Industrial Arts

Course of Study

Board of Education

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STATEMENT OF APPROVAL

This course of study guide

was approved by the

Board of Education

Oakwood City School District

Dayton, Ohio

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Date

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BOARD OF EDUCATION
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PHILOSOPHY OF THE OAKWOOD SCHOOLS

The Board of Education believes that each pupil should be accepted into the educational program as he is and that he shall be provided with a stimulating environment and opportunities for learning experiences which will enable him to achieve to his individual capacity. The Board believes that education must develop the basic principles and fundamental ideals of Americn democracy within the minds of American youth so they will have the knowledge and the will to guard the freedom which it affords.

PHILOSOPHY OF OAKWOOD SENIOR HIGH SCHOOL

Oakwood Senior High School shall provide, through the cooperative efforts of the professional staff, the students, and the community, an education that serves the needs of its students in preparation for life in today's society. The program must not only impart knowledge and skills, but also stimulate inquiry and develop attitudes, interests, and values for the successful functioning of the individual. The staff will strive to make a positive contribution to the educational and personal development of Oakwood youth.

In view of this philosophy, Oakwood High School has the following objectives or purposes:

1. To cultivate in its students a desire for learning and an attitude of intellectual curiosity as well as creative thinking.

2. To plan and implement curriculum and instructional services in relation to the needs, talents, future plans, and interests of students so as to provide excellence in education.

3. To emphasize an educational program for the college-bound student and also to provide opportunities for a comprehensive educational program to the non-college-bound student.

4. To develop cooperative relationships among staff, administration, board of education, students, parents, and community and to develop effective means of communication.

5. To promote social development and good health, through carefully sponsored school events and co-curricular activities, recognizing the value and advantages to students and community of such programs in developing attitudes of self-worth, self-confidence, competition, fair play, good citizenship, and a desire to improve and excel.

6. To initiate, develop, and implement curricular innovations in order to meet more effectively the needs of students while considering the desires of the community in respect to these changes.

7. To provide the individual student with the opportunity to participate in the determination of particular school policies and programs.

8. To help identify changes occurring in a democratic society and to equip the student to understand and react to these changes in a rational manner.

9. To identify individual differences, abilities, and capabilities to enhance individual student development and course content.

10. To encourage student involvement in classroom instructional activities which involve critical examination and use of information, problem solving, exchange of ideas, and evaluation.

11. To provide a general education which includes the study of mathematics, scientific developments, languages and literatures, fine and practical arts, the social studies and history, and specifically the development of skills in studying, reading, writing, speaking, and listening.

12. To review regularly the school's performance in terms of fulfilling this philosophy and these objectives.

OAKWOOD JUNIOR HIGH SCHOOL

STATEMENT OF PURPOSE

The educational program of Oakwood Junior High School is designed and developed to provide for a common education in basic knowledge and skills; stimulate diversified interests; assist students in making intelligent decisions concerning their future; meet the various individual needs of the students; provide satisfactory developmental social experiences; and provide a gradual transition from preadolescent education to learning experiences suited to the needs and interests of adolescents.

OAKWOOD JUNIOR/SENIOR HIGH SCHOOL

INDUSTRIAL TECHNOLOGY

PROGRAM PHILOSOPHY

Industrial technology is an integral part of the educational program in the Oakwood Schools. The increasing complexity of our modern technological society and the increasing amount of mechanization encountered in almost every phase of daily living make industrial education experience essential for all youth.

In the junior high school, the industrial education program should guide the student through a series of exploratory experiences which will help to discover aptitude, abilities and interests, develop manipulative skills and provide opportunity for creative activities. The planning and the construction of a project should act as a vehicle for teaching the practical application of mathematics, science, economics, and other areas of instruction.

Industrial Education in the senior high should provide opportunities for both broad exploration of many areas and specialization on specific skills. This type of program provides broad experiences for the future technician or the undecided student, as well as pre-engineering courses for the student who is college-bound.

EVALUATION

Evaluation is an integral and continuous part of the instructional program and includes observation, informal assessment, and formal testing. Evaluation is a major tool in planning instruction: assessing, providing feedback, and determining program effectiveness.

Through effective evaluation procedures:

1. student strengths and weaknesses can be identified and assessed.
2. teachers can plan and provide appropriate instructional strategies and materials for students.
3. student growth and development can be determined.
4. parents can be informed of student needs.

Evaluative techniques which are used successfully by teachers in the Oakwood City Schools include:

1. publishers' tests.
2. standardized norm-based tests.
3. teacher-made tests - both written and oral.
4. criterion-referenced tests.
5. inventories.
6. pupil-teacher conferences.
7. teacher observation - both directed and informal.

