses they plan to take and they can see what problems exist with their schedule. There is an [Admin?] button they can press to request administrative rights. At present the granting of administrative rights can be done by any Academic Advisor.

Persons with administrative rights are taken to an administrative menu page that shows existing options. Options for which the user does not have rights are normally grayed out or not shown.
4.2 Bug Report

There is a Bug Report facility. MAPPER has benefitted from the efforts of many people, especially the academic advisors and early adopter department chairs. But as is widely recognized, all non-trivial software contains bugs. MAPPER is no different. And all non-trivial software could be improved. MAPPER is no different.

As you use MAPPER, if you think of an improvement that would benefit yourself and possibly other people, please suggest it. Nearly every screen has a [Bug?] button that will take you to a place where you can report your thoughts.

Some bugs and features are easily completed. Others are deceptively difficult. Often it is hard to tell them apart until you try to satisfy them. Send in your thoughts and let us decide whether they can be integrated easily or must wait for a future major release. But in any case, thank you for using MAPPER and thereby making it stronger.

4.3 User-level Access

A separate document, “Student Guide to MAPPER,” goes into detail on the options typically available to students. It also gives advice on creating a good Major Academic Plan.
Briefly, students are taken to the MAP that was most recently saved. They are allowed to change classes among their future plans. They can save their work. They can go to a history of saved files to reload work from a previous session, thus giving them the ability to store several versions of their MAP. But most importantly they can see the potential problems that may come up, including prerequisites planned out of order, required classes still to be planned, and courses planned for semesters when the faculty have not said they will be offered.

With user-level access you can see and modify your own MAP. You can see your grades. You can specify the courses you plan to take in future semesters and terms. You can save your work.

With user-level access you can play the “what if” game. You can pretend to add another major or change majors so you can consider how that might affect your choice of future classes. Or add a minor.

Red highlights on your MAP indicate potential problems. The most common problems are missing prerequisites and classes that will not be offered. In each case you should consult with a human, typically your academic advisor but possibly a faculty advisor, to see whether the problem is real. You should generally assume the problem IS real unless you can confirm otherwise.

MAPPER is a tool for planning and decision making. MAPPER bases its judgments on information provided by departments and students. Departments tell when they will offer classes and what the prerequisites are. Students tell when they will take classes. Both are free to change their minds. Both can see what the other is saying.

Please see the separate Student’s Guide to MAPPER 2.0 for more information on the student view of MAPPER and academic planning.
4.4 Logging In

When a student applies for admission to BYUH he or she creates a network ID, also called the CES Net ID because it is used across all institutions of the CES (Church Education System). At the same time he or she creates a password and specifies a preferred email address.

In conjunction with being admitted to study at BYUH, or in conjunction with becoming employed at BYUH, each person is assigned a seven-digit ID number.

When the person is an active student or employee on campus, they are also added to the login directory system, called LDAP. The LDAP system (lightweight directory access protocol) provides the primary basis for validation of user names and passwords at the university.

Once you have a seven-digit ID you should be able to log into MAPPER. If you are in LDAP you can use your normal password. If not you can request Login Assist from an academic advisor.

Each time you log into MAPPER, you will provide your username and password. At BYUH your CES Net ID is your username.

MAPPER will look up your username in its internal records. Since you are new, it will not find you yet. It will then ask LDAP to validate your credentials (your username and password). Failing that you will receive a message to check your CAPS-LOCK and try your password again.
If LDAP is successful, MAPPER stores an encrypted copy of your password for future logins. It also requests your transcript from the PeopleSoft database system. It adds information about you to its internal tables. There may already be information about you in those tables if you have signed up for any classes.

On your second and subsequent logins, MAPPER looks for your username and finds that it already knows you. It then compares your password with the encrypted version it kept from before. If they match, you are logged in. If not, MAPPER consults LDAP to see if the new password is recognized. If it is recognized, MAPPER updates its own copy and grants you access.

