Automotive Seminar Workbook

Table of Contents

Overview

Module Purpose

The Power of Suggestion

It has been said,

If you sow a thought, you reap an action.

If you sow an action, you reap a habit.

If you sow a habit, you reap a character.

And if you sow a character, you reap a destiny.

Instructors plant seeds of knowledge in students. We watch them grow. We encourage students to take good care of these thoughts by providing experiences designed to cultivate the proper action. We are like farmers in a field of fresh minds. Students are not always good farmers. They don't always see the importance of taking good care.

Instructors evaluate student actions to determine student habits. We derive grades that reflect character. If bad habits are present, they will manifest themselves as flaws in the character or bad grades. These "flaws" are only flaws in the sense that student performance was not demonstrated as prescribed by the course syllabus. If we wish to effect a change, we must first define the change to take place. Assign the appropriate activity that will provide the student the opportunity to acquire new thoughts and actions culminating in growth of character.

Some students are willing participants in their education; some are more reluctant. It is ironic that people ask for help in learning, then resist the effort. Most students are at least open to suggestion if made appropriately, but may still resist the change necessary to grow. Be clear, thoughtful and persistent. Allow your students to accept change at a rate that is good for them. This book will present some methods and ideas about automotive education and help all that are open to possibly see things through a somewhat different perspective.

Learning and Teaching Methodology

The purpose of this module is to explain the methodology of applying real time evaluation techniques to technical occupation lab environments. Much time and conversation has been spent debating the proper way of teaching and evaluating student performance in technical occupations. Automotive technology is no exception.

Educators and industry people alike have spent untold years discussing the merits of different teaching strategies. How much time should be spent on lecturing or in the lab? Should we be evaluating only our student's skill and knowledge? Should we also be teaching interpersonal skills?

While there may be as many opinions as there are instructors, there is a great deal of evidence to support the notion that it is our responsibility to teach all the skills that are required for our students to function at a high level in our industry. This means we will inevitably identify characteristics that will be defined as knowledge, skill and attitude. Knowledge and skill are the most fundamental aspects of this training. However, it is attitude that employers identify as those attributes that separate their best employees from their good employees. Aside from blatant incompetence, it is a person's attitude that most often jeopardizes their employment. This course and accompanying book will attempt to address these issues and provide alternatives for faculty to use in their teaching.

Module Objectives

Expectations

The focus of this workbook is the implementation of course materials in a cohesive, integrated format. While samples of course syllabi, lab sheets and evaluation tools are offered for demonstration, this workbook does not intend to replace conventional methods of course development or other software provided for such purposes. This workbook will demonstrate ways of implementing the course materials and suggest strategies of utilizing them in a student centered learning environment.

Upon successful completion of this course the student will demonstrate the ability to:

- Assemble a course syllabus.
- Utilize the A.S.K. method of course development.
- Integrate SCANS skills into course offerings.
- Write performance objectives based on the NATEF task list.
- Utilize RO style lab sheets.
- Use Bloom's Taxonomy to write questions.
- Write RO style lab sheets.
- Create a performance grade sheet and student summary evaluation.

Instructor

There are various methods of delivery including conventional lecture and demonstration format utilizing power point presentations, computer based interactive learning modules, video presentations and web-based interactive instruction. This will be integrated with lab activities for skill development. If your program is like ours, you probably have limited resources to purchase the higher quality computer based interactive instruction modules. Careful planning of your curriculum and active pursuit of manufacturer partners will help stretch an already limited budget.

Students

Students benefit from the enhanced performance applications, interactive computer based media and detailed evaluation reports. Because instructors are able to provide a detailed evaluation report, students may know how well they are performing at any time they desire. Students will better understand the course structure, goals, objectives, and expectations allowing them to better influence the outcome of their educational experience. As the students become empowered to direct their learning experience, they will become skilled at initiating learning activities through group interaction and self-directed work-study.

Main Topic

Background

Learning Issues

Most people are capable of learning from many different experiences. There is a lot of talk in the educational community these days about learning styles. This information is important in the sense that people do have preferences in ways they feel comfortable and successful in the world. Identifying these styles could be helpful in determining teaching strategies to help students learn within their comfort zone and if you choose to provide a variety of learning opportunities, students will learn to learn with other delivery methods as well.

Adapting to learning styles will not be the fix-all panacea that some might imagine. There are too many other variables in the educational environment that must be addressed in order to provide a student with the best opportunity for learning. Remember when you were a student? Try to remember the way you felt and how those feelings impacted your ability to focus on the material being presented. Was the room comfortable or distracting? Was the instructor intimidating, not presentable, or otherwise offensive? Were the activities interesting on a content level as well as providing opportunities for cooperative learning? Was learning enjoyable or was it a chore?

Definitions

While faculty might argue that much of this is out of their control, much is not. Below is a list of the three main automotive student learning styles. These are really student types rather than styles, but the types of students do have ways they feel comfortable and ways they prefer to learn. Utilizing different delivery methods may also generate interest from students who lean toward distraction or boredom.

Thinkers

Thinkers are often perceived as the “best & brightest” students. They read, recall and analyze well. They make their instructors feel good because of their uncanny ability to perform well in an intellectual environment. Thus, some instructors may believe that they are the reason for this student’s success. Other instructors believe that these students are successful in spite of them rather than because of them. The truth is these students need an environment that challenges them to their full potential and supports them in their growth.

These are the students that sometimes make you wonder if they should have chosen something more challenging for their career path. They didn’t. They are the ones you think are smarter than you are. They could be. They can be intimidating. The instructor’s challenge for all students is to provide an enriched, not punitive learning environment. However, these students don’t always perform well in the shop and sometimes offend others with their know-it-all presence. Your goal for this type of student is to have them practice with their hands and lead with their hearts.

Testers

Testers are your ”hands-on” or kinesthetic learners. These are the students many people believe will make the perfect automotive student because they seem to be able to do so much with their hands. They may be labeled a “dummy” student because they have not developed their reasoning abilities as much as the thinkers, but may be quite intelligent. They feel most successful in the shop. Many of them don’t like to read and don’t perform well on written tests due to the cognitive nature of these activities. Many of them leave their homework unfinished. The challenge here is to motivate these students to develop their cognitive abilities by challenging them to explore the cognitive world. Your goal for this type of student is to encourage them to think and reward them when they do.

Gamblers

Gamblers are many times the most difficult of your students, not because of their lack of intelligence, but because of their habits. Gamblers have spent the better part of their lives not preparing for the challenges that lie ahead. Because they have experienced

some level of success they don't always see the need to change the way they learn. Their problem is not with their skill or knowledge, but with their attitude. They think they can learn "enough" by just attending your class without necessarily participating. They think they can do most anything without practice and because these students are typically intelligent and skillful, they may achieve a limited amount of success. The problem is they may not be skillful or knowledgeable enough to meet the class requirements. When these requirements are not met, the student may become argumentative. There is some truth to their reasoning which gives them their argument when they fail, but this may leave their instructor frustrated by what is perceived as a lack of preparation and uncooperative attitude on the student's part. Your goal for this type of student is to help them care by encouraging the development of a productive craftsman.

As you can see, each group of learners has their own challenges. The truth is most of your students will have a combination of styles. One student type may be comfortable with one type of assignment and very uncomfortable with another. The reason for providing different types of learning opportunities is not just to make students feel comfortable, although this is certainly true. It is however, to also challenge a student to grow an under developed part of their own character. The challenge is to provide a diversity of learning opportunities to help each style learn in comfort as well as providing enough opportunity for growth of those areas that have deficiencies.

Student Preparedness

Basic student preparedness is also an issue. How many students have you seen that cannot stay awake? Have you ever noticed that it always seems to be the same students that are late? These are all interpersonal skills that we should be addressing in our courses. These are issues for us as well as our students. If you find your students sleeping in class, you need to determine if the student has a problem with being attentive or if your instruction isn't meeting the needs of your students. In other words, are you spending too much time lecturing about things that could be taught with a better instructional method? Students should be able to sit and discuss issues for a reasonable amount of time, but recent studies show that the reasonable amount of time, about 20 minutes, is shorter than many lectures. If getting to work on time and staying focused are important characteristics of employees that work for our industry partners they should be a part of our curriculum.

Students must be ready to learn, however and this is a major problem in many classes. Trying to teach students is very much like farmers planting crops. The readiness and willingness of the student are serious variables to effective instruction. Think of the old farmer's saying that reminded them if the ground was the right temperature for planting. "If you can sit on the ground with your trousers down, it's safe to sow your seeds."

Younger students seem to need more stimulation to keep them interested. Adult learners in particular need to know how the material applies to them and how it addresses their career goals. This is a difficult issue for faculty because it requires a more diverse delivery method than we are accustomed to using. However, for many of our students, interest in the content may be won or lost in the presentation of the material. Light humor, graphics and animation are often helpful in gaining and retaining students' attention. How better can you teach the basic operation of an internal combustion engine than to show a graphic animation of the piston going up and down and the valves opening and closing in time? Whether you are personally entertaining or not, strategies to engage and connect with students is a must for any performance class.

Environment

The physical environment impacts people in many ways. It communicates their importance because it reflects the importance of the activity from the perspective of the school and the instructor. If the room is cluttered, in disrepair or smells offensive it says that the sponsoring organization does not value the learning environment. Therefore, it does not value the student. These are not such extreme examples. Many programs live with these problems daily. Other examples might be that the temperature is too cold or too hot. The décor might be too busy or bland. Or it may simply be that there is an excess of noise from mechanical systems or people in the vicinity.

Instructors are people too. They become accustomed over time to an environment. Many of us forget to pay attention to the slow degradation of our classrooms. You should make time to review your classroom periodically to determine if it is meeting the needs of your students. Solicit other opinions from your colleagues, other staff at your school and even your students. This issue clearly should be a part of any evaluation of instruction you ask your students to provide.

The emotional environment of an automotive classroom includes issues of personal safety. The instructor is responsible for setting and maintaining the safety standards for all students. The instructor sets the tone for the class by modeling acceptable behavior. The instructor enforces the safety standards by fully participating with the rules of the institution. Does the instructor utilize equipment safety guards and wear safety glasses? Is he overbearing, trying to intimidate the students? Does he allow some students to harass others? Maybe he is obviously interested in a particular group of students to the exclusion of other students. If students sense this behavior, much of the instructor's credibility may be lost. The instructor must set a tone that assures everyone that he is in charge of the class, yet values each person's contribution.

Core Content

The core content of a course is where you address the needs of the vast majority of your students. Most of your students should be prepared for this material if your curriculum has the proper prerequisites in place. The objectives of the course must also meet the criteria of the course description including the NATEF tasks, if your school is NATEF certified. Use the NATEF task list as the standard for detailing and tracking the course skill objectives.

When writing your course objectives ask yourself if the content is relevant to the class. The instructor should keep the conversation limited to the topic of the class as much as possible. You may want to spend some time bonding with your students, but don't let this become excessive. Most adults would be offended if they committed their time and money to an activity that did not focus on the advertised topic. Basically this goes to a person's feeling of importance. If you value me, you will value my time.

Remediation

Remediation is a prescriptive action taken in response to a defined student deficiency. This is one of the key elements in responding to individual student needs. Remedial work is that which is done outside the scope of the course and yet is essential to the desired performance of the student. Students can experience deficiencies in any of the three types of objectives.

Within the attitude objectives are misbehaviors that require redirection of some sort. These are deficiencies from normal expected student behavior. For this reason it becomes essential that you define and they practice the expected behaviors. If you find a particular problem with the way your students behave in your class, try to identify it in terms of why the behavior is inappropriate. You will go a long way in changing the behavior if you can clearly identify your expectations. This requires communicating the reasons behind your expectations.

If a student is unwilling to comply with the standards of your course, you could implement a behavior plan that requires the student to document their failure to comply with the course structure. The response a student gives on the sheet will also indicate the student's acceptance, understanding or denial of their behavior. This is an effective tool for dealing with students who continue to disrupt class even though you have counseled them on their behavior. Included in this workbook is a worksheet requiring the student to explain why they have been removed from the classroom environment. It is called the Student Reflection Form.

The Student Reflection Form provides the student with an opportunity to reflect upon and to judge his or her own conduct. Have the student complete this sheet before they return to class and if necessary, obtain a signature from the Division Dean. This would

certainly call to the student's attention your displeasure with their behavior as well as the attention of the Dean. Counseling with them afterward gives you both an opportunity to discuss and understand the expectations of each other in a private environment. If they continue to misbehave in your class, you would have a strong argument for their removal. This documentation helps protect the instructor, the student and the classroom environment.

Student Reflection Form

The purpose of this form is to allow students time to reflect on issues, behaviors or situations that adversely effect the classroom learning environment. A student issued this form must complete it before returning to class. The Automotive Dean's Signature is required for multiple infractions or where required by the instructor as indicated below. The classroom attendance policy is applicable during the time this form is being completed.

The student behavior that generated the need for this action is related to the following:

❑ Argumentative ❑ Disruptive ❑ Disrespectful ❑ Destructive

❑ Abusive ❑ Belligerent ❑ Confrontational ❑ Other _____

What I did to warrant this action:_____

What I should have done:_____

What I will do different next time:_____

❑ Required _____
Student Signature

❑ Required _____
Automotive Dean Signature

Remedial skills are built into the course design. If you think of skills as being something that must be developed over time, you will have built in remediation. Skills will be repeated course after course thus encouraging the improvement of those skills. This makes the evaluation and tracking of skill development important in your course design. Remediation does not require original activities. Often students will benefit from repeating core activities as a method of remediation. The key to effective remediation is to identify the appropriate attributes that need remedial work.

Enrichment

Have you ever wondered why there are no Honors Automotive courses? There could be a lot of reasons. One may be because the typical automotive student is very pragmatic. They see no intrinsic value for the effort. Many students are not motivated to do more than the "required" course work. Some students ask, "What do I have to do to get a C in your class?" This is very frustrating for instructors that want to see their students excel in their careers. If you struggle with this same problem, then you may need to rethink the performance requirements in your class.

At Brookhaven, a student cannot earn a D in an automotive course. He may earn a F or a C, but not a D. A D grade would indicate unacceptable performance, therefore we must assign a grade fitting an unacceptable performance. Because of this policy, we have had to rethink our position on what it takes to earn a passing grade in our classes. A C is not average performance, but minimally competent performance. A B grade is for average performance and an A grade indicates exemplary performance.

Trying to differentiate student performance in terms of how well they perform on skill or knowledge evaluations can be difficult. If a student performs an assignment more quickly or accurately, does that mean they deserve a better evaluation? No, not necessarily. The learning environment should reward all students for a quality performance. The question of efficiency will be answered by the completion of course assignments. Slower students may not complete all assignments, but will have acceptable quality on the ones they complete.

If a student must competently complete all core assignments to receive a C and demonstrate a strong skill ability and knowledge level of the material to receive a B, then shouldn't the A grade be reserved for those students that excel over and above these groups? In fact, the A student should demonstrate something beyond a good performance in the core content. They need to demonstrate mastery of all course components or a strong performance of course objectives and additional enrichment activities.

Good enrichment activities are used to differentiate between your good students and your excellent students. These activities might include some out of class assignment where the student participates in a leadership role in the community or the classroom. Other activities that will differentiate students are in the affective domain. Often the difference in employee performance is the attitude of the employee. By assigning enrichment activities in your course, you can sculpt the course requirements to require one or more of these activities for students who want the A while encouraging all students to emulate the desired personal qualities.

Subtopic I: Establishing Course Content

Syllabi

The course syllabus is a type of contract where all communication begins between the students and the instructor. Try to define the scope and sequence of the course as well as the specific course objectives that outline the course content. The syllabus is the cornerstone of the course upon which all other course elements are assembled. It is also a summary of all the key elements. It sets the tone and communicates the instructor's personality in terms of expectations. Be careful that it communicates your desires on as many levels as possible. Students will begin to get a sense of the your expectations through the appearance and tone of your syllabus as well as its content. If your syllabus is unclear, some students will take that to mean that being unclear is an acceptable performance for the course.

