

DEPARTMENT OF INDUSTRY AND TECHNOLOGY
BALL STATE UNIVERSITY
Muncie, Indiana

ITEDU 108 Production Techniques
Course Syllabus

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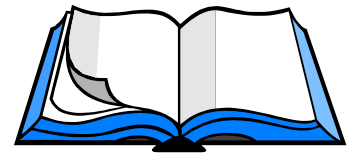
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Course Description

1. *Course:* ITEDU 108
2. *Course Title:* ITEDU 108 Production Techniques (3 semester hours)
3. *Prerequisites:* None
4. *Catalog Description:*

Tools, machines and processes used in the technology education classroom and laboratory are studied. Laboratory experiences help students develop techniques related to material and information processing. This course includes outside of class laboratory activities (4 semester hours).



5. *Faculty Qualified to Teach the Course:*
 Category 1 Teacher Education Faculty
 Category 2 Teacher Education Faculty
 Other Faculty Requirements

Clinical Experiences

6. *Clinical Experiences and Clinical Hours:*
 Observation
 Tutoring
 Small Group Instruction
 Whole Class Instruction
 Civic Engagement
 Rural
 Suburban
 Urban
 Academy
 Burris

Educational Standards: INTASC (Development & Content), Technological (ISTE), ITEA / CTTE / NCATE Standards

7. *Conceptual Framework: INTASC Principles Primarily Emphasized:*

- Principle 1 (Understanding Content)
- Principle 2 (Understanding Development)
- Principle 3 (Understanding Differences)
- Principle 4 (Designing Instructional Strategies)
- Principle 5 (Managing and Motivating)
- Principle 6 (Communicating)
- Principle 7 (Planning and Integrating)
- Principle 8 (Evaluating)
- Principle 9 (Reflecting on Practice)
- Principle 10 (Participating in the Professional Community)

8. *Developmental Levels Covered:*

- Early Childhood
- Middle Childhood
- Early Adolescence
- Adolescence and Young Adult

9. *ITEA / CTTE / NCATE Standards Covered:*

- Philosophy of Technology Education, Curriculum Development, and Instruction
- Depth and Breadth in Math, Science, & Related Fields
- Teaching and Technical Skills
- Use Technological Concepts
- Develop and Manage a T.E. Program
- Develop Attitudes, Knowledge, and Skills

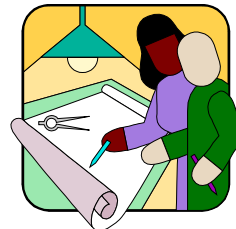
10. *Technology / ISTE Standards Covered:*

- General Preparation
- Professional Preparation
- Student Teaching / Internship Preparation

Course Rationale, Objectives, Content, and Use

11. *Course Rationale:*

During the study of technology a variety of tools, machines and techniques are used to process materials and information. Materials are often categorized into the following four



sub-groups: (1) ceramics, (2) polymers, (3) metallics, and (4) composites. Therefore, a study of the tools, machines and processes used to change the form or composition of polymers, ceramics, metallics, and composites should be a significant part of the study of technology.

The generation and manipulation of information is becoming more and more important in today's society. Common processes include information generation, storage, reproduction, and encoding and decoding. Therefore, a study of the tools, machines and processes used to generate, store, reproduce, and/or encode and decode should also be part of the study of technology.

It is important that technology education students develop the ability to use common tools, machines and techniques to process materials and information. This ability will support the development of selected production techniques that may be required to study and teach technology.

12. *Course Objectives:*

Upon satisfactorily completing Production Techniques ITEDU 108, the student will be able to:

1. Demonstrate the ability to select and safely use tools, machines, and/or processes to convert materials.
2. Demonstrate the ability to select and safely use information/electronic devices to produce/reproduce, convert, store, transmit and/or retrieve information to support effective communication.
3. Select, process, use, and dispose of common materials.
4. Demonstrate the ability to teach oneself how to use new materials, processes, and/or tools and equipment.