Teachers use these and other methods which are found to be appropriate and effective in serving the purpose of improving instruction and student learning.

INDUSTRIAL ARTS 7TH GRADE

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVE Student will:
A. To provide the student with the opportunity to learn about industry in terms of its materials, processes and products.	1. Develop a knowledge of industry	a. Discuss the various products used in society today. b. Discuss the various occupations and careers created by products. c. Discuss the methods industry uses in transportation of good.
B. To provide for the development of skills with the tools, machines and processes of industry.	1. Understand the basic methods of fastening materials.	a. Demonstrate a knowledge of fasteners. b. Identify the basic fasteners. c. Determine the proper use of fasteners.
	2. Understand the various methods of measurement.	a. Describe the various measurement tools. b. Measure within 1/16" using a ruler. c. Choose the proper measuring tool for the job.
C. To develop within the student an attitude of respect for good health and proper safety practices.	1. Establish safe work habits for the shop and home and will develop the ability to work safely with others.	a. Discuss safety in general. b. Discuss the fire drill and tornado drill procedures. c. Know the importance of safety in the lab. d. Properly use safety with hand tools. e. Properly use safety with power tools. f. Properly use safety when handling materials common to the shop. g. Understand the proper methods of safety when using finishing materials. h. Protect himself by using proper safety rules.

INDUSTRIAL ARTS GRADE 7

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVES Student will:
D. To provide for the development of skills and techniques in problem solving and creativity.	1. Develop creativity.	a. Place their thoughts and ideas on paper. b. Learn the process of brainstorming. c. Understand the qualities of good design.
	2. Develop an understanding and ability to problem solve.	a. Solve problems with logical thought. b. Work out problems encountered while working on projects. c. Design and develop small products.

INDUSTRIAL ARTS 8TH GRADE

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVE Student will:
A. To develop an attitude of respect for good health and proper safety practices.	1. Apply safe procedures in in the use of drafting tools and equipment.	a. Identify and demonstrate safe use of drafting instruments. b. Recognize and practice safe working habits.
B. To become informed of the avocational and career opportunities that are available in our technologically oriented society.	1. Gain knowledge about careers in areas involving activities utilizing drafting procedures.	a. Become familiar with related careers and demonstrate how these careers relate to industry. b. Discuss selected careers in a written report. c. Understand career terms such as: engineer, designer, draftsman, etc.
C. To develop skills with the tools, machines and processes of industry.	1. Apply the proper use, care and knowledge of the use of drafting instruments to produce appropriate drawings.	a. Use T-squares and triangles in drawing lines. b. Develop competency in using proper scales. c. Sketch circles, arcs, and straight lines. d. List vocabulary of drafting terms and symbols.
	2. Participate in sketching and lettering.	a. Master lettering single stroke vertical capital letter and number. b. Make simple one, two, and multiple view sketches of box shaped objects. c. Draw oblique, pictorial and isometric sketches using grid paper. d. Dimension a sketch.
	3. Learn and apply the proper procedures for drawing separate views of an object.	a. Complete a multi-view drawing. b. Identify and draw the appropriate lines (center, hidden, visible edge, and projection) that are used in a drawing. c. Understand the relationships of views and the angles of projection in multiview drawing.

INDUSTRIAL ARTS 8TH GRADE

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVE Student will:
C. (Cont'd)	4. Demonstrate an understanding of surface development.	a. Construct a rectangular development from a given pattern. b. Construct a development from a pictorial view. c. Develop a stretch-out using learned procedures.
	5. Understand how the craft of making identical words and pictures evolved through the years.	a. Describe the first printing processes. b. Understand printing terms and apply them to daily lab use.
D. To develop skills and techniques in problem-solving and creativity.	1. Experience simple drawing procedures using a CAD (computer assisted drawing) system.	a. Construct images on a computer screen using CAD program.
E. To learn about industry in terms of its materials, processes and products.	1. Demonstrate working knowledge and understanding of relief printing.	a. Become familiar with typesetting techniques and basic printing terminology. b. Set type and operate a press to produce multiple copies.
	2. Gain knowledge of automated offset printing equipment and processes.	a. Become familiar with the offset rotary press and basic principles of offset. b. Participate in making a hand proof of an offset plate.
	3. Participate in silk screen printing process.	a. Design, cut in film, adher, and print a silk screen image.
	4. Compose images electronically.	a. Design and print a letterhead, utilizing preprogrammed images of a computer software package.