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AUMT1305

Introduction to Automotive Service

Course Description

Prerequisites: None. An introduction to the automotive industry including automotive history, safety practices, shop equipment and tools, vehicle subsystems, service publications, fasteners, professional responsibilities, and automotive maintenance. May be taught manufacturer specific. (96 Contact Hours) (3 CR/ 2 LEC, 4 LAB, 0 EXT)

Learning Outcomes

Utilizing appropriate safety procedures, the student will demonstrate familiarity with historical development and career information on the automotive industry; demonstrate safe, professional, and responsible work practices; identify and demonstrate the proper use of shop equipment and tools; identify and describe functions of vehicle subsystems; demonstrate the use of service publications; identify various automotive fasteners used in industry; and perform automotive maintenance.

Course Focus

This course will use Service Technical College course content as its focus. Techline equipment, essential J-tools and course resources will be used to support the philosophy of "FIX IT RIGHT THE FIRST TIME". Upon successful completion of this course, the ASEP student will receive STC Know How course credit for New Product Update.

Text and References

Automotive Excellence, Volume 2	Glencoe
Brookhaven College Catalog	
Automotive Technology Student Information Package	

Divisional videos, divisional newsletters, service guild letters and instructor prepared handouts will be made available for ASEP students' use during this course.

The references listed below will be provided to the students by GMSTC.

Automotive Fundamentals Book	10294.04
SI 2000 Overview CBT	10040.01W
GM Vehicle Identification Number System	GM-VIN02

1

Writing a syllabus is the activity in which instructors engage to define the core content and performance standards that make up a course. Two areas that are typically used in a performance course are knowledge and skill. The third area, attitude, is sometimes a source of contention between the players, but it is a critical part of a complete training program. If you are not sure, ask your advisory committee if sound decision making, positive interaction with other employees and effective problem solving skills are valuable attributes of their employees.

The course content in the syllabus should be listed in chronological order for students to use as an outline for the course. The ASK method of course development also separates the content into the three domains of Attitude, Skill and Knowledge. The attitude, skill and knowledge objectives are the three essential elements of the educational experience. They are the three areas of the student that we as educators are trying to change. After all, isn't the process of educating also the process of change? Use this format consistently throughout the course documents. Include the objective in each activity assigned and use the same objective name to identify the grade on the grade sheet.

How do you effectively state and evaluate these goals? First, try to avoid global course grades like "class participation." Write the affective goals that apply to the students studying the material. These goals are written in terms of observable performance. The affective goals, once written, seem to repeat themselves. Of course you will adjust them from time to time, but a group of them that seem to apply to all automotive courses. This makes writing a course easier. This allows you to spend time concentrating on the knowledge and skills of the course. The following sections of this workbook deal with writing and integrating these objectives.

SCANS Competencies

In the Texas Higher Education Coordinating Board (THECB) Guide to Instructional Programs for Workforce Education (GIPWE) basic personal attributes are referred to as SCANS competencies. These are a set of broad academic and workplace skills developed by the Secretary's Commission on Achieving Necessary Skills (SCANS). Whatever you call them, they can be the difference between your program and other programs. These competencies are detailed below.

Basic Skills

1. **Reading:** Identify relevant facts; locate information in books/manuals; find meanings of unknown words; judge accuracy of reports; use computers to find information.

2. **Witing:** Write ideas completely and accurately in letters and reports with proper grammar, spelling, and punctuation; use computers to communicate information.

3. **Mathematics:** Use numbers, fractions, and percentages to solve problems; use tables, graphs, and charts; use computers to enter, retrieve, change, and communicate numerical information.

4. **Speaking:** Speak clearly; select language, tone of voice, and gestures appropriate to an audience.

5. **Listening:** Listen carefully to what a person says, noting tone of voice and body language; respond in a way that shows understanding of what is said.

People Skills

1. **Social:** Show understanding, friendliness, and respect for feelings of others; assert oneself when appropriate; take an interest in what people say and why they think and act as they do.

2. **Negotiation:** Identify common goals among different parties; clearly present one's position; understand party's position; examine possible options; make reasonable compromises.

3. **Leadership:** Communicate thoughts and feelings to justify a position; encourage or convince; make positive use of rules or values; demonstrate ability to have others believe in and trust you because of competence and honesty.

4. **Teamwork:** Contribute to group with ideas and effort; do own share of work; encourage team members; resolve differences for the benefit of the team; responsibly challenge existing procedures, policies, or authorities.

5. **Cultural Diversity:** Work well with people having different ethnic, social, or educational backgrounds; understand the cultural differences of different groups; help the people in these groups make cultural adjustments when necessary.

Personal Qualities

1. **Self-Esteem:** Understand how beliefs affect how a person feels and acts; *listen* and identify irrational or harmful beliefs you may have; and understand how to change them when they occur.

2. **Self-Management:** Assess one's own knowledge and skills accurately; set specific, realistic, personal goals; monitor progress toward goal.

3. **Responsibility:** Work hard to reach goals, even if task is unpleasant; do quality work; display high standard of attendance, honesty, energy, and optimism.

Thinking Skills

1. **Creative Thinking:** Use imagination freely, combining ideas or information in new ways; make connections between ideas that seem unrelated.

2. **Problem-Solving:** Recognize problem; identify why it is a problem; create and implement a solution; watch to see how well solution works; revise as needed.

3. **Decision Making:** Identify goals; generate alternatives and gather information about them; weigh pros and cons; choose best alternative; plan how to carry out choice.

4. **Visualization:** Imagine building, object or system by looking at a blueprint or drawing.

Use the SCANS competencies list as the foundation component for the development of course objectives. If we concentrate on these student-centered skills as the foundation for student learning, we will provide our students and their employers with skilled people that perform their duties at a high level of competence even as automotive technology continuously changes. We will use the automotive curriculum as a backdrop for teaching these personal skills.

The objectives for the automotive area should contain two types of skills. The first type of skill addresses the broad-based student-centered skills that relate to the SCANS competencies. These skills may be repeated in many courses with an on-going increase in ability and application. The second type of objective is vehicle-centered as outlined in the NATEF Task List. These skills are often, but not always specific to one course. Think of the vehicle-centered skills as an opportunity to practice the student-centered skills. A variety of objectives such as “precision measurements” or “utilizing service information” could be developed from the combining of these skill sets.

The student-centered skills are built over time, and as a result, are the single greatest variables to building student performance. Some students learn these skills quickly and can repeat them in future courses. However, other students can’t, resulting in their continual struggle with higher-level skill development, course after course. Because of this, spaced repetition learning strategies would apply to the broad-based student-centered skills in support of learning the vehicle-centered skills.

NATEF Tasks

Use the NATEF task list to establish course objectives for the vehicle-centered activities. It helps to become familiar with the NATEF tasks. Read them and think about how they are written and how you might use them in your courses. The tasks aren't written to be of practical use in an educational environment because they are either too broad to write an effective course objective or too narrow to fit the way technicians do their work.

For example, in section B of the Engine Repair category of the NATEF task list on the next page, you will see a list of tasks that describe sub-tasks of jobs a technician might perform in the shop. Many of these tasks describe measuring, inspecting or checking individual components of a system. While it is possible that a technician might be performing one of these tasks independently, it is more likely that he or she is performing many of these tasks in concert in order to complete a larger objective.

NATEF Task List Report

A1: Engine Repair

B. Cylinder Head and Valve Train Diagnosis and Repair

1. Verify camshaft(s) timing according to manufacturer's specifications and procedure. P-1
2. Remove cylinder head(s); visually inspect cylinder head(s) for cracks; check gasket surface areas for warpage and leakage; check passage condition. P-2
3. Install cylinder heads and gaskets; tighten according to manufacturer's specifications and procedures. P-2
4. Inspect and test valve springs for squareness, pressure, and free height comparison; replace as needed. P-3
5. Inspect valve spring retainers, locks, and valve grooves. P-2
6. Replace valve stem seals. P-3
7. Inspect valve guides for wear; check valve guide height and stem-to-guide clearance; recondition or replace as needed. P-3
8. Resurface valves; perform necessary action. P-2
9. Resurface valve seats; perform necessary action. P-2
10. Check valve face-to-seat contact and valve seat concentricity (runout); service seats and valves as needed. P-3
11. Check valve spring assembled height and valve stem height; service valve and spring assemblies as needed. P-2
12. Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); perform necessary action. P-2
13. Inspect hydraulic or mechanical lifters; replace as needed. P-2
14. Adjust valves (mechanical or hydraulic lifters). P-1
15. Inspect camshaft drives (including gear wear and backlash, sprocket and chain wear); replace as necessary. P-2
16. Inspect and replace timing belt(s), overhead camdrive sprockets, and tensioners; check belt tension; adjust as necessary. P-1
17. Inspect camshaft for runout, journal wear and lobe wear. P-3
18. Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine necessary action. P-3

Bloom's Taxonomy

Teaching and learning personal quality skills is not done on a short-term basis. These skills have to be integrated into a person's identity. Integration is something that requires practice and behavior change. In 1956 Dr. Bloom and his colleagues researched and developed a chart that defined learning in terms of performance level. Accepting the notion that people do learn at increasing levels helps educators organize curriculum in increasing levels of competency. This process of spaced repetition enables students to learn more deeply. Those levels are detailed below from lowest to highest. I like to think of the first three (convergent thinking) as dependent learning and the second three (divergent thinking) as independent learning.

Knowledge – the ability to recall material, awareness

Comprehension – the ability to explain material, understanding

Application – the ability to utilize material, task performance

Analysis – the ability to disassemble material, investigation

Synthesis – the ability to assemble material, creation

Evaluation – the ability to assess material, judgement

Bloom's Taxonomy provides us with the methodology to integrate course objectives over long periods of time allowing the spaced repetition needed to enhance student learning. With the ability to write objectives at an increasing level, we can effectively provide our students with curriculum that has built-in enrichment and remediation.

The taxonomy originally only included the cognitive domain. Later, it was expanded to include the psychomotor and affective domains. If your courses are to address the SCANS competencies as well as the NATEF tasks, you will inevitably have to address all domains. This workbook calls the three domains attitude, skill and knowledge. The domains have an inherent learning level hierarchy. Comparing the domains to Bloom's Taxonomy, it is evident that knowledge is the lowest level of Bloom's, skills are an application/analysis level and attitude change does require a certain amount of synthesis/evaluation before it is internalized.

Furthermore, the six levels of Bloom's Taxonomy can be re-divided into 3 simplified levels so they are more usable for course development. The first two levels of Bloom's, knowledge and comprehension, we'll call level 1. This is because we do teach knowledge, but mostly we look for comprehension. So anything in the first two levels of Bloom's Taxonomy will be level 1 for our purposes. The next two levels, application and analysis, are level 2. Consequently, the last two levels of Bloom's are level 3.

At this point you might infer that all level 1 activities are in the knowledge domain. This is not the case. Don't confuse the three domains of learning with the three levels of learning. While the knowledge domain is the lowest level domain, the domain itself can be taught and measured at any level of Bloom's Taxonomy and therefore at any of the three levels we have defined. An example would be using a written test to measure learning. Typically, you would use a written test to measure someone's knowledge or comprehension, however, you can measure their knowledge, ability to analyze, or evaluate with a written test.

Bloom's Taxonomy and the subsequent expansions of the taxonomy each contain their separate verb lists and suggest that certain verbs go with certain domains. Blur the lines. Develop a verb list of the activities in your courses and don't worry in which domain it belongs. Try to classify the objectives to the type or quality of activity rather than the level. This will allow you to teach each domain, knowledge, skill and attitude, to the level you determine to be appropriate to your students. I have included some of my frequently used verbs.

Attitude(affective)	Skill(psychomotor)	Knowledge(cognitive)
Comply	Replace	Define
Display	Measure	Describe
Exhibit	Test	Complete
Demonstrate	Demonstrate	Interpret
Appreciate	Repair	Identify
Embrace	Diagnose	Explain
Accept	Service	Develop

The verbs on this list came from different domains, but can be used interchangeably. Demonstrate is from the psychomotor domain, but it works in the affective domain as well.

Objectives

Objectives are written to make relevant each of the course activities for the student. The objective therefore, should be included in each activity provided in the course. State the objective clearly for the activity and make sure it relates to other activities of the same objective. While there are different ways of writing objectives, performance courses should use performance objectives written with student performance as the focus.

Attitude Objectives

Attitude objectives are related to how a person interacts with other people and/or their environment. These are the intangible traits that differentiate between average employees and exceptional employees. Arguably, these are the most difficult objectives to learn as well as to teach. They are the characteristics of good employees that employers find desirable in the workplace. Because these objectives are value-based, they are also the highest level of Bloom's Taxonomy.

Course Objectives

The following list of course objectives will be addressed in the course. These objectives are directly related to the performance objective addendum. (* designates a crucial goal. A crucial goal MUST be successfully completed in order to receive course credit.) The points may be adjusted during the course at the sole discretion of the instructor. Students will be notified if an adjustment is made.

	Attitude Objectives-Addendum A (5 Content Goals)	**MAX 40 pts.**
1.	demonstrate good personal habits	8 pts.
2.	exhibit safe work practices	8 pts.
3.	demonstrate team attitude	8 pts.
4.	demonstrate quality work	8 pts.
5.	display judgement	8 pts.
	Skill Objectives-Addendum B (7 Content Goals)	**MAX 145 pts.**
1.	navigate service manual	25 pts.
2.	demonstrate safe vehicle lifting procedures	20 pts.
3.	perform quick service	20 pts.
4.	perform tire/wheel service	20 pts.
5.	perform SIR disable/enable procedure	20 pts.
6.	test electrical circuits	20 pts.
7.	perform vehicle system check	20 pts.
	Knowledge Objectives-Addendum C (12 Content Goals)	**MAX 204 pts.**
1.	comply with student conduct statement	0 pts.
2.	comply with hazardous material safety practices	0 pts.
3.	explain proper tool usage	20 pts.
4.	explain service manual organization	24 pts.
5.	interpret vehicle label information	20 pts.
6.	identify fasteners	18 pts.
7.	identify dealership organizational structure	15 pts.
8.	explain engine oil issues	10 pts.
9.	explain electrical circuit theory	20 pts.
10.	explain SIR operation	20 pts.
11.	explain fundamental automotive systems operation	57 pts.
12.	complete New Product Know How	0 pts.
	Summary for course AUMT1305 (24 Content Goals)	**405**

1

Skill Objectives

Skill objectives are the kinesthetic or hands on portions of your course. While faculty in technical occupations have used hands on approaches to education for many years, faculty in traditional academic areas have typically seen them as unnecessary to the

educational process or at best a nicety for which students should be responsible. This is one reason so many students over the years have become "functionally illiterate." Teaching theory without application is ineffective for many people. Even the elite population of "excellent students" need time to experience the transition between the classroom and the workplace through work-study or internships.

Knowledge Objectives

Knowledge objectives are possibly the lowest level of learning in a course. This is the awareness level. Many of these assignments will have students defining terms, explaining concepts, etc. They are also a crucial part of the educational process in that they are the foundation for skill and attitude building. Use them for anything that would be taught or tested through reading, computer interaction or video. Knowledge assignments contain media that convey concepts through cognition rather than physical processes. The knowledge part of the syllabus identifies worksheets, tests, computer and video training. Conventional written testing methods work well to measure the student's ability to explain the course content to you.

Performance Objectives

Use the task list as a guide to make sure you are teaching all the things you should be, but write performance objectives that correlate better to a real shop environment. When you write the performance objective for your courses, state clearly all the tasks that will be performed upon completion of that objective. The important parts of performance objectives, shown below, include a resource statement, a task statement and the evaluation criteria. Performance objectives include:

- Identify the available resources the student will have (or not have) to complete the objective.