4.5 Not In LDAP

Some students and new faculty are not present in the LDAP system when they first need access to MAPPER. This can include students returning from missions. Using “Login Assist” any Academic Advisor can grant you a temporary password. This password can be used until the LDAP system is able to validate you.

4.6 Password Encryption

The encrypted password that MAPPER stores cannot be reversed to find out the original password. Instead, to verify that your password matches, the new password is encrypted and the result is compared.

Local passwords serve three purposes. (1) It reduces the computing load on the LDAP system. (2) It allows access even when the LDAP system is down. Although that should never happen, in actual practice it does from time to time. (3) It provides a convenient method for supporting Login Assist for persons not in LDAP.
Chapter 5

MAP View

MAP View is the basic administrative access level. It gives the ability to see student MAPs and student grades. It does not give the ability to make changes. (For occasional changes to data, ask your academic advisor or department chair to do it. If you routinely need to update data, ask for greater access rights.)

MAP View users can research and follow up on the following kinds of questions.

How many students will be in my class next semester?
Which students did not complete the prerequisites?
How can I contact a group of students?
What other students can I seek to add my class?
A student is asking me to be their Faculty Mentor. How can I find out about their academic performance to date?

5.1 Crs Stu (Rolls)

The [Crs Stu] button activates the “Course Students” search page. It tells who is taking or planning to take certain courses. It provides a Capacity Plan and a Conflict Matrix.

Faculty can specify a semester and a list of course prefixes. Active student MAPs will be reviewed to see what is planned in that term. (Discontin-
ued students are not included. Completed students are not included.) All courses that match those prefixes will be tallied.

5.1.1 Course Prefix

A prefix is simply the first characters of the course designator. For math221, the normal prefix is math, but the following are all prefixes of math221: m, ma, mat, math, math2, math22, math221.

By searching on math, all courses that start with math are listed. By searching on hist20, all classes that start with hist20 are listed.

To search for all classes in the university, key in the letters of the alphabet, one by one, separated by spaces.

5.1.2 Semester Numbers

Semesters are indicated using the four-digit PeopleSoft codes adopted at BYUH. These codes are formed by dropping the second digit of the year and adding a digit for the semester or term. Before 2009, the terms were 1=Winter, 3=Spring, 4=Summer, and 5=Fall. Starting 2009 the terms are 1=Winter, 2=Spring, 3=Summer, 4=First, and 5=Fall.

Thus, Fall 2007 would be coded as 2075. Spring of 2010 would be 2102.

5.1.3 Other Options

You can enter a list of courses to be ignored.

[x] include registered students: For each course we will list the students who have actually registered for the course. By default this is turned on. Turn this off to just see the MAP-only students.

[x] include map-only students: For each course we will list the students who have listed this course on their MAP. By default this is turned on. Turn this off to just see registered students.

[x] include conflict details: For each pair of courses we will list the students that are planning on taking both of them. We will also build a triangular matrix showing all courses and the amount of conflict between them. By default this is turned on. Turn this off to avoid the extra cal-
culations and display of conflict information, which can sometimes be quite wide.

[ ] checkmark all: For each student listed, set the checkmark to be on. This is in preparation to going to the [Merge] screen or the [Lists] screen. By default this is turned off.

[Classes]: When all the options have been set to your satisfaction, press Enter or click on the [Classes] button at the top of the screen. This causes MAPPER to execute your search request and report the results.

Results include two triangular conflict matrices, lists of students for each class, and lists of students for each pair of classes. These pair-wise lists are important for avoiding schedule conflicts for small classes but can usually be ignored for larger courses where multiple sections are offered at varying times.

Each conflict matrix is organized like a mileage chart often seen on older road maps. The diagonal lists the courses and gives the estimated enrollment for each course. The intersections give the number of students that overlap between the two classes. By clicking on any number in the matrix you are taken directly to the list of students involved.

