# **Introduction**

## **Software Purpose and Scope**

The simplification and standardization of how departments and faculty members of Montana track and assess courses based on the Accreditation Board of Engineering and Technology (ABET) and Northwest Commission on Colleges and Universities (Northwest) student outcome goals. Other data tracked includes results of the Fundamentals of Engineering Exam (FE). Additionally, repetitive and tedious tasks will be streamlined to the benefit of faculty members, and will course assessment over multiple years will be easier to track. Eventually all departments that track ABET or Northwest outcomes will be able to use the database.

## **Document Purpose and Contents**

*[This subsection should explain the purpose for writing an SRS for this project and describe the intended audience for the SRS. This subsection should describe the information that will be presented in each of the subsections from §2 on.]*

## **Definitions, Acronyms, and Abbreviations**

The following tables of definitions, acronyms and references may be useful for reading this document.

### **Definitions**

|  |  |
| --- | --- |
| **Administer** | See “Authorized Administrator” |
| **Analytical Data** | Data that is no longer editable, and has had all sensitive information about students (names etc.) stripped out of it. |
| **Authorized Administrator** | Member in the MTECHS domain who is registered in the StOut system and has been assigned the administrator role for one or more programs. |
| **Authorized Faculty Member** | Montana Tech faculty member in the MTECHS domain who is registered in the StOut system and has been assigned to teach one or more course offerings. Faculty members may be “active” or “inactive”. |
| **Authorized Observer** | Anyone with an account in the MTECHS system who has been assigned the “observer” role. |
| **CORE** | Course Outcome, Review and Evaluation (CORE) |
| **CORE Report** | A report which faculty members in some departments are required to write for each course offering which they teaching. The StOut web application generates statistics for this report. (See CORE Statistics) |
| **CORE Statistics** | Report showing the extent to which student outcomes were met by students in a course offering. |
| **Course** | Course contributing to measuring student outcomes. Courses are identified by a prefix and number, such as ESOF 328. The course prefixes are dependent on the program they are part of. The course has a name, such as Software Requirements and Specifications. |
| **Course Offering** | A particular section of a course offered in a particular semester. Course offerings are identified by a course, a section, and a semester. |
| **Course Outcome** | Criteria which students passing the course should meet. These are specific to the course and are different than ‘Student outcomes’ which are specific to a program. StOut does not measure course outcomes. This term does not appear elsewhere in this document and is included here to avoid confusing this with student outcomes. |
| **Course PC Report** | Report showing the extent to which students met performance criteria during the semester(s) of interest. This report is divided by performance criteria and courses. |
| **Default Semester** | The semester used when no semester is given (for instance, creating a course offering or a new course). |
| **Faculty Member** | An educator that works at Montana Tech |
| **Matrix Report** | Report showing the association of courses to performance criteria and the weights of those associations. This is used to get an overview of the extent to which courses are covering performance criteria. |
| **Metric** | A metric associated with a course offering. The metric is created by the instructor of the course. It consists of a description, maximum number of points, and a list of the student outcomes which it measures. Can also refer to measurements of a course’s success. |
| **Metric Goal** | The overall (percentage) score which a student needs to meet or exceed to be considered to have met the student outcomes.  This needs to be stored in such a way so the metric goal can be changed easily. Throughout this document, it is assumed that the metric goal is 70%. |
| **Modern Browser** | Any web browser which reliably implements the latest standards in HTML and CSS, with complete support for JavaScript. |
| **Outcome Report** | Report showing the extent to which students met the selected student outcome during the chosen semester. This report is divided by the performance criteria which measure the outcome. |
| **Operational Data** | Data that is still editable. Data may also contain sensitive information about students if the department allows it too. |
| **PC Semester Report** | Report showing the extent to which students met performance criteria during the semester(s) of interest. This report is divided by performance criteria and semesters. |
| **Performance Criterion** | A criterion which a program will use to assess a student outcome. |
| **Performance Criterion Abbreviation** | Abbreviation which will be used to identify an performance criterion. |
| **Program** | A degree program. This system is to facilitate assessment for any participating programs from Montana Tech. |
| **Program Abbreviation** | Abbreviation which will be used to identify a program. |
| **Raw data** | Raw data is the number of students, weight of the course, and percentage. |
| **Registered in StOut** | StOut contains user information for this person. |
| **Semester** | A Montana Tech semester. Consists of a year and either fall, spring or summer. |
| **Semester(s) of Interest** | A single semester or a range of semesters for which a report is being generated. |
| **Simple Average** | An average of each value with no weighting due to characteristics of the values. |
| **Student Score** | The score that a student earned on a metric. |
| **Student Outcome** | A criterion which a program will assess for ABET or Northwest accreditation. |
| **Student Outcome Abbreviation** | Abbreviation which will be used to identify a student outcome. |
| **User** | Montana Tech faculty member or staff in the MTECHS domain who is is registered in the StOut system. In addition, anyone with an account in the MTECHS system who has been assigned the “observer” role. |