- State the expected student performance in observable terms using action verbs (from your course syllabus). Finish the statement "The student will…"

- Define he quantity of jobs the student must complete as part of the objective, the quality standard against which the performance will be judged, the efficiency and durability criteria of the objective.

- Describe the method of documenting the completion of the objective for grading purposes.

- Finally, include a list of all the NATEF tasks the objective will cover. (optional)

When you have incorporated all of these elements, you will have written a performance objective. Remember that the reason for doing all this work is to improve

communication with your students. Sometimes these objectives can be wordy and confusing. Be sure to re-read your objectives for clarity. A complete objective will look something like this:

> The student will be allowed tools and lab time. The student will perform cylinder head service. Performance will be satisfactory if two services are performed, the service is consistent with manufacturer's procedures, the service is performed within twice the flat rate time and the vehicle operates with no abnormal conditions for the duration of the course. The document of record will be the lab sheet provided to the student by the instructor. The tasks involved in this objective are:
>
> - Inspect and test valve springs for squareness, pressure, and free height comparison; replace as needed. P-3
> - Inspect valve spring retainers, locks, and valve grooves. P-2
> - Replace valve stem seals. P-3
> - Inspect valve guides for wear; check valve guide height and stem-to-guide clearance; recondition or replace as needed. P-3
> - Resurface valves; perform necessary action. P-2
> - Resurface valve seats; perform necessary action. P-2
> - Check valve face-to-seat contact and valve seat concentricity (runout); service seats and valves as needed. P-3
> - Check valve spring assembled height and valve stem height; service valve and spring assemblies as needed. P-2
> - Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); perform necessary action. P-2
> - Inspect hydraulic or mechanical lifters; replace as needed. P-2
> - Adjust valves (mechanical or hydraulic lifters).

Addendum

Also include an addendum with your syllabus. This is a document that defines the performance standard for all the course objectives. The reason it is a separate document is due to its length and detail of assignments, grades and performance criteria. Clarity of course objectives drive the need for detailed explanation of student performance. In most tech-occ programs students want to know the specific criteria upon which they will be evaluated. The course addendum should help address this need.

Subtopic II: Using Instruction Sheets

Instruction sheets are very useful in a performance instruction environment to guide students through activities as well as provide a document of record for the course. There are actually many types of instructional sheets. For simplicity only two permutations of the instruction sheet and a sample handout are presented. The worksheet is used for knowledge development and lab sheets for skill development, while a handout is used to communicate information about a specific system or procedure to the students.

There are many textbook publishers and automobile manufacturers that write worksheets, lab sheets and handouts to enhance their courses. You should use pre-published materials if possible and supplement where necessary. However, It may be difficult to find any single source that covers the content completely. The procedural worksheet/lab sheet is helpful on many occasions, but the diagnostic lab sheet is the one most needed. Therefore, writing your own lab sheets is a must. In this workbook you will find samples of lab sheets that might be helpful to you.

Lab Sheets

Lab sheets are a guide for students. They include instructions for navigating through the assignment as well as questions to challenge thinking and measure learning. These sheets are designed to guide students through a skill activity, usually in the form of a repair procedure or diagnostic process. Because these activities encourage students to practice workplace skills, they are designed to mimic workplace documents. The template for lab sheets included in this workbook is derived from a generic repair order. The purpose is for students to use this document to record their progress through the activity and provide instructors the opportunity to periodically intervene in the learning process.

The lab sheet layout allows you to list lines of instructions similar to the way lines of an RO list customer repair requests. However, these lines are not disconnected jobs, but connected steps for a given procedure. I have found the two most effective uses for the lab sheet are for repair procedures or diagnostic process. The actual procedure is typically not contained in the lab sheet. The lab sheet references the procedure in the service manual or in a handout. This way the student can keep the procedure separate from the assignment and you can use the lab sheet as the document of record for the course.

The lab sheets included in this workbook provide places to capture relevant information about the lab procedure, the NATEF task, the school, the student and the student's performance. It is also imperative that you include prompts for the students to contact you to discuss the activity. A simple statement requiring your initials will cue the students to stop the activity and call you to review their work. Doing this will allow you to

review their work and use questions to check learning before the students move on. This will simplify the grading procedure. If you have already verified the student's performance by initialing their lab sheet, a quick review for completeness is all that is needed when grading.

College Name
AUMT1319 Engine Repair
Instructor Name
(800) 867-5309

RO#: 1
Score:
Date: 05/13/03
Level: 2

Repair Order

Student/Group Information

Name:_____ ID#_____

Group:_____

Vehicle Information

LIC#: BHC-61
VIN# 2G4WS52J22104633
Year: 2002 Make: Buick
Model: Century Color: Bronze

Objective: Perform cooling system pressure test.

Test Description/Procedure

Caution

To avoid being burned, do not remove the radiator cap or surge tank cap while the engine is hot. The cooling system will release scalding fluid and steam under pressure if radiator cap or surge tank cap is removed while the engine and radiator are still hot.

1. Remove radiator cap and connect J24460-01 to cooling system.
2. Pump J24460-01 to pressurize system. How much pressure should be attained?

   _____

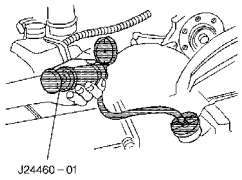
3. Inspect the cooling system for leaks. At what locations should you inspect?

   _____

   _____

   _____

   _____



4. Have your instructor inspect your work (initials) _____

Instructor Notes

Safety	Quality	Productivity
___ Wears safety glasses	___ Consults service manual	___ Is prepared
___ Uses safety equipment	___ Uses proper tools	___ Keeps busy
___ Maintains clean work area	___ Uses fender covers	___ Plans work in advance
___ Wears appropriate clothing	___ Respects vehicle	___ Works efficiently
___ Displays appropriate behavior	___ Shows concern for quality	___ Follows procedures

X = Unsatisfactory

One of the important facets of writing your own lab is that you can tailor it to your particular need. If you are writing a lab for an introductory course, you might include only low-level awareness questions. If this is a core component of a course, you could include more in-depth questions and activities. You could also use the lab sheet as a guide for developing a student's diagnostic abilities on an application level. As a matter of fact, you may find it most beneficial for higher level activities that change often with changes in vehicle technology. When writing a new lab sheet keep in mind the learning objective of the student. What information, skill or experience do you want the student to take from the activity?

Bloom's Taxonomy guides us in writing questions for worksheets, labs and tests. Start with knowledge level questions, work up to comprehension and on to application. Then when the students are performing at the application level, push them up to analysis. This method continues, planned through the entire curricula until graduation. Knowledge questions will include matching, listing and naming. Comprehension questions expect some explanation, paraphrase, or discussion of the issue. Application questions take portions the information learned in the lower levels and have the students apply it in a real world situation. Here are some examples of different level questions.

Knowledge/comprehension:

Level 1 activities and questions will use verbs like list, match, name, define.

List the components contained in the 5.3L engine block.

Name the four strokes of the four stroke cycle.

Define the following terms.

Match the parts with their corresponding function.

Application/analysis:

Level 2 activities and questions will use verbs like perform, disassemble, test, explain, measure.

What tool is used to check the worm shaft pre-load on a recirclating ball steering gear?

What are the three causes of tire wheel vibration?

What are the steps to piston installation?

Disassemble the second clutch assembly.

Synthesis/evaluation:

Level 3 activities and questions will use verbs like analyze, diagnose, evaluate, build, assemble.

A vehicle has one headlamp on dim. The other headlamp is normal. What are **NOT** the possible causes of this concern?

During the assembly of the 4L60-E transmission the technician notices excessive wear on all friction devices. What component group is most likely responsible and why?

Worksheets

Worksheets are different from lab sheets in purpose and design. A worksheet is best when there needs to be more elaboration of the materials or if you want to include pictures, graphs, or detailed explanations of the instructions or content. These may be referred to as instruction sheets as well, because they frequently include detailed instructions for performing repair procedures. Worksheets work well to expose and familiarize students to new procedures and systems. Write a worksheet only if the material warrants extra exposure and if there is not have a prewritten instruction sheet from a publisher or manufacturer available.

The decision to use a worksheet or a lab sheet in conjunction with published service manual procedures is strictly up to you. You will want to consider the scope of the activity as well as the availability of existing materials. Use a worksheet if the content is extensive, if the service information is incomplete, or you want to embed additional references within the activity.

Included with this workbook is a template to be used for either worksheets or lab sheets. It is found on the accompanying disk. It is a Microsoft Word® document template and can be used effectively for creating worksheets and lab sheets for your classes. Look for it under the name Repair Order.

Conventions

Keyboard buttons are designated in the instructions with all CAPS, or capital characters.

Commands using a + indicate pressing and holding the first key then pressing the remaining keys. For example: CTRL + C means, press and hold the CTRL key, then press the C key.

Commands using a , indicate pressing the keys sequentially. For example ALT, F, A means, press the ALT key, then press the F key, then press the A key, one after the other.

Forms

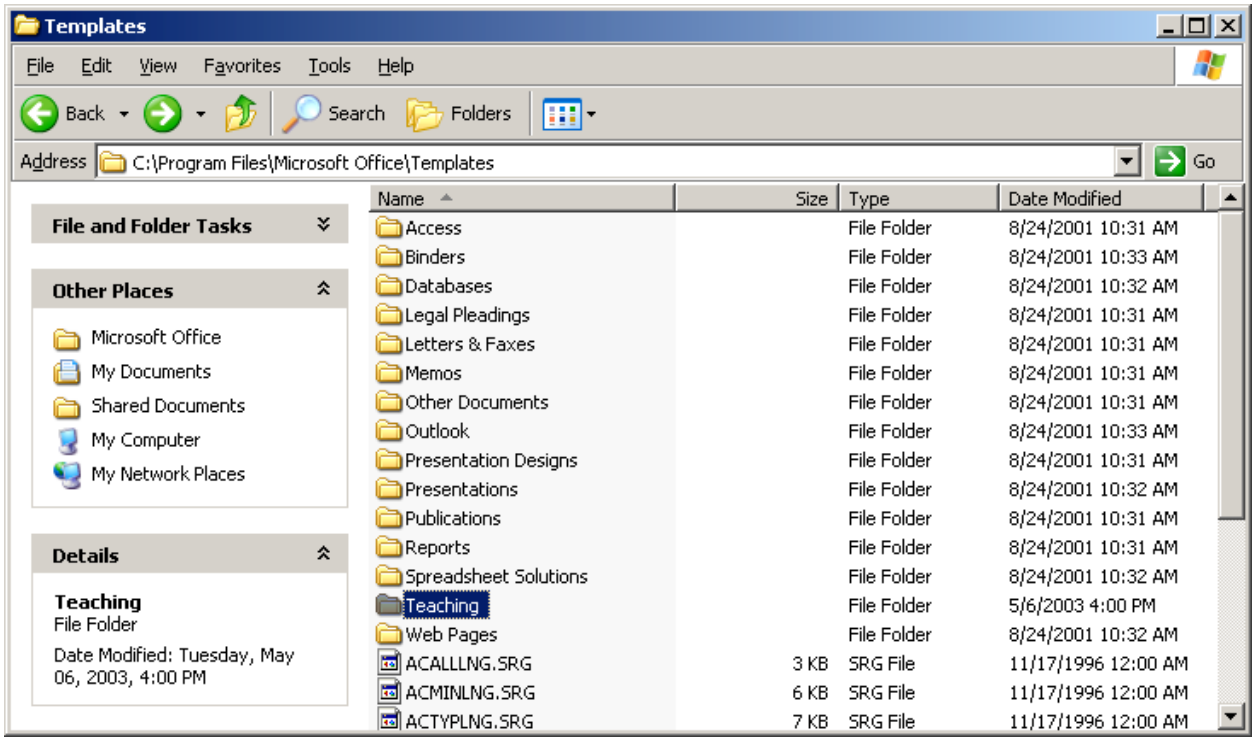
The **Repair Order** template can accommodate an almost infinite number of worksheets, far more than you will need. The template is set up for twenty worksheets. This should be plenty for the course and corresponds with the number of skill objectives provided in the grade sheet. If you think you need more, reconsider whether some of the skills are really in the knowledge domain. If you still want more, you can copy and paste existing worksheets within the Repair Order document.

Set-up

You can run the **Repair Order** software template from the CD, a floppy disk or hard drive. To select the templates from the New Office Documents on the Start Menu, add the templates to a new template folder.

1. Using Windows Explorer, create the Teaching file folder using the path C:\Program Files\Microsoft Office\Templates.

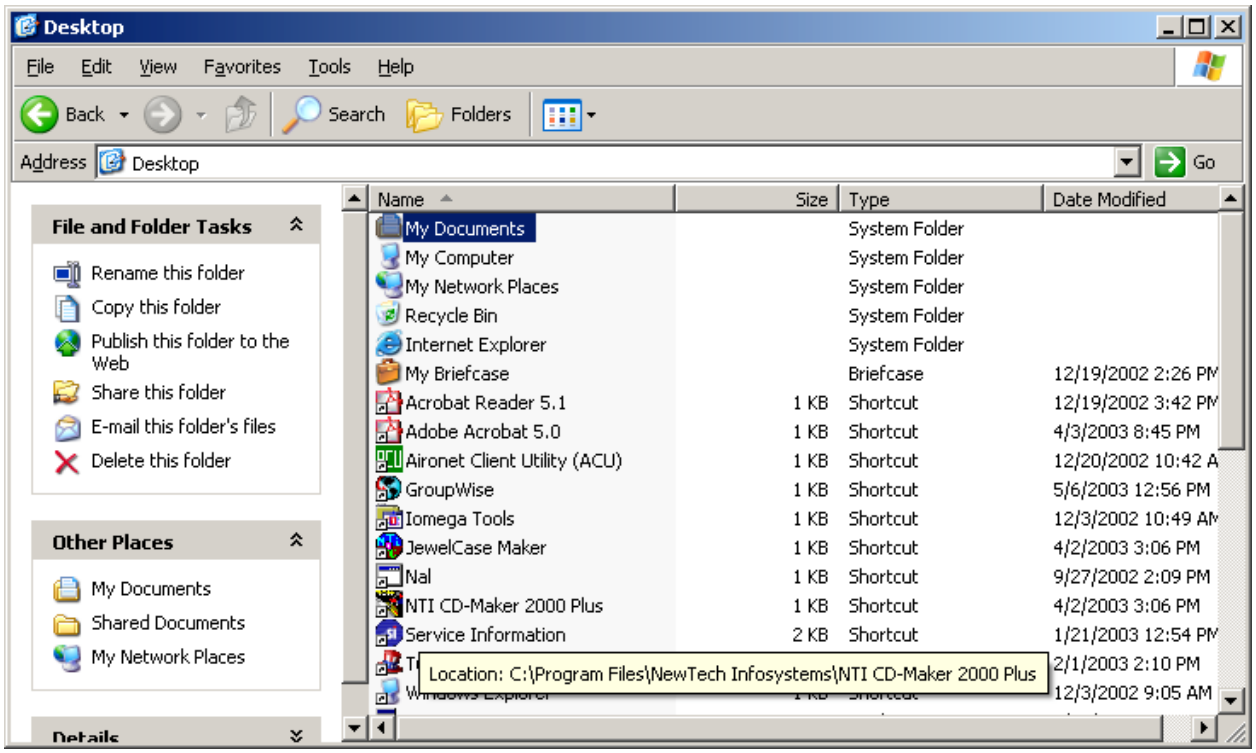
2. Copy the teaching template files to the new folder.



Set-up

To select the templates from the My Documents folder, add the templates to the My Documents folder.