5.2 Crs Dat

The [Crs Dat] button activates the “Course Data” page. Its focus is on data about courses themselves and not the students who might be taking them. Specifically it manages information about the terms that courses are offered (the course rotation or course forecast), the number of credits typically involved now and in the future, the prerequisites, and the display title.

MAP View users can see this information but cannot change it. Department Chair or higher rights are required to make changes.

This section allows everyone to see what semesters each course is planned, so far as MAPPER has been made aware. Those with rights can change that information. Faculty should typically print off a list of the courses offered by the department and mark it up with corrections for updating by the Academic Advisor.

Each course is listed with a forecast of when it will be offered. The forecast
is based on a two-year repeating cycle. Each class can be offered in any of these ten slots: Even First, Fall, Winter, Spring, Summer, Odd First, Fall, Winter, Spring, and Summer.

As the forecast is changed, students are immediately able to see problems in their future plans as well as opportunities to take classes that they had planned for later.

Each course is also listed with a set of prerequisites. The prerequisites are grouped such that one class from each group must be taken before the prerequisites are considered to be satisfied. For example:

\{math106 \text{ math110}\} \{math221 \text{ math321 soc205 psyc205}\}

The above prerequisite specification requires the student to complete either math106 or math110 before taking the follow-on course. Also, the student must complete statistics which is regarded as being any one of these four courses: math221, math321, soc205, and psyc205.

In each \{\} group, the first course mentioned will be the one recommended to the student unless another course on the list was planned or taken. Therefore, list the most common choice first.

5.3 Majors

The [Majors] button activates the “Majors” page. Its focus is on major programs and the students enrolled in them. It is also the front door into the Major Requirements Sheets (MRS) which specify the degree requirements for each major.

Graduation requirements are organized by Major Plan. A large number of Plan codes exist. For example, COMPSCIBS is the code for a BS in Computer Science. ACCTBS is the code for a BS in Accounting. For convenience, each plan can be listed on one or more departments. For example, MATHEDBS might be listed under MATH and under EDU.

Within a plan, requirements may vary from year to year. These specific requirements are written up as a Major Requirements Sheet (MRS). Essentially the MRS is a list of requirements, each of which must be satisfied for the student to graduate.

A requirement (for MAPPER) is specified as a number of credits that must be earned together with a list of courses that can satisfy that requirement.
CHAPTER 5. MAP VIEW

For example, the MRS may indicate a requirement to take 3 credits of Statistics. Normally that would be accomplished by taking MATH 221. However, the department may be willing to accept MATH 321 instead, or PSYC 205, or SOC 205. The requirement line would list all those options as follows.

"Statistics" 3 math221 math321 psyc205 soc205

Major Requirements Sheets can be viewed by all persons with administrative rights. Those with special rights can update the MRS sheets. This would most likely happen when a new class is recognized as acceptable in fulfilling an existing requirement. It could also happen if a required class is renumbered or renamed.

An entirely new MRS sheet can also be created. It is generally easiest to set up a new MRS sheet by making a copy (cut and paste) from an existing sheet. Generally this should only be attempted by Academic Advisors.

5.4 Find

Imagine a student has just come to your door. They want you to sign their Contract of Understanding as a faculty advisor. But you don’t know them from Adam.

One approach is to key their name (or email address or student ID number) into the blank and press the [Find] button. Matching students will be identified. You can click through on the correct student to see their map, complete with grades.

This should enable you to understand the big picture better.

5.5 Hotlist

A [Remember] button appears on each student’s MAP. You can key in a memo to yourself and press the [Remember] button to put that student on your hot list. The hot list is just a faster way to go directly to students of interest to you. This might include the students for whom you have signed on as faculty advisor.

Later you can click the [UnRemember] button on that student to remove them from your hot list.
To change the memo, press [UnRemember], type in a new memo, and press [Remember] again.

Your hot list can contain as many students as you wish. It will be displayed in order by the most recently used MAP. Clicking through on any hot listed map moves it to the top of the hot list.

