

**Natural Science 10-806-167**  
**The Science of Technology**  
**Generic (on-line) Course Syllabus**

**Course Summary**

This course is a new way to learn science by exploring items and devices all around you. An alternate title for this class could be "How Things Work" because it focuses on many of the things we commonly use each and every day, but tend to take for granted.

**Instructor:**

**Contact information:**

**E-Mail:**

**Phone:.**

**Prerequisites:** None

**Credits:** 3

**Text:** The required textbook for this course is **The Science of Technology - a conceptual approach to understanding technology** by Jim Mihal.

This book is an electronic eBook. There are two reasons for presenting the course material with this paperless approach - to minimize the impact on the environment and to take advantage of technology not available from a traditional textbook (view animations / applets, hyperlink to supplementary sources, etc). This eBook is accessed through Blackboard via a password validation code. This code is different from the log-in ID and password you just used to get to the Blackboard server. There are two ways you can acquire this code:

You can visit the McGraw-Hill ecommerce web site at [http://www.mhprofessional.com/mhhe\\_product.php?cat=108&isbn=0077333578](http://www.mhprofessional.com/mhhe_product.php?cat=108&isbn=0077333578). The ISBN number is 0077333578. The cost is \$55 (plus \$3.08 tax) - non-refundable! This site accepts MasterCard, Visa, American Express, or Discover Card.

OR

You can go to any MATC bookstore to pick up a printed access card. The ISBN number is 0078114144. The cost is \$76.50 (plus tax) - non-refundable after the seal is broken. Please use this option if you are an agency student (where a third party pays for your textbooks).

Either code takes you to the same material. The code grants access to the eBook for the entire semester. When you click on the **eBook** icon in Blackboard, you will be prompted to enter this code. You only have to enter this code once. After that, it is automatically

linked to your MATC ID and grants you full access to the course text material. You will have the option to print any of the material at your discretion.

**It is very important for you to understand that once you acquire this code, it is non-refundable!** The access card sold at the bookstore comes with a seal. Once the seal is broken, it is treated like any other digital media, meaning it can not be returned under any circumstances.

**Format:** eBook reading, discussion board, homework assignments and evaluations. All class related materials are offered through Blackboard.

**Important:** Please read the "Welcome Message" for class procedures. This message can be found in the announcements page in Blackboard. There you will find a short survey (worth 10 points) which requests information I need to get you set up in this class. This message also gives details about tests, assignments, discussion topics and information on due dates. There are some things you will need to do immediately. They are:

- Log into blackboard and access this class
- Access your MATC email account
- Send me answers to an initial survey (details are given in the "welcome message" ... worth 10 bonus points)
- Introduce yourself in the discussion board (and also worth 10 bonus points)

Any student who has not done any work in the class by the 16th day that the semester starts (when general classes start) will be dropped from the course.

**Course Topics** - I hope you enjoy this course. You will not be required to do any complex mathematics in this course. However, we will present many ideas and concepts in this class and this is the material I will stress on the evaluations. The course can be broken down into these seven units:

**Unit 1** is a conventional overview of the basic principles of physics - forces, work, energy, power, torque, etc. It also provides an outline of simple tools and machines as well as a short history of technology including great inventors and their inventions.

**Unit 2** demonstrates that the physical properties of materials may be exploited to accomplish a specific goal. For example, the expansion of a liquid may be used to measure the temperature (mercury thermometer). The world of sensors and actuators is explored in this context. Many common objects we use have feedback mechanisms built in which keep the device working properly, warn (and possibly correct) if it is exceeding its design limits, or shut the device off if it becomes dangerous. This unit explores many of these non-electrical applications.

**Unit 3** deals with electricity including what it is, ways it is generated, how it's used and converted to/from other forms. Like it or not, most of our technology uses some aspect of

electricity to make it work. In addition, the connection between electricity and magnetism is explored in devices such as solenoids, electric motors, CRT and televisions, Hall sensors, etc.

**Unit 4** is a continuation of unit 3 and explores photovoltaic cells, transistors, capacitors, and piezoelectric crystals.