1. Using Windows Explorer, copy the templates file folder and its contents the My Documents folder on your hard drive.



Naming the Repair Order

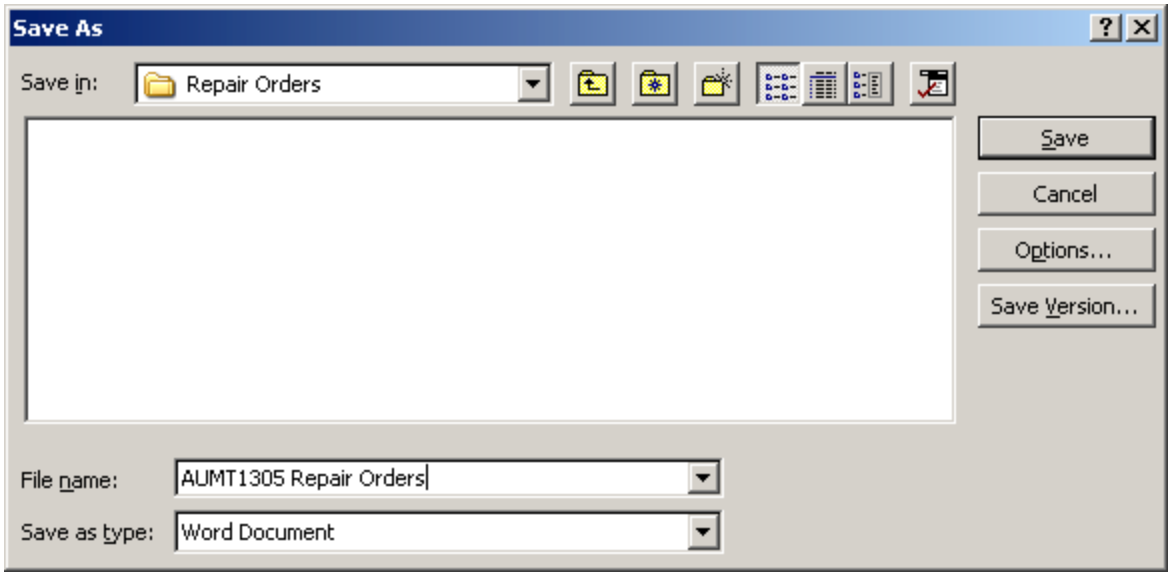
1. Open the **Repair Orders**.dot document.

2. From the File menu, select Save As….

3. Select the desired folder to save your work.

4. Name your course lab sheet document. I recommend using the format AUMTXXXX Repair Orders.doc. (XXXX = course number.)

5. Click Save.



Editing the Header and Footer.

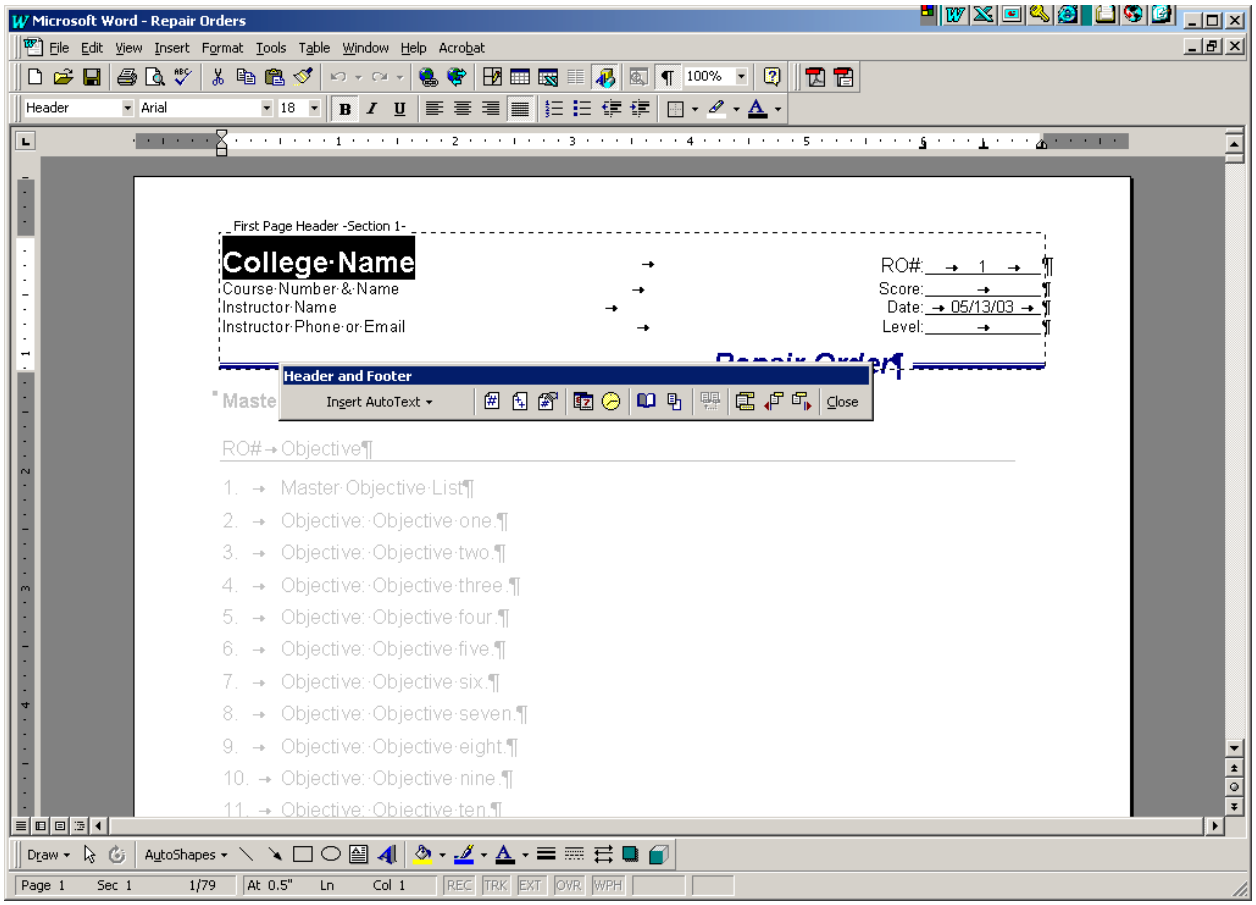
1. Double click the header at the top of the first worksheet.

2. Highlight each of the header fields & type over the heading information. This information will automatically be updated to all the repair orders.

3. Click the switch to footer button on the Header and Footer tool bar. Edit the footer information. This information will be updated to all the repair orders.

4. Save your work.

HINT: A single click on the header fields highlights the field and allows editing of the information.



Editing Vehicle Information.

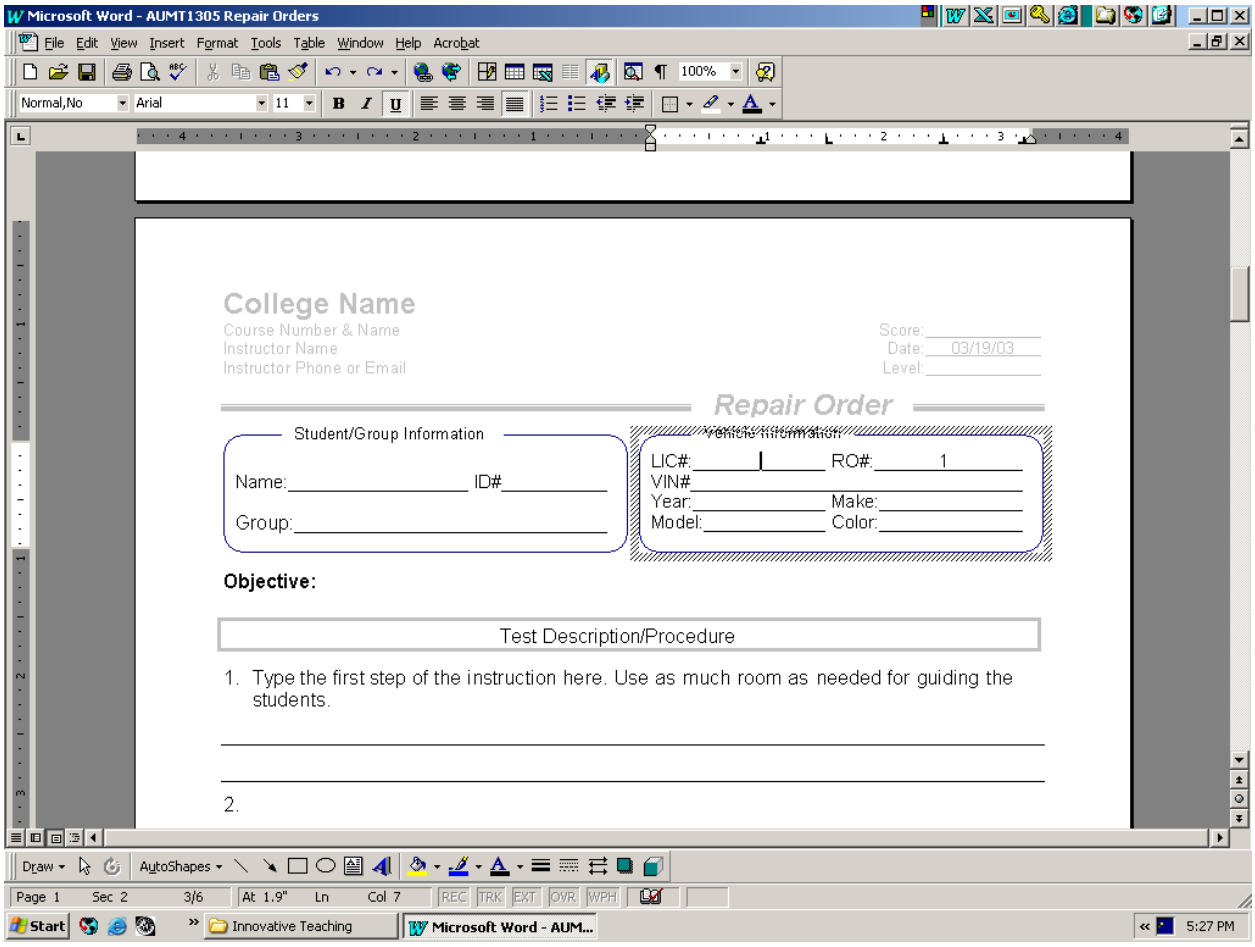
1. Click on the middle of the blank space provided to edit the vehicle information.

2. The vehicle information is **not** updated to the other worksheets and must be added to each worksheet as it is developed.

3. Leave the student information blank.

4. Save your work.

HINT: If your program works on "live" vehicles, you may wish to leave this section blank and have your students fill in the blanks from their vehicle.



Entering the Student Instructions.

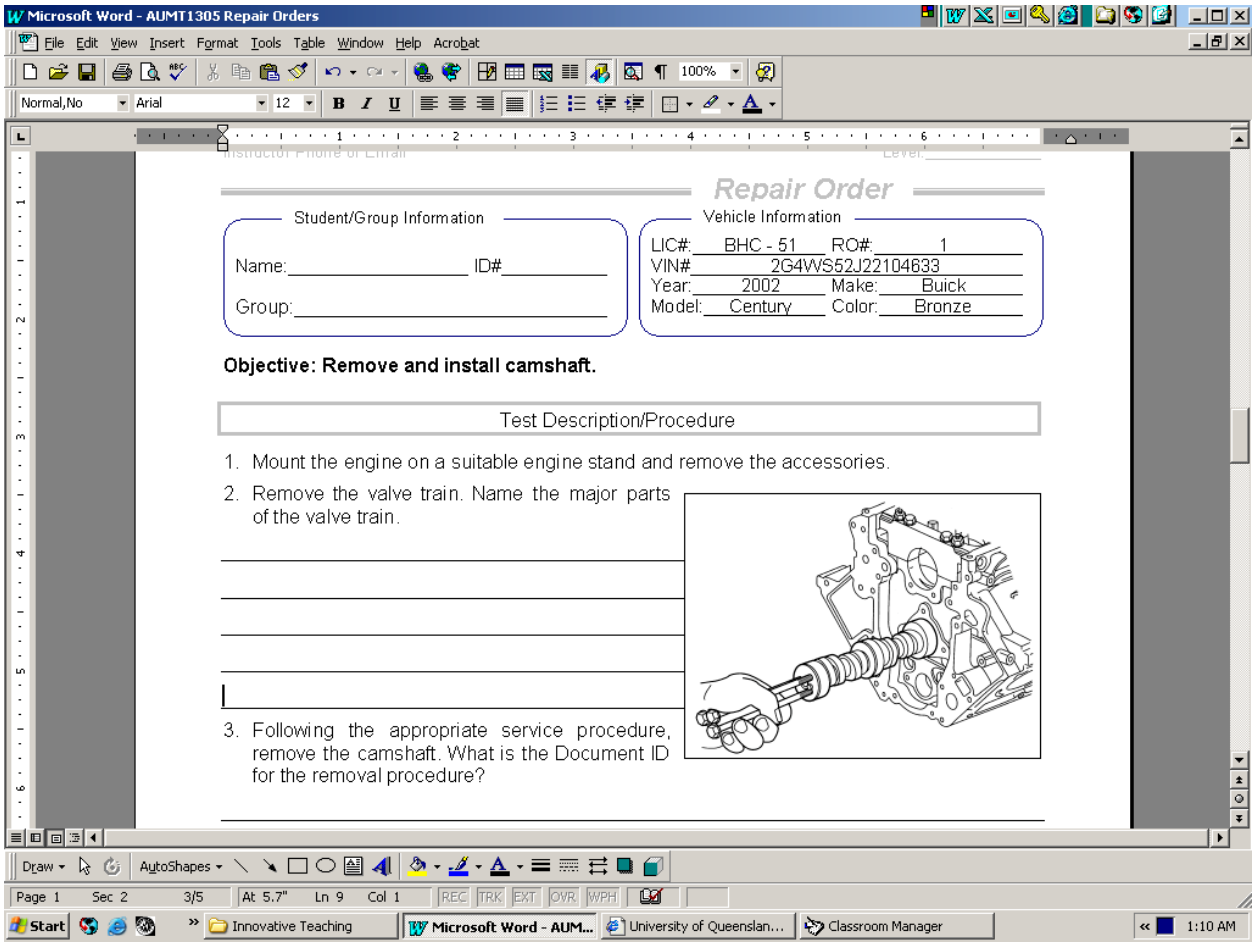
1. Click on the blank space provided to edit the student's instructions.

2. The student instructions are **not** updated to the other worksheets and must be added to each worksheet as it is developed.

3. Add and remove blank or numbered lines by selecting the desired format and pressing enter or delete.

4. Save your work.

HINT: You can easily add graphics by selecting Picture|From File… from the Insert menu..



Handouts

Handouts are written to cover specific content. Write a handout to focus the student's attention on a specific procedure or content. In order to utilize the handout effectively, a lab sheet and quiz should also be developed to guide student activity and measure student understanding. A well-developed handout is the basis for a complete learning activity. If you treat your textbook as a compilation of handouts, you could organize the published materials for the foundation of your course, then develop additional handouts to provide remediation and enrichment opportunities for your students.