5.6 MMerge

MAPPER provides a Mail Merge capability. Most screens that give lists of students also provide a way to select students for a mailing. For example, you may want to request the students with the worst progress to come see you.

For each mailing, you can designate persons to be on the CC line as well as persons to be on the BCC line. Only one student at a time will appear on the TO line. If several students are selected, each email will be generated and sent separately so the students never see each other’s names.

The Mail Merge function also allows you to insert mail merge variables into your message. There are codes for FirstName, LastName, GPA, ID number, and other things. These can be handy pieces of context as part of your paper trail when dealing with potential problems.

5.7 Progress (Repeats)

Satisfactory progress can be measured in different ways. Generally we recognize a form of progress based on Grade Point Average (GPA) and we expect students to have a Term GPA (TGPA) of 2.0 or better as well as a Cumulative GPA (CGPA) of 2.0 or better. Students that fall below this line are put on Grade Warning, Grade Probation, or Grade Suspension.

But there is another form of progress: Academic Progress. This is not well defined in the general case, but is broadly defined as being on track to complete the major in a timely way.
5.7.1 Major Progress Ratio

MAPPER offers assistance in making that assessment. The metric for comparing academic progress is Major Progress Ratio (MPR). Students with a high Major Progress Ratio over 100 are completing their major coursework faster than they are completing their degree as a whole, meaning the 120 credits required for graduation. A student with an MPR of 50 would be expected to complete about half of his major by the time he had earned 120 credits overall. That would probably be a problem.

Students with a low Major Progress Ratio may not be making satisfactory academic progress. MAPPER makes it easy for you to identify such students. You can then conduct your own case by case review to see which should receive formal sanctions.

5.7.2 Projected Repeats

MAPPER also computes statistics based on Major Course Repeats. A Major Course is defined as a class required in that major, whether or not it has the usual prefix. The Computer Science major requires certain mathematics classes so they would be considered major courses for a CS student. Based on the options and requirements listed on the Major Requirements Sheet (MRS) and the plans and accomplishments of the student in question, a list of major courses is drawn up for each student.

For each course on that list it is expected that the student will earn a grade of C- or better. Any grade below that is counted as a repeat, even if the repeat has not actually taken place, and even though a limited number of D grades may be allowed. To some extent this oversimplifies reality, but in borderline cases a human can refine the analysis.

We can compare the number of courses required to the number of courses completed and the number of retakes caused. This can give us statistics such as the Actual Repeats number and the Projected Repeats number. For students with repeats but still no courses successfully completed, the projected repeats number is capped at 99.

Students with a high number of projected repeats may not be making satisfactory academic progress. MAPPER makes it easy for you to identify such students. You can then conduct your own case by case review to see which should receive formal sanctions.
Chapter 6

Faculty Advisor

Faculty Advisor is the second level of administrative access. It adds the ability to modify and print student maps, but not the ability to save them.

Faculty Advisor users can research and follow up on the following kinds of questions.

Unprepared: Review students enrolled in a class to find out who is prepared and who should not be there. Condition expectations so you will not have to do so many independent study classes.

Recruit: Find students to fill seats in an advanced class. Look for students who are still around and who have the necessary preparation to be successful in the class.

Contact: Send email to my current students or any other group of students I can define.

Advise: Review student progress for an individual student currently sitting in my office. Handle those Contract of Understanding situations.
Chapter 7

Faculty Chair

Faculty Chair is the third level of administrative access. It adds the ability to modify course information, including the title, prerequisites, and offerings calendar (in which semester or term the course is planned to be offered).
Chapter 8

Advisor Assistant

Advisor Assistant is the fourth level of administrative access. It adds the ability to advisor insert comments into the MAP and to change and save the MAP.
Chapter 9

Academic Advisor

Academic Advisor is the top level of administrative access. It adds the ability to approve MAPs and grant rights to others.
Chapter 10

Root Access

As with all computer systems, a root level of access is provided for maintenance. Root access includes access to all capabilities of the MAPPER system.
Chapter 11

Old Stuff

11.1 Introduction

One of my earliest frustrations as a department chair was finding two sections of a class each half filled when I really could have used that teacher elsewhere for at least one of those times.