13. *Course Content:*

I. MATERIAL PROCESSING TECHNIQUES

A. LAYOUT

1. Measurement (linear and angular)
 - a. to the nearest 1/16
 - b. to the nearest .001
 - c. to the nearest degree
2. Squaring
3. Transferring
4. Dividing
5. Marking

B. SEPARATION EQUIPMENT/ PROCESSES

1. Band Saw (metal/ wood)
 - a. ripping
 - b. crosscutting
 - c. cutting curves
 - d. machine setups and adjustments
2. Tables Saw
 - a. ripping
 - b. crosscutting
 - c. grooves and dados
 - d. angles
 - e. machine setups and adjustments
3. Drill Press (metal/ wood)
 - a. drilling
 - b. counter sinking
 - c. machine setups and adjustments
4. Jointer
 - a. jointing edge
 - b. jointing surface
 - c. machine setups and adjustments
5. Surfacer
 - a. planing surfaces
 - b. machine setups and adjustments
6. Using Abrasives
 - a. selecting
 - b. hand abrading
7. Radial Arm Saw
 - a. crosscutting
 - b. cutting angles
 - c. machine setups and adjustments
8. Disk/ Belt Sander
 - a. abrading edges
 - b. abrading surfaces
 - c. machine setups and adjustments
9. Using Portable Power Tools
 - a. Drill
 - b. Sander (random orbital/ vibrating/ belt)
 - c. Router
 - d. Biscuit Jointer
 - e. Bayonet (saber) Saw
 - f. Reciprocating Saw
10. Table Jig or Scroll Saw
 - a. ripping/ crosscutting
 - b. cutting external and internal curves
 - c. machine setups and adjustments
11. Grinders
 - a. grinding/ abrading
 - b. grinding faces and shapes

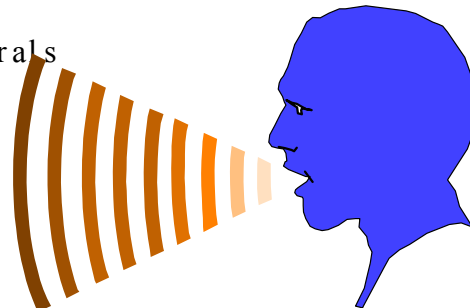


- c. machine setups and adjustments
- 12. Shear
 - a. squaring
 - b. cutting to length
 - c. cutting angles
- 13. Engine Lathe
 - a. facing
 - b. turning
 - c. drilling
 - d. tool grinding
 - e. speeds & feeds
 - f. machine setups and adjustments
 - g. safety
- 14. Vertical Mill
 - a. facing
 - b. drilling
 - c. notching
 - d. speeds & feeds
 - e. machine setups
 - f. safety
- C. FORMING EQUIPMENT/ PROCESSES
 - 1. Thermo Former
 - a. forming
 - b. machine setups and adjustments
 - 2. Strip Heater
 - a. forming
 - b. machine setups and adjustments
 - 3. Bar Folder
 - a. folding and bending edges
 - b. machine setups and adjustments
- D. ASSEMBLY EQUIPMENT/ PROCESSES
 - 1. Gas Welding
 - a. brazing
 - b. welding
 - c. setups and adjustments
 - 2. Spot Welder
 - a. spot welding surfaces
 - b. setups and adjustments
 - 3. Adhesives
 - a. adhesion and cohesion
 - b. using thermoplastics and thermosets
 - c. using bar, C-, and parallel jaw clamps
 - d. gluing
 - 4. Fasteners
 - a. nailing
 - b. screwing
 - c. plate joinery
 - d. stapling

- E. FINISHING EQUIPMENT/ PROCESSES
 - 1. Brushing
 - 2. Rubbing/ Wiping
 - 3. Spraying
- F. MSC. HAND TOOLS
 - 1. Saws
 - 2. Files
 - 3. Clamps
 - 4. Taps and dies
 - 5. Screwdrivers
 - 6. Pliers/ Wrenches
 - 7. Measuring equipment
 - 8. Marking tools
 - 9. Hammers
- G Safety of Materials, Processes and Material Handling
 - 1. Tool and machine safety
 - 2. Chemicals
 - 3. Sanitary
 - 4. MSDS