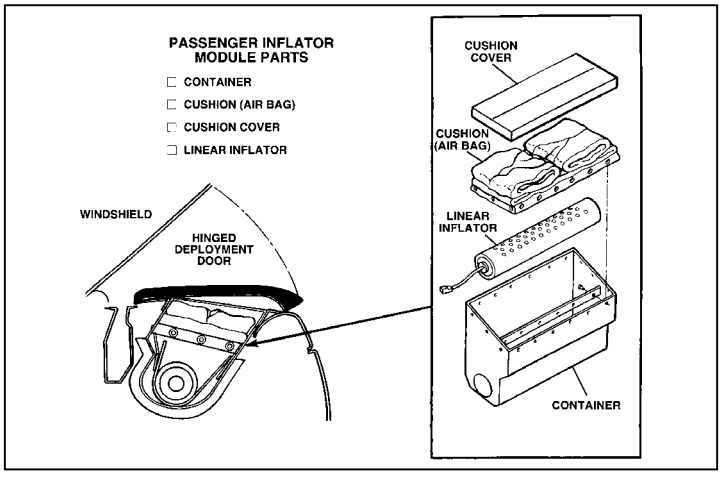
SIR System Operation

An SIR system's general operation is easily described. A vehicle is fitted with deceleration sensors which will identify a frontal collision. In a severe frontal collision, the deceleration sensors trigger a highly developed small explosive device. This device sets off a chemical reaction which rapidly generates nitrogen gas which inflates the inflator module. Nitrogen makes up about 79.8% of the air we breath. As with many chemical reactions, some byproducts are generated; these by-products are not hazardous to the vehicle's occupants.

The SIR system deflates almost immediately after inflating, allowing the occupants to move about freely. Because the SIR system is simple to begin with, and highly tested, the chances of accidental activation are virtually nonexistent.

SIR system components are:

- Inflator module
- Arming and discriminating sensors (deceleration sensors)
- Resistor module
- Indicator light
- SIR coil
- Diagnostic Energy Reserve Module (DERM) or
- Sensing and Diagnostic Module (SDM)



Evaluation

Evaluation is a tool and a methodology the instructor uses to determine, define and communicate student's ability and progress. The type of assignment as well as the expected performance drives evaluations. When you talk about evaluations, you aren't just talking about tests. Students need to be evaluated on daily performance of affect and skill as well as summary performance of knowledge. As a matter of fact it would be virtually impossible to give individual testing for all the performance you expect your students to demonstrate. We will explore various types of evaluation methods and apply them to different performance criteria.

The assignment evaluation is used primarily as a progress tool. Is the student performing the assigned task? Or, more importantly, at what level is the student performing the assigned task? This evaluation method lends itself to affect and skill evaluations where the expected behavior is observable on an on-going basis. You should build this into the assignments whenever possible. When you place predetermined intervention prompts in your lab assignments, you provide the opportunity for the student to receive immediate feedback that is critical to their development. It also give you the opportunity to intervene in a more timely manner as well as simplify the grading process.

Exams, tests and quizzes are typically used to assess a student's ability to independently perform the assigned tasks or explain the assigned concepts. These are the summary evaluations. They work well for skill or knowledge objectives and are not limited to written formats. They can be used very effectively to measure independent skill performance of students in the shop. The down side to this type of testing is that it is very time consuming.

The trick to effective evaluations is to be prepared and have your students prepared. Have checklists of desired observable behavior with you during class. Make sure your students know what you are looking for. Give them the opportunity to practice what you want them to practice. Be lenient with them as they are developing the habits. It will be necessary to consistently re-direct at least a few of them. Schedule the summary exams ahead of time and try to be as clear as possible as to the content of the test. If you are teaching what you want them to learn and you are testing them on what you want them to learn, then you should be teaching the test!

On the next few pages is a document created by the American Association for Higher Education. It was developed under the auspices of the AAHE Assessment Forum with support from the Fund for the Improvement of Post-secondary Education with additional support for publication and dissemination from the Exxon Education Foundation. Copies may be made without restriction. It is included here to promote thoughtful consideration of evaluation as a tool to promote growth and understanding from students and instructors alike.

1. **The assessment of student learning begins with educational values.** Assessment is not an end in itself but a vehicle for educational improvement. Its effective practice, then, begins with and enacts a vision of the kinds of learning we most value for students and strive to help them achieve. Educational values should drive not only *what* we choose to assess but also *how* we do so. Where questions about educational mission and values are skipped over, assessment threatens to be an exercise in measuring what's easy, rather than a process of improving what we really care about.

2. **Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed in performance over time.** Learning is a complex process. It entails not only what students know but what they can do with what they know; it involves not only knowledge and abilities but values, attitudes, and habits of mind that affect both academic success and performance beyond the classroom. Assessment should reflect these understandings by employing a diverse array of methods, including those that call for actual performance, using them over time so as to reveal change, growth, and increasing degrees of integration. Such an approach aims for a more complete and accurate picture of learning, and therefore firmer bases for improving our students' educational experience.

3. **Assessment works best when the programs it seeks to improve have clear, explicitly stated purposes.** Assessment is a goal-oriented process. It entails comparing educational performance with educational purposes and expectations -- those derived from the institution's mission, from faculty intentions in program and course design, and from knowledge of students' own goals. Where program purposes lack specificity or agreement, assessment as a process pushes a campus toward clarity about where to aim and what standards to apply; assessment also prompts attention to where and how program goals will be taught and learned. Clear, shared, implementable goals are the cornerstone for assessment that is focused and useful.

4. **Assessment requires attention to outcomes but also and equally to the experiences that lead to those outcomes.** Information about outcomes is of high importance; where students "end up" matters greatly. But to improve outcomes, we need to know about student experience along the way -- about the curricula, teaching, and kind of student effort that lead to particular outcomes. Assessment can help us understand which students learn best under what conditions; with such knowledge comes the capacity to improve the whole of their learning.

5. **Assessment works best when it is ongoing not episodic.** Assessment is a process whose power is cumulative. Though isolated, "one-shot" assessment can be better than none, improvement is best fostered when assessment entails a linked series of activities undertaken over time. This may mean tracking the process of individual students, or of cohorts of students; it may mean collecting the same examples of student performance or using the same instrument semester after

semester. The point is to monitor progress toward intended goals in a spirit of continuous improvement. Along the way, the assessment process itself should be evaluated and refined in light of emerging insights.

6. **Assessment fosters wider improvement when representatives from across the educational community are involved.** Student learning is a campus-wide responsibility, and assessment is a way of enacting that responsibility. Thus, while assessment efforts may start small, the aim over time is to involve people from across the educational community. Faculty play an especially important role, but assessment's questions can't be fully addressed without participation by student-affairs educators, librarians, administrators, and students. Assessment may also involve individuals from beyond the campus (alumni/ae, trustees, employers) whose experience can enrich the sense of appropriate aims and standards for learning. Thus understood, assessment is not a task for small groups of experts but a collaborative activity; its aim is wider, better-informed attention to student learning by all parties with a stake in its improvement.

7. **Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.** Assessment recognizes the value of information in the process of improvement. But to be useful, information must be connected to issues or questions that people really care about. This implies assessment approaches that produce evidence that relevant parties will find credible, suggestive, and applicable to decisions that need to be made. It means thinking in advance about how the information will be used, and by whom. The point of assessment is not to gather data and return "results"; it is a process that starts with the questions of decision-makers, that involves them in the gathering and interpreting of data, and that informs and helps guide continuous improvement.

8. **Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change.** Assessment alone changes little. Its greatest contribution comes on campuses where the quality of teaching and learning is visibly valued and worked at. On such campuses, the push to improve educational performance is a visible and primary goal of leadership; improving the quality of undergraduate education is central to the institution's planning, budgeting, and personnel decisions. On such campuses, information about learning outcomes is seen as an integral part of decision making, and avidly sought.

9. **Through assessment, educators meet responsibilities to students and to the public.** There is a compelling public stake in education. As educators, we have a responsibility to the publics that support or depend on us to provide information about the ways in which our students meet goals and expectations. But that responsibility goes beyond the reporting of such information; our deeper obligation -- to ourselves, our students, and society -- is to improve. Those to whom educators are accountable have a corresponding obligation to support such attempts at improvement.

Subtopic III: Using Grade Book

A Grading Model

Now that we have defined course content and activities, it is time to discuss grading. This is the part of teaching which many instructors struggle. Remember to keep your advisory committee involved in the discussion that creates and defines the grading system as a tool used to communicate student performance. After all they are the ones who will be consuming your product of trained technicians. Meeting their criteria of performance is essential to the vitality of your program.

The goal I have for grading is to assign grades that reflect the student's overall performance in the course. One of the first things you need to do is to define for yourself what you believe each letter grade means in terms of the student performance. Because a letter grade is a summary of performance, not the detailed student summary, it should be defined in terms of overall performance. Your school may have already defined each letter as a general measure of performance. If you are to use that make sure you know what it is, so the grades you are providing are consistent. For our discussion, let's define the scale.

An A grade is the highest grade a student can earn. It should be reserved for students who perform at a very high level. Many schools define this level of performance as excellent. This should be reserved for those students who do something to set themselves apart from the crowd.

The next grade is a B. A B grade reflects very good performance, but not the excellent performance reserved for the A. This group of students will have consistently good performance on the core content and may have some work in the enrichment area, but may also indicate weakness in certain areas.

The next grade is sometimes perceived as somehow deficient. However, if you look at the definition of most schools, a C is not deficient, but a grade used for achieving average performance on the core content. If you accept this as the standard, it may be easier to answer those students when they ask, "What will it take for me to get a C?" The answer should be "Competent completion of all the core content of the course." When you think of it in these terms, student performance of a C becomes much more palatable for instructors that expect good performance from all their passing students.

The next score is on that slippery slope of the no-mans land of deficient performance and satisfactory grade. The D grade is one that is characterized as unsatisfactory or below standard. This is a slippery slope because most schools have this grade to indicate deficient performance, yet accept it as a passing grade. Somehow this does not fit. If your program is producing technicians ready for the workforce, how could a D

grade be a passing score? Schools may decide to handle this in different ways, but even if they decide to avoid or ignore the issue it does not mean that you have to award D's in your courses. If a D grade is not defined in your course, how could a student possibly earn one?

Lastly, and in this case definitely least, is the infamous F. The letter grade conjures up those devastating feelings of failure. Yes, an F grade does mean failure, but only in the limited context of the course content and time constraints. An F does not mean the student cannot be taught or trained, it means the course goals were not satisfactorily completed in the allotted time.

Students with this grade need to be evaluated and counseled in terms of why the performance was below standard. This conversation is important because from it you will have to determine the student's future in your program. Many times you will find the deficiency is not the student's ability to perform. Personal problems with family relationships, financial commitments, study habits or commitment issues related to their desire to be in your program may need addressing. If the problem is related to financial concerns or study habits, refer them to the appropriate resources at your college to help alleviate these concerns. If the problem is commitment, the best you may do for the student is to help them discover their personal goals and interests. Don't think of it as loosing a failing student from your program, but gaining a successful student for the college.

This all begs the question, how do you define grades in your course?

If you accept the notion that a C is the lowest passing grade, then you can pretty much narrow the question to how you define an A or a B. If a C is the lowest passing grade, then what performance is passing? Each instructor must determine this for his or her own courses. A C defines the student performance as minimally competent. This means that a passing student has demonstrated proficiency in the core content of the course. If a student demonstrates this competency and performs in some additional way that may constitute a B. Maybe the student completes more exercises or does the required work with better efficiency. All these things are for you to decide.

Once you have your evaluation methodology developed, you will need to develop a way of capturing the information gained from the evaluations. To be effective, you will need to gain information about your students' performance from the evaluations and be able to communicate it to them. The next section will show you a tool for doing just that.

The goal for the grade book was twofold. It provides a printout of the permanent record for the college and a printout for the students to use to analyze their performance. It is also correlated to the other course documents. Microsoft Excel® was used to create the grade book because of its ability to crunch numbers and link worksheets together. The grade book delivers a comprehensive tool for doing this.

Purpose

The purpose of this software is to have **Grade Book** track student progress so anytime during a course the instructor can present an evaluation report to the student. The evaluation report is designed to inform the students of their progress in the class. The **Grade Sheet** and student **Summary Evaluation** report are linked together to automatically reflect the changes in grades as they occur. The idea is to have different reports for different needs, but only input student scores once.

Design

The software is designed to track a student's progress in three areas; attitude, skill and knowledge. The attitude section objectives relate to interpersonal skills. The skill section is derived from the NATEF task list. The knowledge section is for any written assignments, worksheets or exams.

The attitude addendum (affect) is a list of affective objectives and supporting DO and DON'T enabling objectives. The objectives can be anything the instructor sees fit to reinforce in their class, such as productivity, judgement, etc. The enabling objectives are stated in the DO and DON'T lists to help define the main objective.

The attitude section of the **Grade Book** rewards students for positive behavior by adding points to their final grade. It also tracks repetitive infractions of class rules that negatively impact all students. These infractions are shown on the student's summary evaluation. The attitude scores are input to the **Summary Evaluation** worksheet for individual scoring and updated to the **Grade Book** automatically. This section is limited to five objectives with four DOs and four DON'Ts each.

The skill addendum (psychomotor) is designed to track a student's progress toward completion of lab work or other skill development activities. The skill activity scores are input directly to the **Grade Book** for batch processing an entire class assignment, if needed, and updated to the **Summary Evaluation** worksheet automatically. This section is limited to twenty objectives.

The knowledge addendum (cognitive) is designed to track a student's progress toward completion of cognitive objectives such as homework, class assignments or tests. The knowledge activity scores are input directly to the **Grade Book** for batch processing an entire class assignment, if needed, and updated to the student **Summary Evaluation** worksheet automatically. This section is limited to twelve objectives.

Conventions

Keyboard buttons are designated in the instructions with all CAPS, or capital characters.

Grade Book forms are designated in **Bold** print text.

Commands using a + indicate pressing and holding the first key then pressing the remaining keys. For example: CTRL + C means, press and hold the CTRL key, then press the C key.

Commands using a , indicate pressing the keys sequentially. For example ALT, F, A means, press the ALT key, then press the F key, then press the A key, one after the other.

Forms

Within the **Grade Book** software are four main forms. The first form is the **Grade Sheet**. The **Grade Sheet** is similar to a traditional grade sheet with course name, student names and assignments in a spreadsheet format. The **Grade Sheet** can be printed out for record keeping purposes usually on two legal size sheets of paper, but can be formatted to fit letter size paper.

The second form is the student **Summary Evaluation** worksheet. This form is similar to a traditional progress report in which a student's progress can be reported periodically. The main benefit of this report is that it can be given to the student anytime and as often as you wish.

The third form is the **Master** worksheet. The **Master** worksheet is used to set-up the **Grade Book**. All of the attitude, skill and knowledge objectives, and their respective point values are entered into the **Master** worksheet. These items are automatically updated to the **Grade Sheet** and the student **Summary Evaluation** worksheets.

The last form is the **Daily Sign In** sheet. This sheet is designed as a daily printout enabling the instructor to track the student's daily performance. It includes a list of student names, a column for sign in, as well as sign in times and notes. The Instructor should use this as a tool to document the daily attitudinal performance of the students to support the attitude evaluation. These may be kept by the instructor as part of the permanent course documentation.

Set-up

You can run the **Grade Book** software from a floppy disk or hard drive. If you already copied the templates to the hard drive, skip to Naming the Grade Book.

1. Using Windows Explorer, copy the **Grade Book** file folder and its contents to a 3.5" floppy or a convenient location on your hard drive.