Another frustration was the first-week flow of students with class conflicts, often conflicts that I had caused by scheduling the two classes they needed at exactly the same time.

And another frustration was the final-semester flow of students with their requests to take a capstone class before finishing the prerequisites because otherwise they would be here another semester just to take one class.

In my case, frequently I ended up approving Independent Study situations and waiving prerequisites to get students through the system.

Been there, done that?

These favors come at a cost, both to faculty and to students. Each independent study represents work for the teacher far out of proportion to the credit generated. And each waived prerequisite represents a drag on the ability of the whole class to move forward at a proper pace to complete the material within the semester.

Academic advisors work with students to help them plan their future courses. These plans get written up and filed away. They are called Major Academic Plans, or MAPs. Sometimes these MAPs are data mined for information
about who plans to take a particular class next semester. Often MAPs are reviewed in post-mortem with students looking to extend their graduation. But largely MAPs are inaccessible to faculty. What if that information were available?

MAPPER is a computer software project that was designed to capture these MAPs in a way that can answer the following types of questions:

Question: How many students should I expect for (name a course)?
Question: What if I schedule these two courses at the same time?
Question: If I offer this elective, who could take it?
Question: Which students are avoiding important classes?
Question: What students are failing to make satisfactory progress toward graduation?

11.2 Implementation

MAPPER is a web-based program for capturing student MAPs and doing analysis to answer related questions.

The URL is http://mapper.byuh.edu/

A predecessor to MAPPER named RADE was developed in 1990 for use in the Computer Programming department at Griffin College in Seattle.

MAPPER was first deployed in the BYUH Computer Science department in 1998. When the School of Computing was created in 2002, it was expanded to cover Information Systems and Mathematics. By 2004 it was expanded to cover all majors on campus, but without good support. The School of Business started using MAPPER in about 2006. During the summer of 2008, the academic advisors across campus adopted MAPPER as a tool for organizing their student information and a way to make it easier for them to advise each other’s students as needed. By August 2008 all student MAPs will be online.

11.3 Using MAPPER

From the MAPPER homepage, all users (students, faculty, and academic advisors) log in using their CES Network Identifier. This CES NetId is also
used across campus to allow users to log into the campus computer network and can be used as an email address for most people.

After logging in, persons without administrative rights are taken directly to their personal MAP. On this page, they can enter the courses they plan to take and they can see what problems exist with their schedule. There is a button they can press to request administrative rights. At present the granting of administrative rights is done by hand.

Persons with administrative rights are taken to an administrative menu page that shows all existing options. Options for which the user does not have rights are displayed by they are grayed out.

11.4 Student Menu

A separate document, “Student Guide to MAPPER,” goes into detail on the options typically available to students. It also gives advice on creating a good Major Academic Plan.

Briefly, students are taken to the MAP that was most recently saved. They are allowed to change classes among their future plans. They can save their work. They can go to a history of saved files to reload work from a previous session, thus giving them the ability to store several versions of their MAP. But most importantly they can see the potential problems that may come up, including prerequisites planned out of order, required classes still to be planned, and courses planned for semesters when the faculty have not said they will be offered.

11.5 Administrative Menu

11.5.1 Find

Imagine a student has just come to your door. They want you to sign their Contract of Understanding as a faculty advisor. But you don’t know them from Adam.

One approach is to key their name (or email address or student ID number) into the blank and press the [Find] button. Matching students will be identified. You can click through on the correct student to see their map, complete with grades. (Access rights can be controlled on a per user basis.)
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This should enable you to understand the big picture better.

