

**DEPARTMENT OF INDUSTRY AND TECHNOLOGY
BALL STATE UNIVERSITY
Muncie, Indiana
ITDPT 203 Material Processing
Course Syllabus**

Professor: Dr. Ray Shackelford

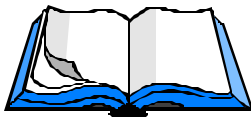
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- I. **Course Title:** ITDPT 203 - Material Processing
- II. **Prerequisites:** ITEDU 102 & 108 or permission
- III. **Catalog Description:**



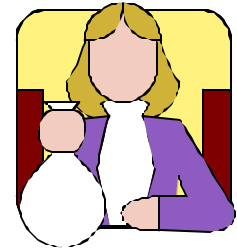
Industrial materials and processes are studied including material identification, classification, procurement, processing, use, and disposal. This course includes outside of class laboratory activities. (3 semester hours).

- IV. **Texts and/or Resources:**

Wright, Processes of Manufacturing, Goodheart-Willcox.

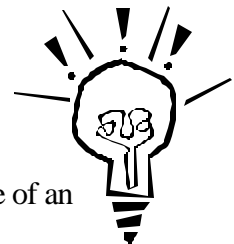
- V. **Laboratory Experiences and Hours:**

A schedule of open laboratory hours will be posted during the second week of the semester. Open laboratory time, (approximately 1 - 2 hours per week) will be in addition to the regularly scheduled class period. Scheduled class time will be reserved for discussion, demonstrations, in-class activities, and student presentations. The student will also spend approximately 2-4 hours a week outside of class studying or preparing course materials.



- VI. **Course Rationale:**

The number of materials and processes increases with every working day. In an effort to provide understanding and structure in this area, professional consensus has grouped industrial materials into the categories of metallic, polymeric, ceramic, and composites; and manufacturing processes into classifications of casting, forming, molding, separating, conditioning, assembly, and finishing. An understanding of these materials and processes; their identification, classification, procurement, processing, use, and disposal; and their related concepts, systems, and environmental and cultural impacts are essential to the background knowledge of an industrialist or technology teacher.



The purpose of this course is to assist you in the development these understandings and related conceptual frameworks, and foster the development of problem-solving and critical thinking skills that can be used to support future learning.

VII. Course Objectives:

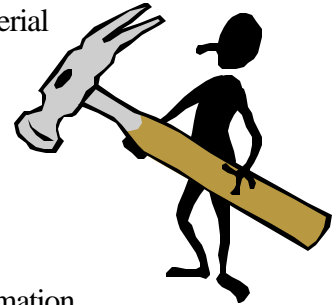
Upon satisfactorily completing Material Processing ITDPT 203, the student will be able to:

1. Describe techniques used to grow, harvest or extract raw materials.
2. Describe primary and secondary processes used to produce industrial materials or products.
3. Contrast the characteristics of materials and processes.
4. Select, convert, use, and dispose of industrial materials.
5. Classify, test, analyze, and describe the properties and structure of industrial materials.
6. Locate and communicate information about industrial materials and processes.
7. Demonstrate an understanding of concepts, principles, properties, and/or characteristics related to material processing or testing.

Major Activities

Activities are designed to support the development of materials and material processing concepts and principles. Potential activities include:

1. performing selected destructive and nondestructive material tests and analysis,
2. performing selected secondary material processes,
3. supporting the analysis of selected material tests,
4. using contemporary resources, and
5. writing technical reports to communicate understanding and/or information related to a selected process or test.

**VIII. Course Content:****I. Introduction**

- A. Definition of Materials and Processes
- B. Framework for Identifying, Classifying and Investigating Materials and Processes
- C. Methods used to Test or Evaluate Materials
- D. Environmental/Individual/Social impacts to be considered

II. Obtaining Materials

- A. Growing, Harvesting and Extracting Materials
 1. Fishing, farming, and forestry
 2. Mining and drilling
- B. Primary Processing
 1. Thermal
 2. Chemical
 3. Mechanical