### **Acronyms and Abbreviations**

|  |  |
| --- | --- |
| **AD** | Adaptability |
| **AL** | Availability |
| **AUC** | Analysis Use cases |
| **CM** | Communications |
| **CT** | Cost |
| **DB** | Database |
| **DC** | Design Constraint |
| **DD** | Delivery Data and Conditions |
| **DL** | Delivery Environment |
| **DV** | Development Environment |
| **EN** | Enhanceability/Extendibility |
| **FE** | Future Enhancements |
| **HF** | Human Factors |
| **HW** | Hardware |
| **IUC** | Illustrative Use Cases |
| **ML** | Maintainability |
| **OP** | Operations |
| **PR** | Performance |
| **PT** | Portability |
| **QL** | Quality |
| **RL** | Reliability |
| **SC** | Security |
| **SDD** | Software Design Description |
| **SRS** | Software Requirements Specification |
| **ST** | Standards |
| **SI** | Site |
| **SW** | Software |
| **UB** | Usability |
| **VV** | Verification & Validation |
| **XI** | External Interfaces |
| **XXX** | X of X of X |

### **Technical Definitions/Data Dictionary**

*[This subsection shall list (alphabetically) and briefly describe all data collections and items mentioned in this SRS. If a data base is not involved the technical items names in the requirements are defined here. These names should be chosen with care. The expectation is that these names will be used later in the design and implementation.]*

|  |  |  |
| --- | --- | --- |
| **ItemName** | **Type** | **Brief description of data item** |
| Course | Table |  |
| Course Outcome | Table | Linking table between Course and Outcome, tracks what courses are tied to which outcomes |
| Course Prefix | Table | Unique identifier for classes in a program (ex. CSCI) |
| Program | Table | Names of Degree Program |
| Metric | Table | Methods that judge whether an outcome has been met in a program |
| Outcome | Table | Tracks data related to the current course including course number and ID |
| Offering Outcome | Table |  |
| Program Cutoff | Table | Dates when outcome information is due for a certain program |
| Offering | Table | A particular class taken in a particular semester by a student. Unique to both the class, and the semester. If there a class is available at two different times in a semester, it has two offerings distinguished by an offering number appended onto the course number |
| Semester | Table | Time frame when classes are taken by students |
| Semester\_Type | Table |  |
| Job Title | Table |  |
| Users | Table | Login information of all users |
| Permission Set | Table |  |
| Program Permissions | Table | Linking table between Users, Program, and Permission Set, tracks who has what permissions in what program |

## **References**

ABET, <http://www.abet.org/>

CAS, <https://wiki.jasig.org/display/CAS/Home>

Fundamentals of Engineering Exam <https://ncees.org/engineering/fe/>

NorthWest Commission on Colleges and Universities <http://www.nwccu.org/>

W3C XHTML validation software, [http://validator.w3.org](http://validator.w3.org/)

W3C CSS validation software, <http://jigsaw.w3.org/css-validator>

# **General Factors**

General factors include aspects of the product from a high level, that do not fit nicely into any of the following sections. Also included is an explanation of functions that the overall database is capable of, capabilities of different roles, and different kinds of reports that it will be able to generate.

## **Product Perspective**

This web application will be independent of other products except CAS (see Section 2.5, Dependencies).

## **Product Functions**

This section provides a high-level overview of the functionality of the web application.

#### **Function Overview**

The StOut web application will be used to:

* Record student outcomes associated with ABET and Northwest
* Record student results on the FE
* Associate performance criteria with student outcomes
* Associate performance criteria with courses
* Associate faculty and students with course offerings
* Enable faculty to record metrics of the course offerings they teach
* Enable faculty to record the scores which a student earned on an metric
* Generate a variety of reports indicating the extent to which performance criteria were met
* Allow observers to see reports and all of the information leading to the report, with student names redacted

These functions are divided into three overlapping sets: faculty, administrative, and reporting functions.

#### **Administrative Functions**

* Add, edit, delete and view users of all roles in the StOut system
* View the semesters in the system and set a default semester
  + - 1. **Program Coordinator Functions**

Authorized faculty members and administrators are able to do the following:

* Tell the system to generate the next chronological semester
* Add, edit, delete and view student outcomes
* Add, edit, delete and view performance criteria for student outcomes
* Add, edit, delete and view courses, along with the performance criteria associated with them
* Add, edit, delete and view Outcomes that are related to each course
* Add, edit, delete and view Course outcome metrics to courses
* View students in a course offering
* View Reports generated from the analytical side of the database
* View a Program Assessment generated from the analytical side of the database

Note that when data for a course offering is moved to the analytical database, student specific information will be removed, and that a Program Coordinator only sees information related to their program.