11.5.2 Hotlist

When viewing a student’s MAP, you can click on the [Remember] button to put that student on your hot list. The hot list is just a faster way to go directly to students of interest to you. This might include the students for whom you have signed on as faculty advisor.

11.5.3 MMerge

MAPPER provides a Mail Merge capability. Most screens that give lists of students also provide a way to select students for a mailing. For example, you may want to request the students with the worst progress to come see you.

For each mailing, you can designate persons to be on the CC line as well as persons to be on the BCC line. Only one student at a time will appear on the TO line. If several students are selected, each email will be generated and sent separately so the students never see each other’s names.

The Mail Merge function also allows you to insert mail merge variables into your message. There are codes for FirstName, LastName, NickName, GPA, ID number, and other things. These can be handy pieces of context as part of your paper trail when dealing with potential problems.

11.5.4 Courses

This section allows everyone to see what semesters each course is planned, so far as MAPPER has been made aware. Those with rights can change that information. Faculty should typically print off a list of the courses offered by the department and mark it up with corrections for updating by the Academic Advisor.

Each course is listed with a forecast of when it will be offered. The forecast is based on a two-year repeating cycle. Each class can be offered in any of these ten slots: Even First, Fall, Winter, Spring, Summer, Odd First, Fall, Winter, Spring, and Summer.

As the forecast is changed, students are immediately able to see problems
in their future plans as well as opportunities to take classes that they had planned for later.

Each course is also listed with a set of prerequisites. The prerequisites are grouped such that one class from each group must be taken before the prerequisites are considered to be satisfied.

For example: \((\text{math106} \ \text{math110}) \ (\text{math221} \ \text{math321} \ \text{soc205} \ \text{psyc205})\)

The above prerequisite specification requires the student to complete either math106 or math110 before taking the follow-on course. Also, the student must complete statistics which is regarded as being any one of these four courses: math221, math321, soc205, and psyc205.

In each group, the first course mentioned will be the one suggested to the student, but of another course was taken, the prerequisite will be considered to be satisfied.

11.5.5 Rolls

Faculty can specify a semester and a list of course prefixes. Active student MAPs will be reviewed to see what is planned in that term. (Discontinued students are not included. Completed students are not included.) All courses that match those prefixes will be tallied.

A prefix is simply the first characters of the course designator. For math221, the normal prefix is math, but the following are all prefixes of math221: m, ma, mat, math, math2, math22, math221.

By searching on math, all courses that start with math are listed. By searching on hist20, all classes that start with hist20 are listed.

Semesters are indicated using the four-digit PeopleSoft codes adopted at BYUH. These codes are formed by dropping the second digit of the year and adding a digit for the semester or term. Before 2009, the terms were 1=Winter, 3=Spring, 4=Summer, and 5=Fall. Starting 2009 the terms are 1=Winter, 2=Spring, 3=Summer, 4=First, and 5=Fall.

Thus, Fall 2007 would be coded as 2075. Spring of 2010 would be 2102.

After entering a list of one or more prefixes, together with a semester and zero or more classes to omit, MAPPER will report the results.

Results include two triangular conflict matrices, lists of students for each class, and lists of students for each pair of classes. These pair-wise lists are
important for avoiding schedule conflicts for small classes but can usually be ignored for larger courses where multiple sections are offered at varying times.

Each conflict matrix is organized like a mileage chart often seen on older road maps. The diagonal lists the courses and gives the estimated enrollment for each course. The intersections give the number of students that overlap between the two classes. By clicking on any number in the matrix you are taken directly to the list of students involved.

11.5.6 Course Repeat Analysis

Satisfactory progress can be measured in different ways. Generally we recognize a form of progress based on Grade Point Average (GPA) and we expect students to have a Term GPA (TGPA) of 2.0 or better as well as a Cummulative GPA (CGPA) of 2.0 or better. Students that fall below this line are put on Grade Warning, Grade Probation, and Grade Suspension.