II. INFORMATION PROCESSING TECHNIQUES

- A GENERATION TECHNIQUES (computer)
 - 1. Word processing
 - 2. Graphics processing
 - 3. Using spreadsheets
 - 4. Presentation software
 - 5. Video still
 - 6. Digital still
 - 7. Processing data
- B. STORING INFORMATION
 - 1. Copying computer disk / file
 - a. formats (pc/mac)
 - b. formatting
 - 2. Video tape
- C. REPRODUCING INFORMATION
 - 1. Using printers and peripherals
 - 2. Photocopying
 - 3. Poster printing
- D. ENCODING/ DECODING
 - 1. Scanning
 - a. images
 - b. text
 - c. image manipulation
 - d. formats (jpeg, tiff, pict, etc.)
 - 2. Video Camera
 - a. taping
 - b. setups and adjustments



- c. audio -- extend and remote
 - 3. Using a Calculator
 - 4. Video Still / Digital Still
 - a. imaging
 - b. setups and adjustments
 - c. down-loading
- III. Learning New Equipment
 - A. Using manuals
 - B. Machine inputs / processes / outputs
 - 1. Machine systems (support ant cover, guidance and control, and power transmission)
 - 2. Trouble shooting
- IV. Safety
 - A. Eye and ear protection
 - B. Ventilation and breathing apparatus
 - C. Protection of exposed surfaces (skin) to temperature changes, chemicals, electro magnetic waves, etc.
 - D. Tool, equipment, and material processing procedures and practices
 - E. Laboratory conduct, practices, and procedure

14. *Instructional Strategies:*

- A. Typical instructional strategies to be used to develop and reinforce course content include:
 - Lecture
 - Individual and Small Group Laboratory Activities
 - Discussion/ Questioning/ Demonstrating
 - Discovery
- B. Sequence:
See Course Calendar

15. *Schedule for the semester*
See Course Calendar

16. *Texts and resources:*

- Repp, McCarthy & Ludwig. (1994) Metalwork Technology and Practice, Columbus: Glencoe.
- Wagner, W & Kicklighter, C. (2006). Modern woodworking, Tinley Park, IL: Goodheart-Willcox.
- Selected WWW Sites

17. *References / Sources of Knowledge Upon Which This Course is Based:*

Selected references, media, and Internet materials are used to support student learning.

18. *Additional information:*

Various curriculum resources are available in the material processing laboratory but they are not to leave the room

Student Learning and Assessment

19. *Methods of Student Performance Assessment:*

- Classroom Performance (live, videotape)
- Lesson Artifacts
- Paper / Pencil Quizzes and Tests
- On Demand Tasks (classroom and laboratory assignments)
- Interviews (debriefing, questioning, etc.)
- Testimonials (by peers, supervisors, etc.)
- Products reflecting learning of candidate's students
- Electronic portfolio (to reflect professionalism and growth)

20. *Plan for Evaluating Student Achievement:*

Proposed Activities / Grading System/Scale

A **Major Activities/Tasks and Deadlines:**

Required activities/tasks and assigned deadlines will be explained during class orientation. An assignment sheet describing and identifying each activity and specific deadlines will also be distributed during the first day of the course.

B **Grading System/Scale**

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

Tentative Laboratory Activities and Point Values

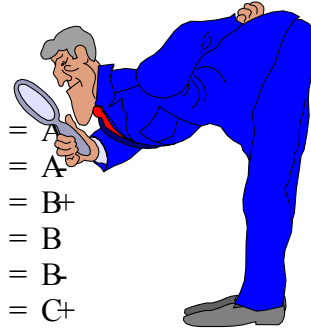
<u>Material Processing Products/Activities</u>	300 pts.
<u>Information Processing Products/Activities</u>	200 pts.
<u>Tests and Quizzes</u>	200 pts.
Md-term/ Final Exam/ Quizzes	
<u>Workbook/ Sheet Assignments</u>	50 pts.

Final grade for the course will be assigned by a percentage determined by dividing the number of points earned by the total number of points.