III. Properties of Materials

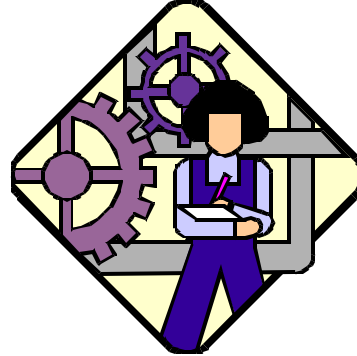
- A. Physical
- B. Chemical
- C. Physio-Chemical
- D. Mechanical
- E. Thermal
- F. Electrical
- G. Acoustical
- H. Optical
- I. Magnetic

IV. Nature of Materials

- A. Atomic Theory
- B. Bonding

- C. Crystal Structure
- D. Structure of Materials

- V. Material Classifications (engineering)
 - A. Natural Polymer
 - B. Synthetic Polymer Materials
 - C. Ceramic Materials
 - D. Metallic Materials
 - E. Composite
 - F. Other
- VI. Material Testing and Selection
 - A. Destructive and Non-destructive Testing
 - B. Criteria and Procedures for Identifying and Selecting Materials
- VII. Secondary Processes
 - A. Casting/Molding
 - B. Forming
 - C. Separation
 - D. Conditioning
 - E. Assembly
 - F. Finishing
- VIII. Impacts, Material Disposal, and Storing (eg. 4 r's, resource allocation, etc.)
 - A. Health
 - B. Society
 - C. Climate
 - D. Cycle of Materials
 - E. Procedures
- IX. Procedures and Safety Considerations for Selecting, Processing, Using, and Assessing Materials



IX. **Course Format:**

Typical strategies to be used to develop and reinforce course content include:

- Individual and Small Group Problem-Solving
- Discussion/Questioning
- Laboratory Demonstrations
- Individual and Small Group Laboratory Activities
- Individual and Group Interaction, Evaluation and Feedback

X. **Methods of Student Evaluation:**

Proposed Activities / Grading System/Scale

Grades will be assigned on the basis of total points earned during the semester. The following is a list of proposed course activities and their **approximate** point values:

Laboratory Reports / Activities Analysis Sheets (9-11)	100-140 points
Final Exam	80 points
Quizzes (4 – 6 announced and unannounced)	80-100 points
Individual Test /Process	50 points
Laboratory Activities	20 points

NOTE: Other activities and/or point values may be identified during the first day of class or 1 week before an assigned due date.

The Grading Scale will be as follows:

100 - 92.5 %	of total possible points	= A
92.4 - 90 %	of total possible points	= A-
89.9 - 87.5 %	of total possible points	= B+
87.4 - 82.5 %	of total possible points	= B
82.4 - 80 %	of total possible points	= B-
79.9 - 77.5 %	of total possible points	= C+
77.4 - 72.5 %	of total possible points	= C
72.4 - 70 %	of total possible points	= C-
69.9 - 67.5 %	of total possible points	= D+
67.4 - 62.5 %	of total possible points	= D
62.4 - 60 %	of total possible points	= D-
below 59.9 %	of total possible points	= F



Exception to the above policy will occur under the following conditions:

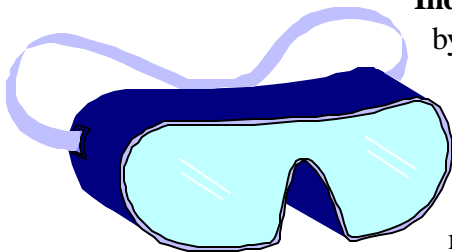
1. Failure to comply with the **Class Attendance/Assignment/Test Policies**.
2. **Abuse** of equipment, laboratory facilities, and/or materials.
3. Failure to perform activities **as assigned**.
4. Other - because of potential safety problems that can develop due to poor attendance and the missing of equipment and laboratory demonstrations, **any student missing 3 or more days of class may be asked to withdraw**.

XI. **Methods of Course Evaluation:**

The Departmental Course/Instructor Evaluation System will be used to assess this course. Feedback from the assessment will be used to improve the teaching effectiveness of the instructor and course content.

XII. **Laboratory Usage:**

Students are expected to maintain an attitude of safety in all activities related to the course. Each individual is expected to leave the laboratory and equipment in good order after usage. The student will be held responsible for the tools and equipment he or she uses. It is the student's responsibility to clean the area or areas in which they have worked, return tools used and report damaged equipment.