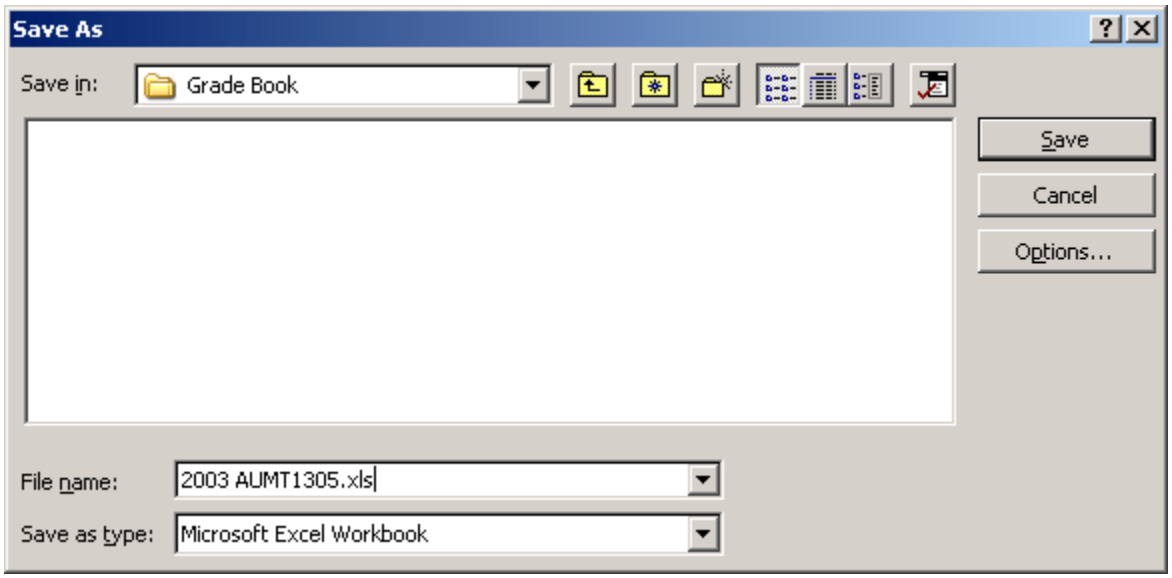
Naming the Grade Book

1. Open the **Grade Book**.xls workbook located in the **Grade Book** file folder.

2. From the File menu, select Save As….

3. Name your course grade sheet. I recommend using the format YYYY AUMTXXXX.xls. (YYYY = year and XXXX = course number.)

4. Click Save.



Renaming the Course Number on the Grade Sheet

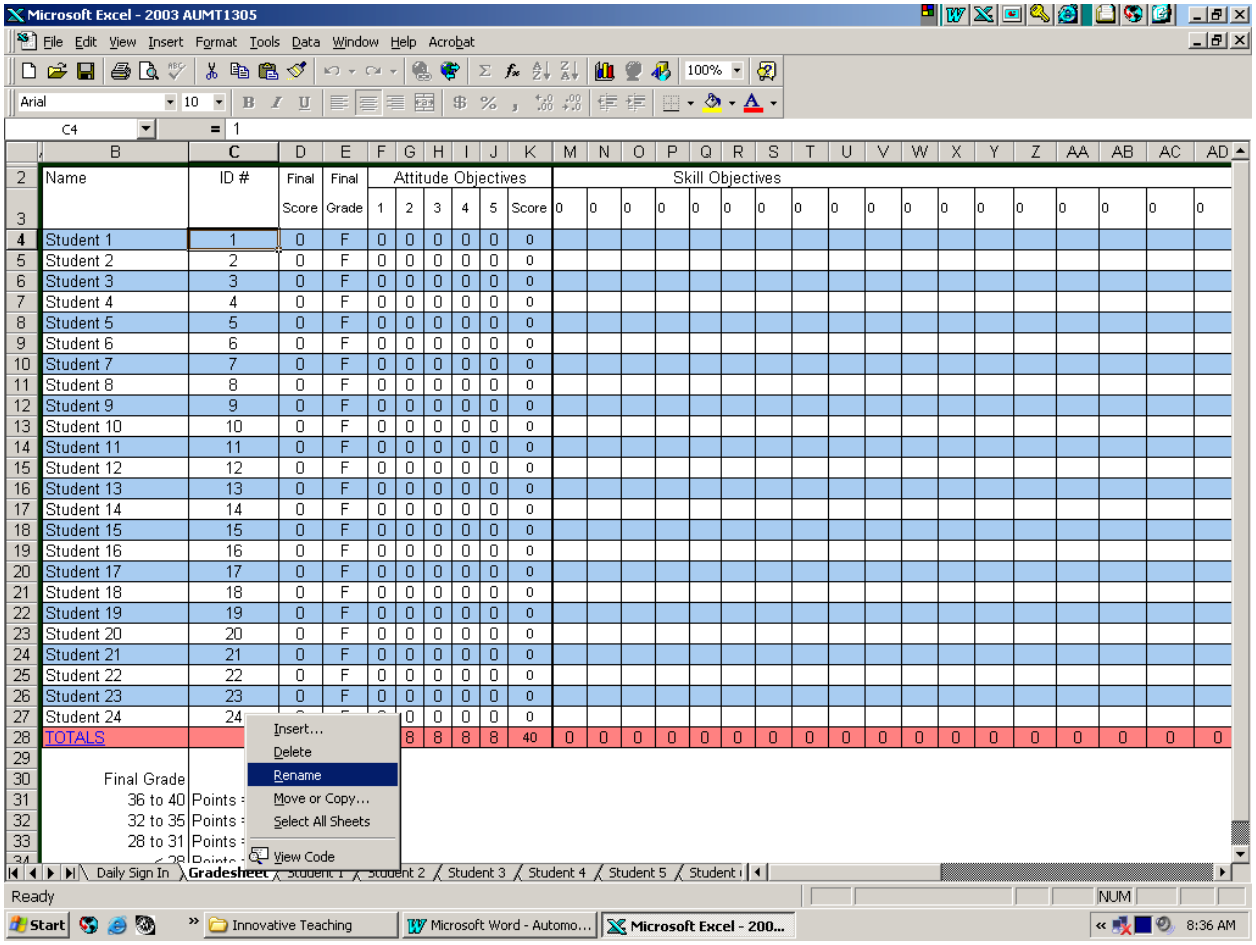
1. Right click the **Course Number** tab at the bottom of the worksheet.

2. Select Rename.

3. Type the course name “AUMTXXXX.” (XXXX = course number.) Press ENTER.

4. Save your work.

HINT: You can double click the worksheet tab and type over the highlighted **Course Number** tab.

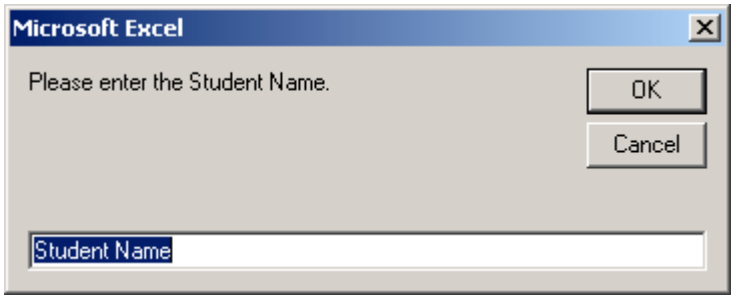


Entering Student Names and SSN's to the Grade Sheet

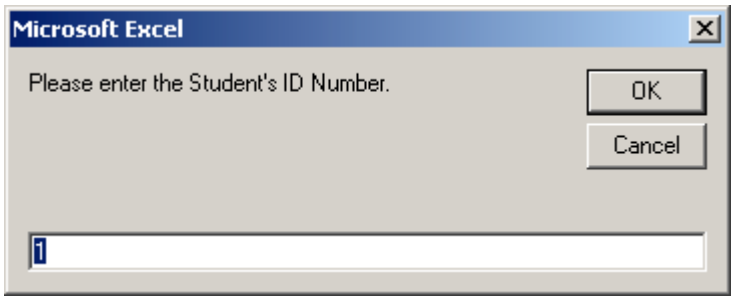
Note: Each student name must be unique because it is linked to the student **Summary Evaluation** worksheet.

1. Select the **Student Name** you wish to edit. Press CTRL + M. This starts a macro that provides dialog boxes for inputting student name and ID number.

2. Enter the student's name. Press ENTER or Click OK.

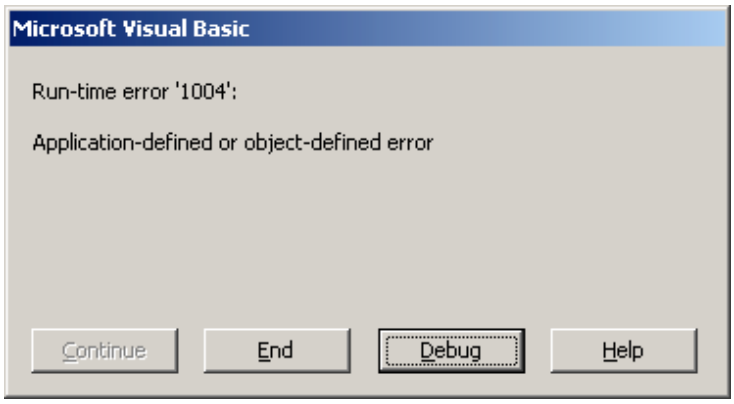


3. Enter the studen t's ID number. Press ENTER or Click OK.



4. Save your work.

Note: If the Debug message screen appears, it is usually because there is a duplicate name being used. To correct this condition, Press END. Do not try to Debug this condition. Once you select END, navigate back to the **Grade Sheet** and manually change the name back to its original name. Eliminate the duplicate name and repeat steps 1 through 4.



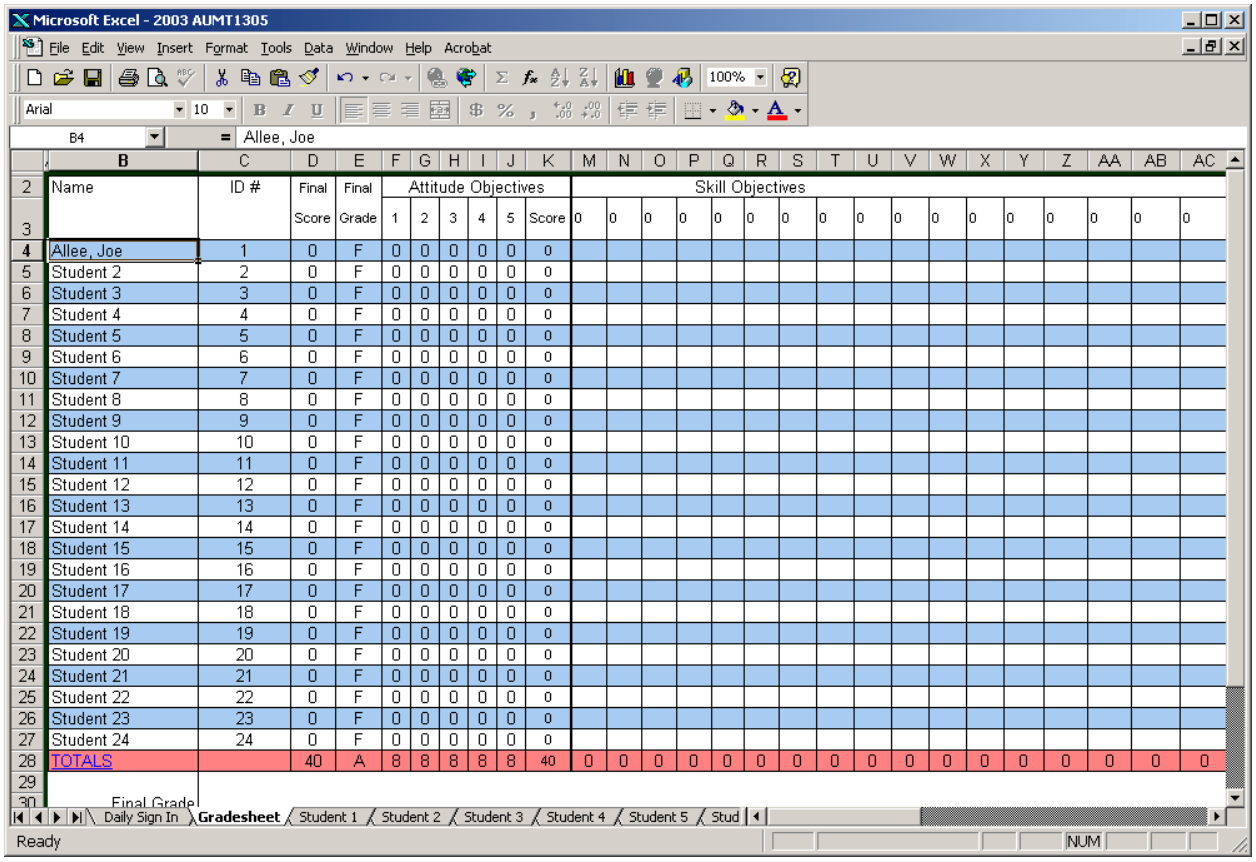
Re -linking the Student Evaluation Sheets with the Grade Sheet

This should only be necessary if the name of student **Summary Evaluation** worksheet does not match the name on the **Grade Sheet**.

1. Select the cell that either contains the duplicate student name that is to be replaced or does not match the corresponding student **Summary Evaluation** worksheet.

2. Type the student's name. (Make sure the student name on the student **Summary Evaluation** worksheet matches the name on the **Grade Sheet**.) Press ENTER.

3. Save your work.

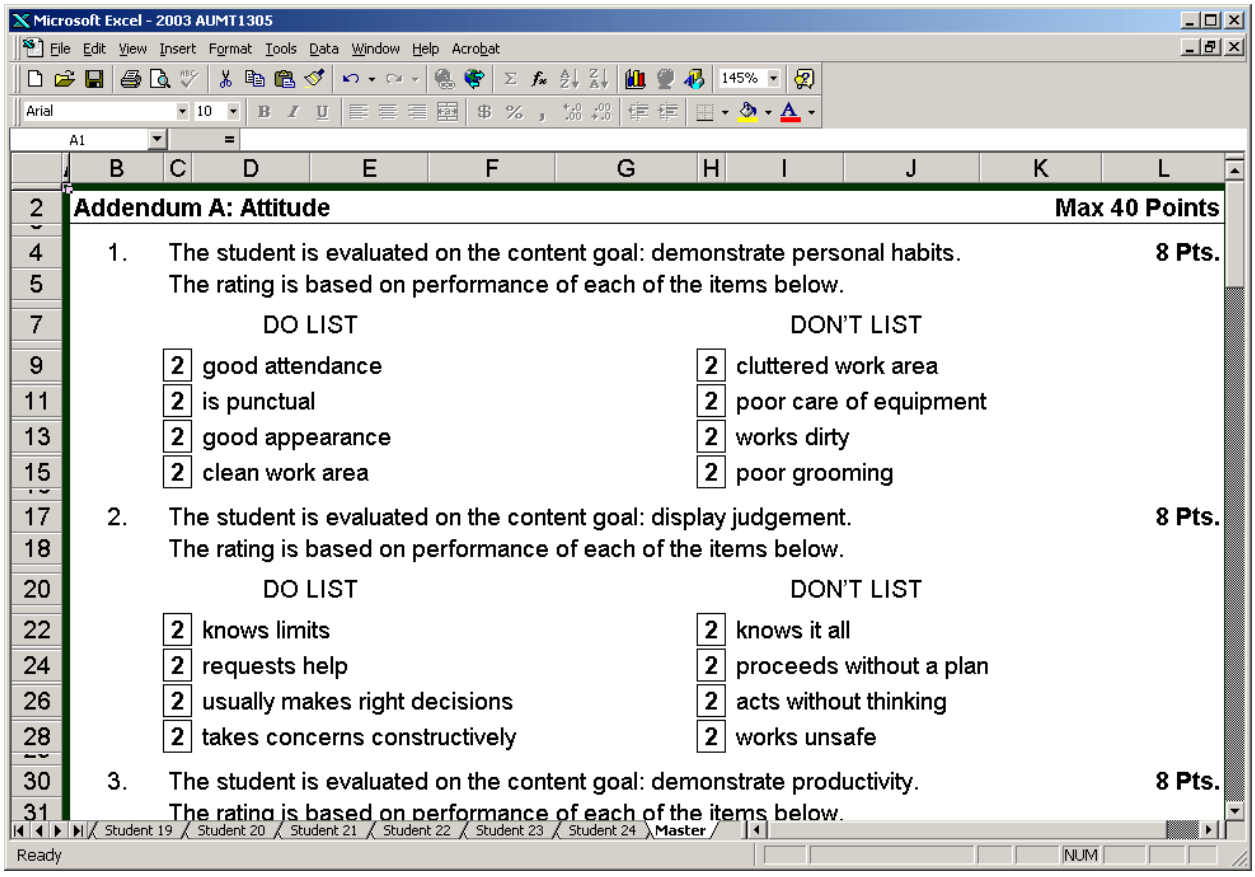


Setting up the Master Worksheet

Every instructor's course is different. While the **Grade Book** was designed to meet the needs of a particular type of course grading philosophy, adding objectives to the **Grade Book** is strictly optional. You are required to have at least one objective with a point value assigned, but since the **Grade Book** already has a default setting for attitudinal objectives no additional input is required.