NOTE: Other activities and/or point values may be identified during the first day of class or 2 weeks 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.**

21. *Method of Course Evaluation:*

Students will have an opportunity to complete a university-approved course evaluation form late in the course. Comments and information from the forms will help in developing this course in the future.

22. *Laboratory Experiences and Hours:*



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. The student may also be asked to clean or straighten others' areas by the laboratory supervisor.

Students are expected to maintain an attitude of safety in all activities related to the course. **Industrial safety glasses or eye protection** with side shields must be worn at all times by all students during demonstrations and laboratory. **No exceptions!** Students should see the laboratory supervisor before pursuing activities requiring special procedures or safety equipment (i.e. welding, special saw cuts, molding processes, etc.). 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 computer, computer program, machine, tool or piece of equipment until he/she has been given adequate instruction and approval for its use.

Students are expected to maintain an attitude of safety in all activities related to the course. Students should see the instructor/laboratory assistant before pursuing activities requiring special procedures.

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.

23. *Special Student Needs:*



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 is on the first floor of the Applied Technology Building (Room AT 133A) and the phone is (765) 285-5653. The main office number is (765) 285-5642.

24. *Policies:*

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.
- F. 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".

Tentative ITEDU 108 Calendar

	Monday	Wednesday	Friday
1/9/06 1/11/06 6	Introduction	Common Principles Radial Arm Saw, Surfacer, and Jointer	Radial Arm Saw, Surfacer, Table Saw, Band Saw, and Jointer <i>MW read pages 203-218</i> Qui
1/16/06 1/18/06	Martin Luther King Day	Table Saw / Radial Arm / Jointer / Surfacer <i>MW read pages 219-54</i> Qui	Adhesives & Assembly / Digital Camera / Image <i>MW read pages</i>
1/23/06 1/25/06	Band Saw, Jig Saw, Plate Jointer	Sanders / Fasteners / Joints / Abrasives <i>MW read pages 139-64</i> Qui	Drill Press, Drills, & Joinery Finishing Block & Photo <i>MW read pages 85-94; 273-90</i>
1/30/06 2/1/06 2/3/06	Wood ID <i>MW read pages 21-44</i>	Power Hand Tools Sanders, Drills, Saber Saw <i>MW read pages 311-44</i> Qui	Bill of Materials Blades / Hand Tools <i>MW pages 7-20; 61-84; 113-22</i>
2/6/06 2/8/06 2/10/06	Integration Activity	Scanning & Trans. Development	Presenting Information & Using Peripherals
2/13/06 2/15/06	Conducting Internet Searches & Photoshop	Scanning and Manipulating Images (Photoshop) Bill of Materials	Using Digital & Video Cameras & Photoshop Cutting Board
2/20/06 2/22/06	Word Processing	Integrating Data	Presenting Information Internet Search Results / Scan / Trans
2/27/06 3/1/06	Using Spread sheets Photoshop Exercises	Mid-Term Exam	Separating, Forming, & Assembling Plastics
3/13/06 3/15/06	Measuring / Tools & Qui Metal Lathe <i>MT read pages 90-125</i>	Newsletter Metal Lathe <i>MT read pages 450-487</i>	Metal Lathe Qui
3/20/06 3/22/06	Milling Machine Qui <i>MT read pages 498-535</i>	ITEA Milling Machine	ITEA Milling Machine
3/27/06 3/29/06	Drill Press / Finishing Qui Tap, Die, & Band Saw <i>read pages 409-38 & 154-75</i>	Finishing Qui <i>MW read pages 165-200</i> Plastics Product	Finishing
4/3/06 4/5/06	Finishing	Assembly / Welding <i>MT read pages 209-49</i> Qui	Assembly / Gas, Electric, & Spot Welding
4/10/06 4/12/06	Assembly / Welding	Using Manuals & Forming Metallics	Injection Molding & Thermoforming Cutting Board; Finishing
4/17/06 4/19/06	Forming Polymers	Rotational & Compression Molding <i>MT read pages</i>	Integration Presentations Welding
4/24/06 4/26/06	Integration Presentations	Integration Presentations	Review for Final Exam

Tentative Final Date 5/1/06 -- 7:30 - 9:30