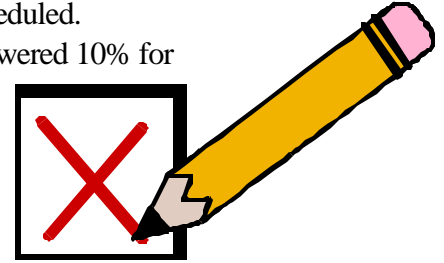
Industrial safety glasses with side shields will be worn at all times by all students during demonstrations and laboratory activities at all times. No exceptions! Students should see the laboratory supervisor before pursuing activities requiring special procedures or safety equipment. Loose clothing and long hair are not suitable when working around moving machinery. Long hair must be restrained. Rags are to be kept in the red containers provided for that purpose. Oil, grease, and loose material must be wiped from floors immediately.

No student is to use any equipment until he/she has been given adequate instruction and approval for its use.

Any student who modifies/changes any computer files/programs may lose the privilege of their use for the remainder of the semester.

XIII. Attendance/Assignment/Test Policy:

- A. All students are to comply with the "Class Attendance Policy" as described in the Ball State University Undergraduate Catalog. **Students with excessive (three or more) absences or tardies can expect to have their final grade lowered by at least one letter grade.**
- B. Students are responsible for **making up all work missed** by being absent from class. The instructor would appreciate **a phone call notifying** him/her of a planned absence due to illness or personal emergency.
- C. All assignments and tests are to be submitted or taken as scheduled.
- D. A student's grade for a given activity or assignment will be lowered 10% for each day it is late. (**Note:** An assignment is considered to be one day late even though it is turned-in after class on the day it is due.)
- E. ***No activity or assignment will be accepted for evaluation once that activity or assignment has been returned to the class.***
- F. All work submitted for this class must be original work. Material that has been submitted for another class **can not** be used in this class.
- G. Before assessing any activity or assignment its **professional appearance** will be assessed. Any work not passing the professional appearance assessment will be returned to the student ungraded. Professional materials have the following characteristics:
- They are accurate.
 - When appropriate, they include computer generated materials with a backup disk.
 - In some cases, information may need to be illustrated graphically.
 - They are grammatically correct including sentence structure and spelling.
 - Materials are neat, organized and consistent in format and style (e.g., APA).
 - They effectively use color and/or graphics, headings, margins, spacing and text to highlight information and enhance communication.
 - The assignment represents acceptable quality work and demonstrates proper techniques/practices.
- H. All course activities are subject to the University's Academic Dishonesty / Plagiarism Policies.



Academic Dishonesty/Plagiarism

Academic dishonesty and plagiarism are unacceptable behaviors in an institution of learning or life. In the Faculty and Professional Handbook, Ball State University describes the University's student academic ethics policy. All course activities are subject to this policy.

In addition to these guidelines, students are subject to the following course guidelines:

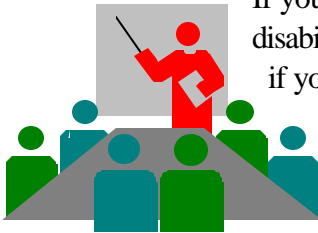
1. Information and/or material used from a source other than the student must be properly cited. Information and/or material not properly referenced and footnoted will be grounds for the instructor to issue a grade of **"F"** for that **particular assignment**.

2. Any student who commits an act of academic dishonesty may receive an **"F"** in the course.
3. Any student who plagiarizes or violates procedures prescribed to protect the integrity of an assignment (i.e., uses material from another person or resource and claims that material as their work) will receive an **"F" in the course.**
4. Any student who violates procedures which protect the integrity of a quiz, examination, or similar evaluation will receive an **"F" in the course.**
5. Students have a responsibility to insure that other students do not copy or use their work.
6. Students who have any questions as to what constitutes an act of plagiarism or academic dishonesty should discuss it with the instructor before completing the assignment in question and review the University's policy on "Student Academic Ethics".

XV. Audit Policy:

Because of **SAFETY** considerations, all individuals auditing ITDPT 203 must complete all assigned activities with a satisfactory grade of "C" to continue to progress and participate in the class.

XVI. Special Needs Learners :



If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. My office location and phone number is AT 133A and 765-285-5653 respectively.