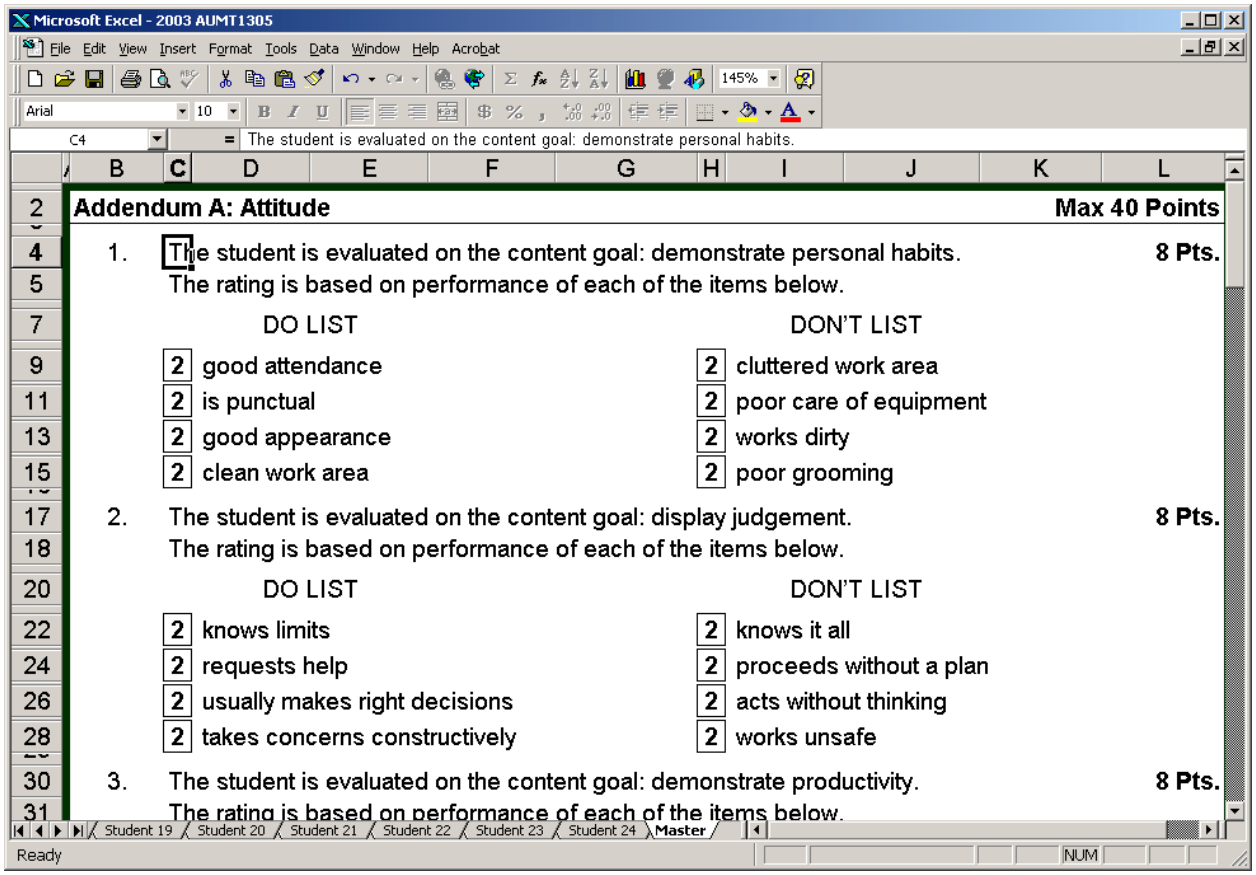
However, it is our expectation the vast majority of users will want to input at least a few objectives of their own. The following will help guide you through the process of inputting all three types of objectives and their corresponding point values.

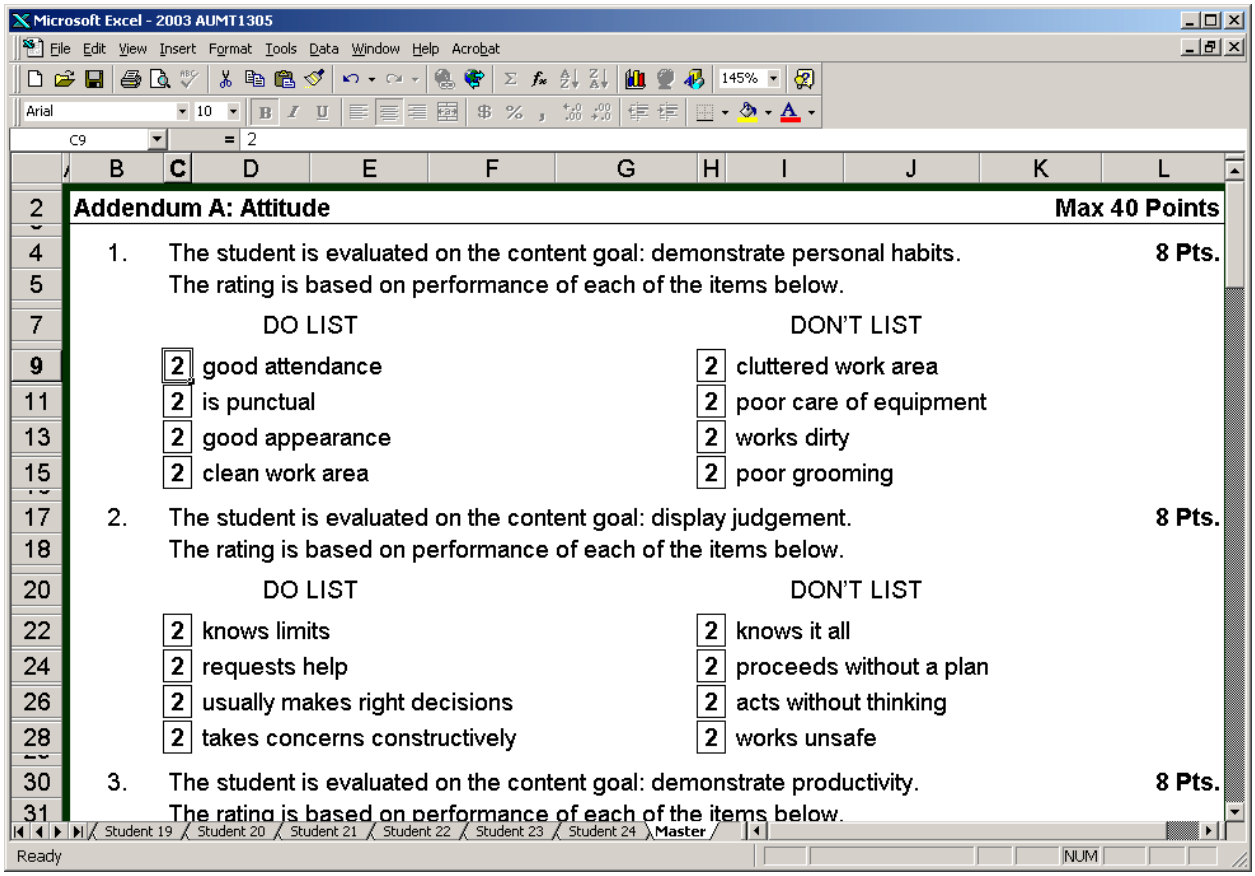
Also, the addendum headings can be edited at this time. Simply select the heading you wish to edit, then type in the new heading. The **Grade Sheet** and **Summary Evaluations** will be updated automatically.



Enter the Attitude Objectives

1. Select the **Master** worksheet.
2. TAB to the objective you wish to edit.
3. Type the objective on the two lines provided, pressing ENTER when the first line is full.





Enter the Attitude Point Values and DO and DON'T Lists

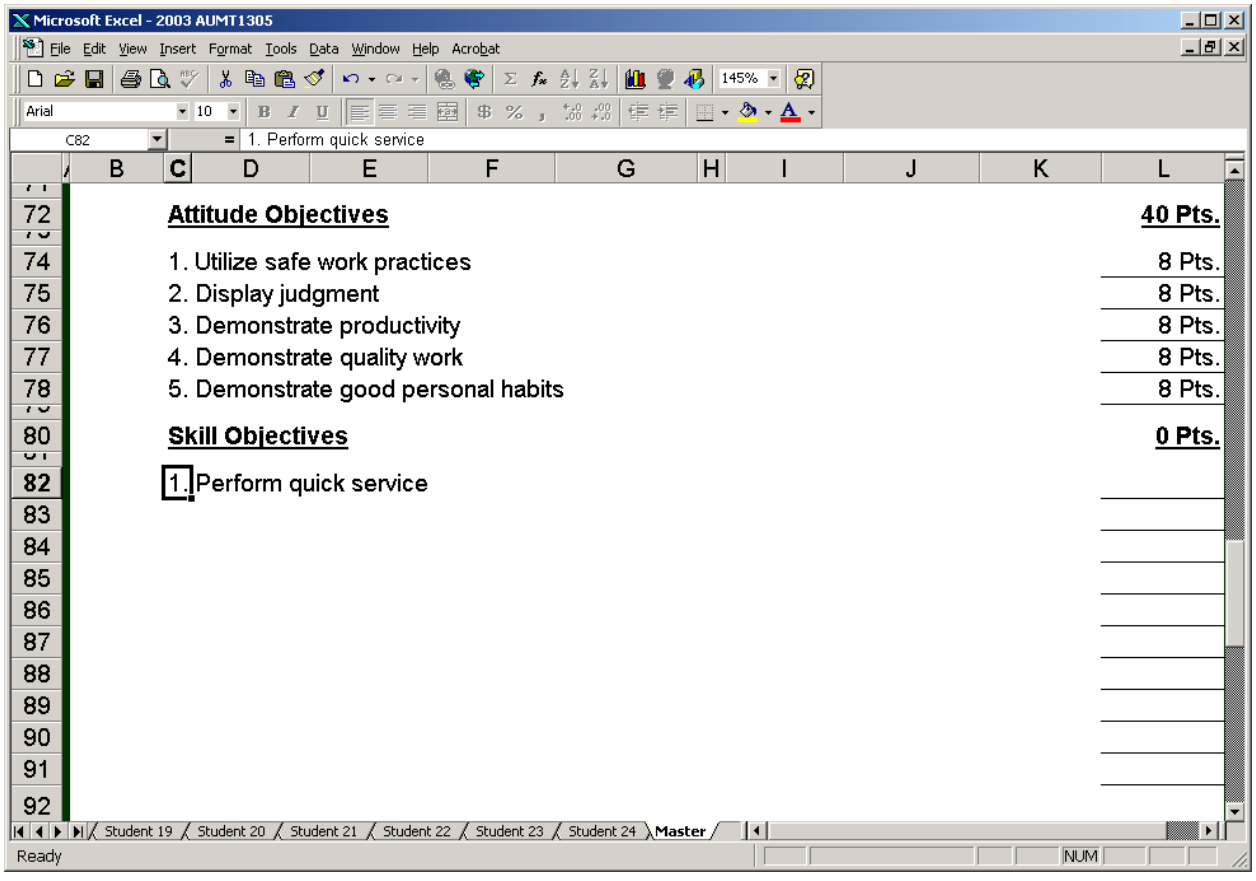
1. TAB to the box next to the DO list item you wish to edit and enter the point value for the item.
2. TAB to the DO item and enter the DO item.
3. TAB to the box next to the DON'T list item you wish to edit and enter the point value for the item.
4. TAB to the DON'T item and enter the DON'T item.
5. Repeat steps 4 through 7 for the remaining DO and DON'T items and point values.
6. Save your work.
7. Repeat all above steps until all objectives, up to five, are entered.

NOTE: You may use up to four Do or DON'T items. The point values are also optional. Only the objectives with point values will be calculated in the student's grade. All objectives will show on the student **Summary Worksheet**.

Enter the Skill Objectives and Point Values

1. Select the **Master** worksheet.
2. Find the **Skill Objectives** under the **Evaluation Summary** on page two of the **Master** worksheet.
3. Type the first skill objective for your course.
4. Press TAB and enter the point value for that objective.
5. Repeat for the remaining objectives.
6. Save your work.

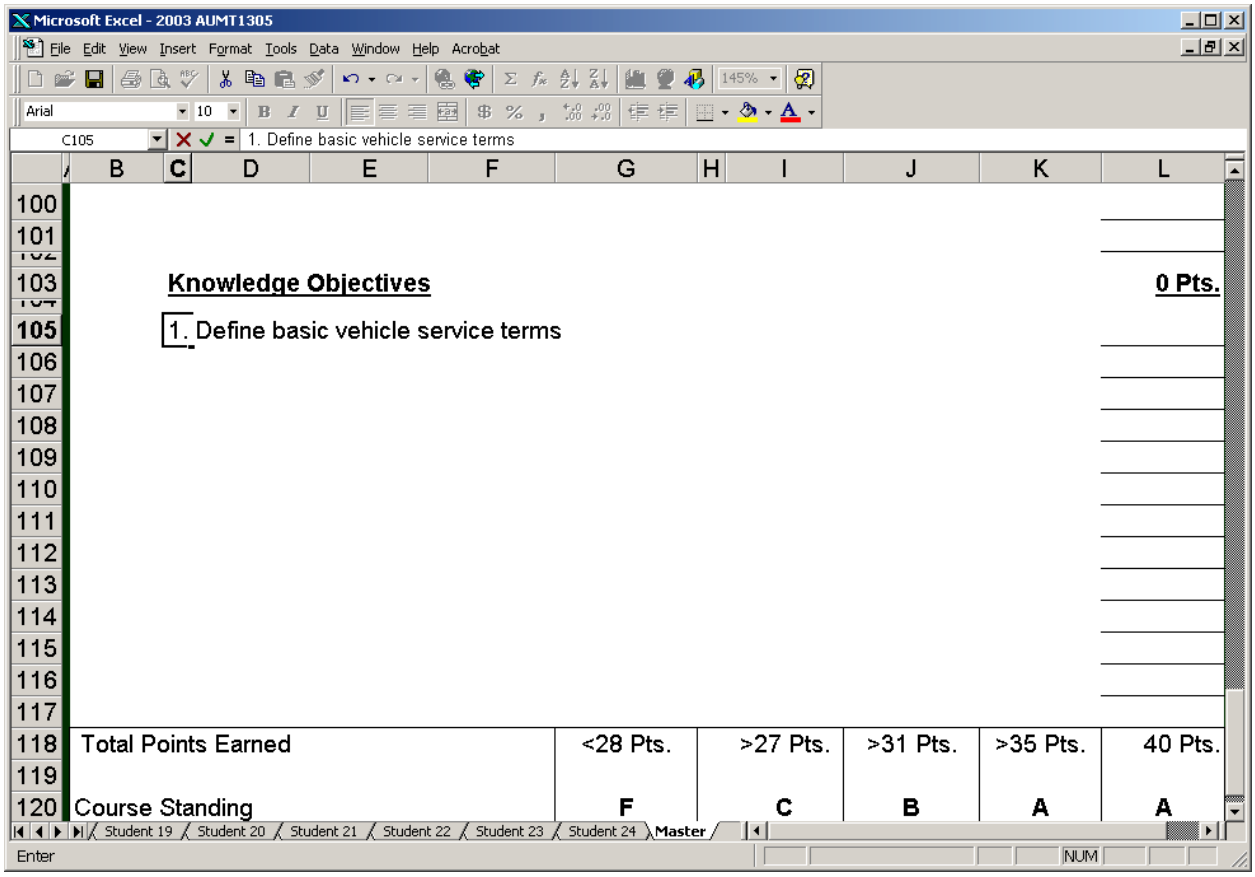
NOTE: Skill objectives are designed for manipulative or psychomotor objectives, ie: labs, while knowledge objectives are designed for cognitive assignments such as homework, tests, etc. However, you can change the addendum headings and use the objectives any way you wish. See 'Setting Up the Master Worksheet' at the beginning of this section.