But there is another form of progress: Academic Progress. This is not well defined in the general case, but is broadly defined as being on track to complete the major in a timely way.

Major Progress Ratio

MAPPER offers assistance in making that assessment. The metric for comparing academic progress is Major Progress Ratio (MPR). Students with a high Major Progress Ratio over 100 are completing their major coursework faster than they are completing their degree as a whole, meaning the 120 credits required for graduation. A student with an MPR of 50 would be expected to complete about half of his major by the time he had earned 120 credits overall. That would probably be a problem.

Students with a low Major Progress Ratio may not be making satisfactory academic progress. MAPPER makes it easy for you to identify such students. You can then conduct your own case by case review to see which should receive formal sanctions.
Projected Repeats

MAPPER also computes statistics based on Major Course Repeats. A Major Course is defined as a class required in that major, whether or not it has the usual prefix. The Computer Science major requires certain mathematics classes so they would be considered major courses for a CS student. Based on the options and requirements listed on the Major Requirements Sheet (MRS) and the plans and accomplishments of the student in question, a list of major courses is drawn up for each student.

For each course on that list it is expected that the student will earn a grade of C- or better. Any grade below that is counted as a repeat, even if the repeat has not actually taken place, and even though a limited number of D grades may be allowed. To some extent this oversimplifies reality, but in borderline cases a human can refine the analysis.

We can compare the number of courses required to the number of courses completed and the number of retakes caused. This can give us statistics such as the Actual Repeats number and the Projected Repeats number. For students with repeats but still no courses successfully completed, the projected repeats number is capped at 99.

Students with a high number of projected repeats may not be making satisfactory academic progress. MAPPER makes it easy for you to identify such students. You can then conduct your own case by case review to see which should receive formal sanctions.

11.5.7 Major Requirements Sheets

Graduation requirements are organized by Major Plan. A large number of Plan codes exist. For example, COMPSCI is the code for a BS in Computer Science. ACCT is the code for a BS in Accounting. For convenience, each plan can be listed on one or more departments. For example, MATHED might be listed under MATH and under EDUCATION.

Within a plan, requirements may vary from year to year. These specific requirements are written up as a Major Requirements Sheet (MRS). Essentially the MRS is a list of requirements, each of which must be satisfied for the student to graduate.

A requirement (for MAPPER) is a number of credits that must be earned together with a list of courses that can satisfy that requirement. For ex-
ample, the MRS may indicate a requirement to take 3 credits of Statistics. Normally that would be accomplished by taking MATH 221. However, the department may be willing to accept MATH 321 instead, or PSYC 205, or SOC 205. The requirement line would list all those options.

Major Requirements Sheets can be viewed by all persons with administrative rights. Those with special rights can update the MRS sheets. This would most likely happen when a new class is recognized as acceptable in fulfilling an existing requirement. It could also happen if a required class is renumbered or renamed.

11.5.8 NS/I

This section is not operational at the time of this writing, but is intended to make available a list of students in various classes whose grades are listed as NS (Not Submitted) or I (Incomplete). Department chairs may want to review this list from time to time so that such temporary grades are converted into an appropriate final grade.

11.6 Bug Report

Finally, there is the Bug Report facility. Like a textbook, MAPPER has benefitted from the efforts of many people, especially the academic advisors and early adopter department chairs. But as is widely recognized, all non-trivial software contains bugs. MAPPER is no different. And all non-trivial software could be improved. MAPPER is no different.

As you use MAPPER, if you think of an improvement that would benefit yourself and possibly other people, please suggest it. Nearly every screen has a [Bug?] button that will take you to a place where you can report your thoughts.

Some bugs and features are easily completed. Others are deviously difficult. Often it is hard to tell them apart until you try to satisfy them. Send in your thoughts and let us decide whether they can be integrated easily or must wait for a future major release.

But in any case, thank you for using MAPPER and thereby making it stronger. And thank you for all you do to make our students successful.
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