**Unit 5** branches out to individual items we commonly use and focuses in on the science behind them. Items such as engines, airplanes, refrigerators, etc. are explored. The nature of fiber optics and common optical devices (telescopes, projectors, etc) are also included in this unit.

**Unit 6** examines how waves become useful tools as probes including MRI imaging and ultrasound. Waves also interact with matter in interesting ways to give us all kinds of devices including microphones, speakers, microwave ovens, etc. A basic understanding of wireless communication is also explored.

**Unit 7** is dedicated to one tool - computers. We explore individual parts and peripherals, the nature of digital information, how digital information is stored, manipulated and used. Aspects of the internet are also included in this unit.

## Method of Evaluation

### **Discussion Board - 150 points required (50 bonus points are available as extra credit)**

Please look over the discussion board in Blackboard. You will be required to post 15 answers @ 10 points each. In addition, you may complete an additional 5 posts @ 10 each for 50 bonus points for extra credit. The maximum number of points I will accept from the discussion board is, therefore, 200 points. Keep track of the points you earn in the discussion board.

As soon as a test becomes available, all discussion topics pertaining to that unit are closed. After the due date, I will post all the correct answers and that material may appear on the unit test. Please pay close attention to the due dates because once I post the answers, I can not accept any late discussion. The day after one units closes, I will make the discussion topics for next unit available for your posts.

Beware: Some of these questions have only one answer, so they become first come - first serve. That is, once answered (correctly), they are no longer available. Also, you can not post more than one answer in any one topic. Don't worry! ... There are plenty of topics and questions per topic to go around. However, always remember there are due dates for posting your answers. See the discussion board for details.

### **Assignments - 200 points**

Look in the assignments icon of Blackboard to find 2 mandatory 100 point assignments. You can also find a 50 bonus point extra credit assignment in the same place.

### 6 Unit Tests - 600 points

There will be 7 tests worth 100 points each (one for each unit). All tests will be offered online through blackboard (including the final exam). **I will drop the lowest score of the 7 unit tests.** If you miss the due date for any test, don't worry - I will reopen all tests during the same dates the final exam is available. To help you prepare for tests, I will offer a practice quiz for each unit (for no points). Please look in the Course Documents folder in Blackboard to see when tests are available.

### Final Exam - 200 points

In addition, there will be a 200 point comprehensive final exam. Students missing the final exam will receive a zero.

Activity	Total Possible Points (maximum)	Location
Discussion Board	150 required - plus 50 extra credit bonus	Discussion Board
Assignments	200 - plus 50 extra credit bonus	Assignments
6 Unit Tests (lowest of 7 is dropped)	600	Course Documents
Final Exam	200	Course Documents

There are 1150 possible points to be earned in this class (with a possibility of many extra credit bonus points). Your grade is based on a percentage of this total.

<u>Percent</u>	<u>Points</u>	<u>Grade</u>
92.5 -100%	1064 - 1150	A
90 - 92.5%	1035 - 1063	A-
87.5 - 90%	1006 - 1034	B+
82.5 - 87.5%	949 - 1005	B
80 - 82.5%	920 - 948	B-
78.5 - 80%	903 - 919	C+
72.5 - 78.5%	834 - 902	C
70 - 72.5%	805 - 833	C-
67.5 - 70%	776 - 804	D+
62.5 - 67.5%	719 - 775	D
60 - 62.5%	690 - 718	D-
0 - 60%	0 - 689	U

I hope you enjoy this class...Good Luck!

## Syllabus Addendum

### ADA Statement

If you have a disability that impacts your classroom performance and wish to request an accommodation, contact the Center for Special Needs at (414) 297-6838. They will require documentation regarding your disability to enable them to comply with your request. Admission of a disability is voluntary and will be handled in a confidential manner. MATC does not discriminate against individuals with disabilities and fully complies with the Americans with Disabilities Act.

### Student Absences

It is the responsibility of each student to discuss his/her absences with his/her instructor. When an absence occurs, the responsibility for the makeup of the work lies with the student.