Enter the Knowledge Objectives and Point Values

1. Select the **Master** worksheet at the end of the workbook.
2. Find the **Knowledge Objectives** under the **Evaluation Summary** on page two of the **Master** worksheet.
3. Type the first objective for your course.
4. Press TAB and enter the point value for that objective.
5. Repeat for the remaining objectives.
6. Save your work. You are ready to begin inputting grades.

NOTE: While skill objectives are designed for manipulative or psychomotor objectives, ie: labs, and knowledge objectives are designed for cognitive assignments such as homework, tests, etc., either may be interchanged as you wish. You are only limited by a maximum of



Attitude Evaluation

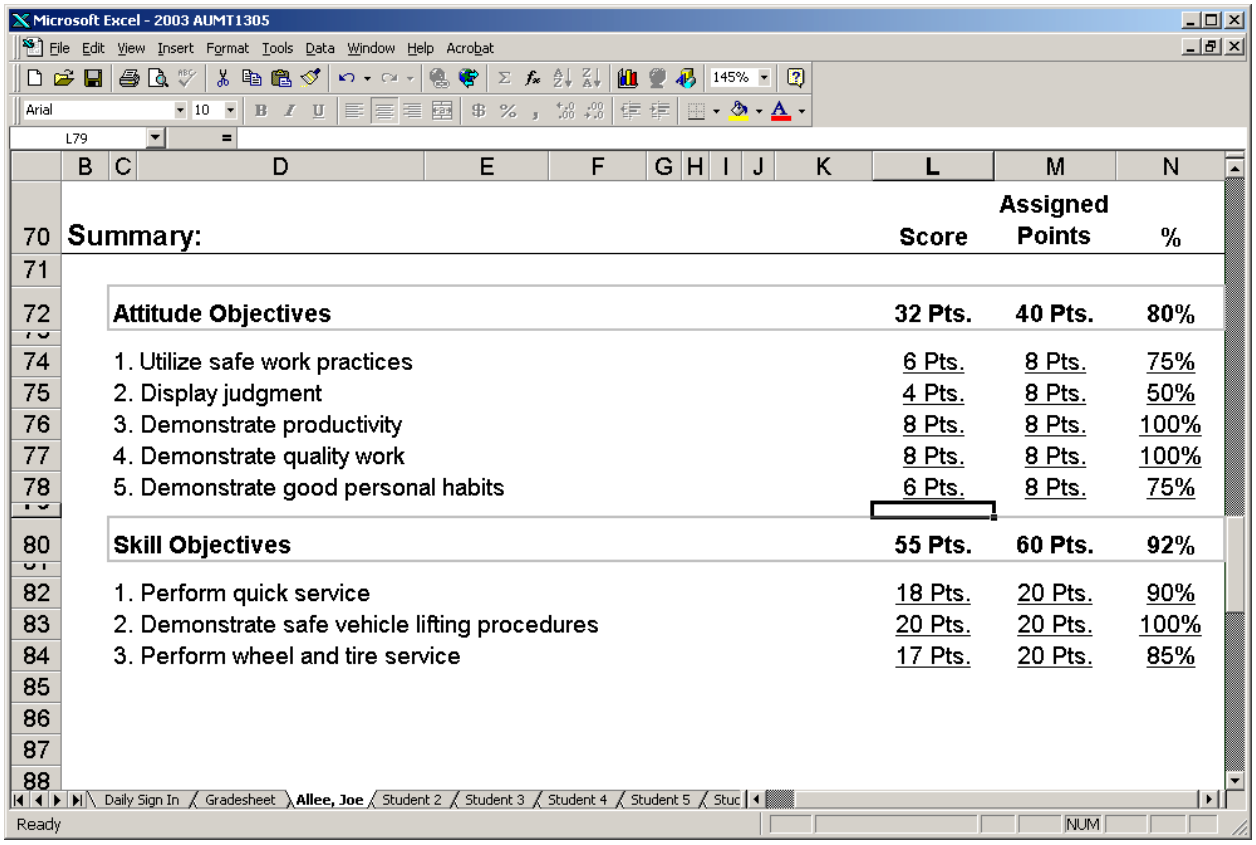
The attitude portion of the gradebook is designed to track the student's affective progress. The evaluations are completed on a student by student basis, therefore, each student must be evaluated separately.

The only way a student gets credit for appropriate behavior(s) is for the instructor to place an X on the DO list. The student will then receive the number of points you entered onto the **Master** worksheet.

For all numerical entries made to the student **Summary Evaluation** worksheet, (DO or DON'T list) the student will lose points proportional to the number of points you entered onto the **Master** worksheet.

If you placed a 2 point value on an attitude objective in the Master worksheet, the student can earn up to 2 points (for DO list items only) but could stand to lose up to 2 points times the number of infractions recorded (for all items).

The course **Grade Sheet** and **Summary Evaluation** are updated automatically.



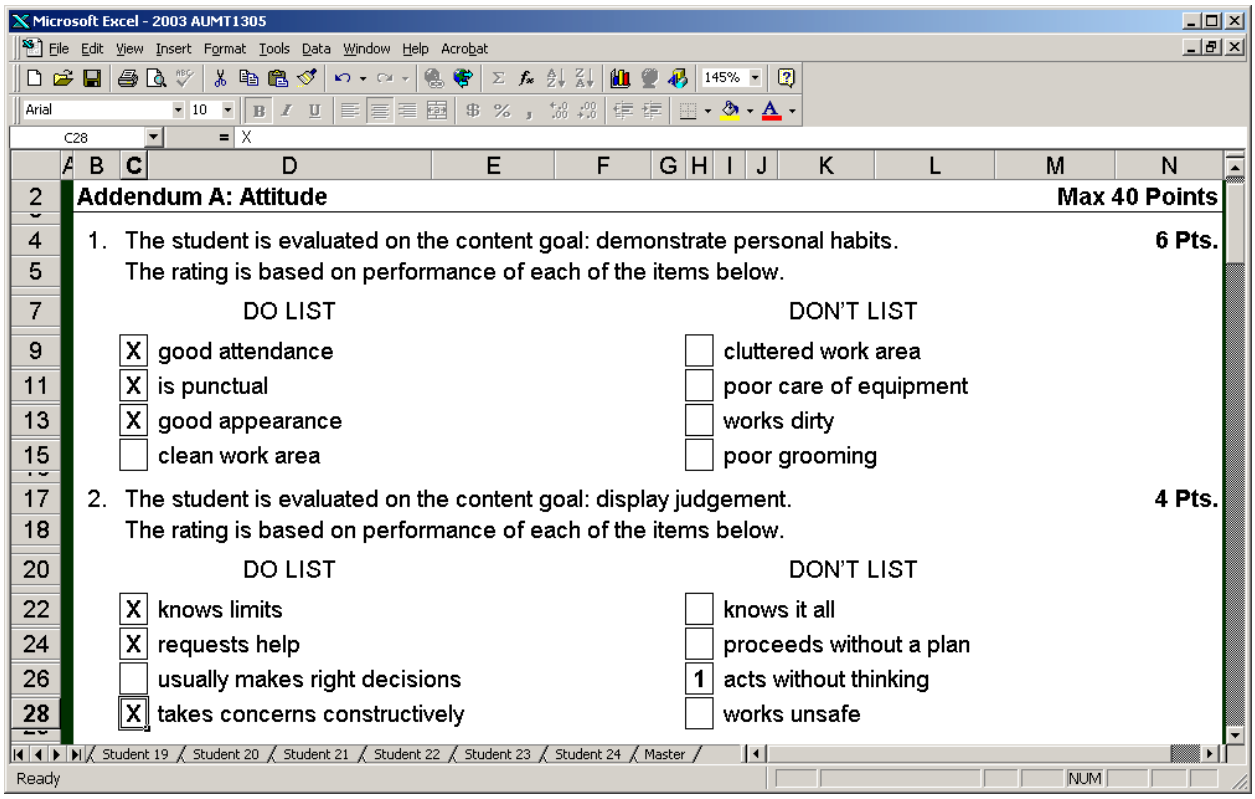
Entering the Attitude Scores

1. Open the grade book for the course to be edited.

2. Select the worksheet for the student being evaluated by clicking on the worksheet tab labeled with the student's name.

3. TAB to navigate through the available DO and DON'T lists while placing an X in the box(es) next to any DO behavior(s) the student exhibits during the course. Place a number in any box(es) of the DO and DON'T list for the number of times the student exhibited an inappropriate behavior during the course.

4. Save the gradebook.



Entering Skill and Knowledge Scores

The skill and knowledge portion of the gradebook is designed to track the student's lab, homework, and testing progress. The evaluations are completed on a batch basis, therefore, each assignment can be entered at the same time.

1. Open gradebook for the course to be edited.

2. Select the grade sheet for the course by clicking on the worksheet tab with the course's name.

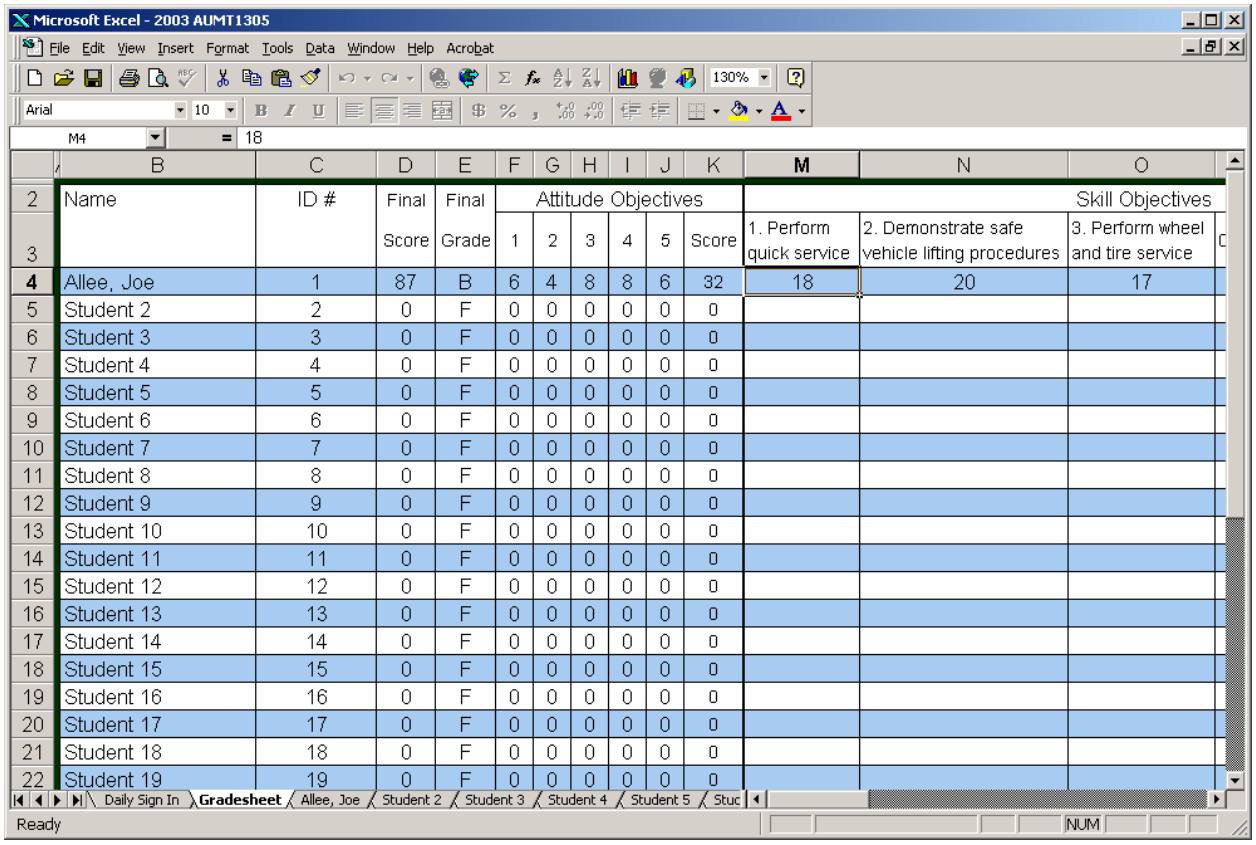
3. Navigate to the appropriate assignment column.

4. Type the first score for the corresponding student and assignment. Press ENTER.

5. Repeat for the remaining students.

6. Save the gradebook.

Note: The course **Grade Sheet** totals and student **Summary Evaluations** are updated automatically.



Gradesheet — Final Grade Report

Name	ID #	Final Score	Final Grade	Attitude Objectives						Skill Objectives								
				1	2	3	4	5	Score	1. Perform quick service	2. Demonstrate safe vehicle lifting procedures	3. Perform wheel and tire service	0	0	0	0	0	0
Allee, Joe	1	87	B	6	4	8	8	6	32	18	20	17						
Student 2	2	0	F	0	0	0	0	0	0									
Student 3	3	0	F	0	0	0	0	0	0									
Student 4	4	0	F	0	0	0	0	0	0									
Student 5	5	0	F	0	0	0	0	0	0									
Student 6	6	0	F	0	0	0	0	0	0									
Student 7	7	0	F	0	0	0	0	0	0									
Student 8	8	0	F	0	0	0	0	0	0									
Student 9	9	0	F	0	0	0	0	0	0									
Student 10	10	0	F	0	0	0	0	0	0									
Student 11	11	0	F	0	0	0	0	0	0									
Student 12	12	0	F	0	0	0	0	0	0									
Student 13	13	0	F	0	0	0	0	0	0									
Student 14	14	0	F	0	0	0	0	0	0									
Student 15	15	0	F	0	0	0	0	0	0									
Student 16	16	0	F	0	0	0	0	0	0									
Student 17	17	0	F	0	0	0	0	0	0									
Student 18	18	0	F	0	0	0	0	0	0									
Student 19	19	0	F	0	0	0	0	0	0									
Student 20	20	0	F	0	0	0	0	0	0									
Student 21	21	0	F	0	0	0	0	0	0									
Student 22	22	0	F	0	0	0	0	0	0									
Student 23	23	0	F	0	0	0	0	0	0									
Student 24	24	0	F	0	0	0	0	0	0									
TOTALS		100	A	8	8	8	8	8	40	20	20	20	0	0	0	0	0	0

Final Grade
90 to 100 Points = A
80 to 89 Points = B
70 to 79 Points = C
< 70 Points = F

2003 AUMT1305 1 of 3 5/13/2003

Printing a Student Report, Grade Sheet or a Daily Sign-In Sheet

Each student's **Summary Evaluation** worksheet includes a summary for all assignments completed by the student and can be used as an effective tool to communicate progress and course standing to the student at any time. See 'Printing a Student Report' later in this manual.

1. Open gradebook for the course.
2. Select the worksheet by clicking on the worksheet tab with the appropriate label.
3. From the File menu, select Print…
4. Check printer configuration in the print dialog box then press OK.

NOTE: For two sided reports select page 1 of 1 in the print dialog box then press OK. When page 1 has completed printing, place the report back into the input tray of the printer orienting the page to print side 2. From the File menu, select Print…. Select page 2 of 2, then press OK.

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