If a user is both a faculty member and a program coordinator, that user will be able to view and edit the information associated with a course offering which they teach.

#### **Faculty Functions**

Authorized faculty members are able to do the following:

* View the course offerings that they are currently teaching or have taught in the past
* Add metrics to course offerings that they have taught or are teaching
* Add or remove students from course offerings that they taught or are teaching
* Enter student scores on the metrics in the course offering which they taught or are teaching
* Import a list of students into a course.
* Export a list of the students in an offering they have taught or are teaching.
* View Reports generated from the analytical side of the database

#### **Reporting Functions**

Program Coordinators are able to do the following.

* Generate CORE statistics showing the extent to which students enrolled in a course offering met the performance criteria associated with that offering
* Generate a Course PC Report showing the extent to which students met performance criteria per course during the semester(s) of interest.
* Generate a Matrix Report showing the weights associated with courses assessing performance criteria for a specified program. Note that this report generates the information for the current semester.
* Generate an Outcome Report showing the extent to which students met performance criteria for a semester.
* Generate a Course PC Semester Report showing the extent to which students met performance criteria per semester over the semester(s) of interest.
* Generate analysis of student performance on the FE per program

All reports will be generated from the analytical side of the database, where all sensitive information has been stripped from course offerings

## **Environmental Conditions**

StOut will be a web application available to all faculty through the Computer Science departments Katie Server. Montana Tech will need a web and database server in order to serve StOut.

Users will need a Montana Tech account in the MTECHS domain to access this system. They will also need to be registered within the StOut system, i.e. StOut needs to contain the username for this person.

## **User Characteristic**

The primary users of this system are the faculty and staff of Montana Tech. Someone who has a username in the MTECHS, is registered in StOut and has been assigned the role of “observer” for one or more programs will also be a user of this system. An understanding of the assessment process, a familiarity with web browsers, and proficiency completing forms on a computer, is assumed.

Users can be assigned one or more of the roles: administrator, program coordinator, faculty, and observer.

## **Dependencies**

StOut will utilize the Central Authentication Service (CAS). CAS is a single sign-on protocol for the web. CAS allows web applications to authenticate users without gaining access to a user’s security credentials.

CAS is offered by Montana Tech’s Campus Technology Services and is used to authenticate Montana Tech users for most campus applications. Without CAS, users of StOut would need to create and remember another username / password combination to login to StOut.

## **Assumptions**

All degree programs that use StOut will have either identical or very similar methods of tracking their outcomes.

# **Analysis Use Cases**

## **Actors**

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| --- | --- | --- |
| **Primary Actor** | **Description** | **Use Cases** |
| **Administrator** | A permission that allows users to do administrative functions for the database. This permission is meant for administrative staff.    Examples:  Secretaries and Department heads | Add/edit/delete/view student courses  Add/edit/delete/view student outcomes  Add performance criteria to student outcome  Edit/delete/view performance criteria  Add/edit/delete/view users  Add/edit/delete/view course offerings  Generate next semester  Import lists of students  Set default semester  View semesters in system  Set Program Coordinator |
| **Program Coordinator** | Users that will manage a program’s courses, outcomes, and performance criterias. | Add Instructor  Remove Instructor  Update Instructor  Get Course Reporting Report (who has / hasn’t input)  Set input deadline  Get reports (analytical data)  View operational (raw) data  Set program configuration  Add course  Remove Course  Update Course (general info, outcomes)  Update Course (outcome data, operational data) (instructor use case)  Add Program Outcome  Remove Program Outcome  Update Program Outcome  Add Program Assessment  Remove Program Assessment  Update Program Assessment |
| **Observer** | A permission that allows the user to view data, with student names redacted. These users are not allowed to modify data. | View student outcomes  View courses  View course offerings  View metrics associated with a course offering  Generate C.O.R.E. Report  Generate Course PC Report  Generate Matrix Report  Generate Outcome Report  View data of a class, with student names redacted. |
| **Faculty member active** | A permission that allows the user limited add, edit, view, and delete permissions to offerings they are associated with. The user is also allowed to generate C.O.R.E statics. | Add/remove students from course offering  Add/edit/delete/view metric within course offering  Add score(s) to metric  Export list of students  View course offering  Generate C.O.R.E. statistics |
| **Faculty member inactive** | A permission for ex faculty members. Meant to help preserve data for historical reference. | None |