### Dropping the Class

This class may be dropped two weeks prior to the final test. Please obtain a drop slip and have your instructor sign it if you intend to drop the course. **It is the student's responsibility to remove themselves from the class roster.** Incomplete grades will only be given if an emergency prevents completion of the course and advance arrangements are made with the instructor.

### Student Refund

Students who drop themselves from the class may receive a refund based on a sliding schedule. Contact information may be found on the MATC homepage, click on "Other Visitors", on this page under "Administration" click on "General Counsel" to view all MATC procedures and policies.

### Instructor Initiated Withdrawal

The instructor may drop a student if they fail to meet course requirements and expectations as specified in the course syllabus. Students in an "in-class" environment who have not attended by the 16th day of the semester will be dropped. Students who have not participated in an online class will be dropped on the 16th day of the semester. The semester starts when general classes resume and not necessarily when any particular class starts. Students are not eligible for a refund if dropped by the instructor.

### Student Complaint Procedure: Student Complaint Process

If you have college-related concerns or problems, either academic or nonacademic in nature, or have complaints or disputes involving college policies, services, employees, or other students, you are encouraged to utilize the services of the Office of Student Life. This office provides assistance and guidance in resolving issues that are pertinent to you. For assistance, call:

- Milwaukee Campus - 414-297-6229

- North Campus - 262-238-2218
- South Campus - 414-571-4715
- West Campus - 414-456-5304

### **Student Code of Conduct**

MATC may impose disciplinary sanctions for violations of the Student Code of Conduct. Violations may include, but are not limited to, the following situations, as may be required, consistent with MATC's mission:

- Conduct that damages or destroys college property, or attempts to damage or destroy college property
- Failure to comply with federal, state, county, and municipal laws or ordinances while participating in MATC activities or while present on MATC property
- Conduct that obstructs or impairs, or attempts to obstruct or impair, MATC's authorized activities, whether inside or outside a classroom, office, lecture hall, library, laboratory, auditorium, student center, or other place where an MATC-authorized activity is being held
- Conduct that endangers the safety or welfare of students, instructors, administrators, staff, or visitors
- Unauthorized possession of college property or property of another member of the college community
- Making a false statement, either verbally or in writing, to any MATC employee or agent on an MATC-related matter
- Conduct that engages in racial, religious, national origin, age, sexual, or handicap harassment
- Acts of academic dishonesty

Students judged to have violated the Student Code of Conduct are subject to disciplinary action, including suspension, probation, or possible termination in accordance with prescribed due process procedures described in the Student Code of Conduct booklet provided by the Office of Student Life at any campus. The Student Code of Conduct is the definitive document on student conduct and the judicial system. For more information, call 414-297-7859.

### **Academic Dishonesty**

Academic dishonesty includes, but is not limited to, cheating, collaborating with another without the approval of the instructor, plagiarizing, stealing the work of another, falsifying records of work, and assisting another student in any of the above. Academic dishonesty is a violation of the Student Code of Conduct.

If an instructor believes that an act of academic dishonesty may have occurred, he or she should meet with the student to discuss the alleged conduct (if possible). If the instructor determines that an act of academic dishonesty did occur, the instructor may choose one of the following responses:

- warn the student of unacceptable behavior,
- reprimand the student, and issue an alternative assignment/test,
- reduce the grade for the project or examination,
- remove the student from the course and submit a Withdrawal (W), or
- assign a failing grade for the course.

The instructor should notify the student in writing of the chosen response and convey a copy to the director of Student Life. An academic response may be taken by the instructor, the academic dean, the director of Student Life, the Disciplinary Appeals Committee, and/or any other appropriate official of MATC.

You, as a student, may appeal the decision of academic dishonesty to the Disciplinary Appeals Committee. This appeal must be submitted in writing to the chairperson (director of Student Life) of the Disciplinary Appeals Committee within ten (10) days of the service of the decision notice. Refer to the Student Code of Conduct booklet, available from the Office of Student Life (located at each campus), for further details concerning violations of the Student Code of Conduct and the appellate process. The Student Code of Conduct is the definitive document on student conduct (including academic dishonesty) and the judicial system at any campus. For more information, call 414-297-7859.