INDUSTRIAL ARTS I

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVES Student will:
A. To provide the student with the opportunnity to learn about industry in terms of its materials, processes and products and occupations.	1. Student will work with various materials of industry.	a. Learn about materials. b. Work with the materials of industry. c. Fabricate material. d. Experiment with materials.
	2. Learn about the various ways materials are processed.	a. Discuss the various methods of manufacturing. b. Discuss the methods of material processing. c. Process the materials of industry.
	3. Learn about the various products produced in our industrialized society.	a. Discuss the reasons various materials are used. b. Discuss the advantages of certain materials.
	4. Learn about the the materials used in industry.	a. Discuss various products made today. b. Understand material application. c. Fabricate various products. d. Experiment with materials. e. Learn about material processing.
	5. Discuss the various occupations and careers in todays industrial society.	a. Discuss various jobs available today. b. Discribe varying degrees of education required for occupation. c. See how occupations change in industry.
B. To provide for the development of skills with the tools, machines and processes of industry.	1. Develope a working knowledge of hand tools.	a. Identify various hand tools. b. Understand proper use of hand tools. c. Properly care for hand tools.

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVES Student will:
B. (Cont'd)	2. Develop a working knowledge of electric hand tools.	a. Identify basic electric hand tools. b. Understand proper applications of electric hand tools. c. Properly operate and care for electric hand tools.
C. Provide for the development of skills and techniques in problem solving and creativity.	1. Will develop a plan of procedure.	a. Organize his thoughts into a logical sequence. b. Develop a plan of procedure. c. Interpret the value of a plan of procedure.
	2. Develop and design project plans.	a. Specify and determine the cost of a project. b. Incorporate the elements of design. c. Identify materials needed to manufacture products.
D. To enable the student to recognize craftsmanship and good product design in the products of individuals and industry.	1. Develop better values as a consumer.	a. Identify various materials that products are made of. b. Examine products for quality. c. Develop an understanding of good workmanship. d. Apply principles of beauty and good taste in connection with all articles made.
E. To develop within the student a positive attitude toward work including the ability to work for himself and with others.	1. Learn about work ethics.	a. Learn such work habits as being on time. b. Use time wisely. c. Do a good days work. d. Demonstrate good work habits. e. Learn to work with management.
	2. Work alone, with others.	a. Work together on projects. b. Learn to share ideas. c. Respect others when working.

INDUSTRIAL ARTS I

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVE Student will:
F. To inform the student of the avocational and career opportunities that are available in our technologically oriented society.	1. Gain a better understanding of the various occupations in our society.	a. Develop a broader view of occupations. b. See how product demand change the occupational work force. c. Identify various occupations.
	2. Develop occupational awareness through working with materials and processes.	1. Develop understanding of basic occupations through working with materials.
G. To develop within the student an attitude of respect for good health and proper safety practices.	1. Learn proper safety procedures in the shop.	a. Learn of the various protective equipment available to him in the shop. b. Operate safely basic hand tools. c. Operate safely basic hand electric tools. d. Operate safely basic stationary power tools. e. React properly to a fire or tornado while in school.

ADVANCED INDUSTRIAL ARTS

PROGRAM GOAL	PROGRAM OBJECTIVE	SUBJECT OBJECTIVE Student will:
A. To provide the student with the opportunity to learn about industry in terms of its materials, processes and products.	1. To provide the student with knowledge of the materials of industry.	a. Work with materials. b. Discuss and investigate various materials. c. Fabricate materials. d. Experiment with materials.
	2. To acquaint the student with the method of processing material.	a. Identify methods of material processing. b. Choose proper methods of material processing. c. Discuss advantages and disadvantages of various processes.
	3. To provide a knowledge about the various products produced in our industrialized society.	a. Identify many of the products produced in the U.S.A. b. Identify many of the by-products produced in the U.S.A. c. Develop a knowledge of advantages and disadvantages of various products.
B. To provide for the development of skills with the tools, machines and processes of industry.	1. To acquire a working knowledge of hand tools.	a. Identify various hand tools. b. Understand proper care of hand tools. c. Properly use hand tools.
	2. Students will be able to develop a working knowledge of electric hand tools.	a. Identify basic electric hand tools. b. Understand proper application. c. Properly use electric hand tools. d. Understand difference and qualities.
	3. Students will develop skills in the use of machines.	a. Identify basic machines. b. Understand proper care and maintenance. c. Operate properly basic machines found in the lab.

ADVANCED INDUSTRIAL ARTS

PROGRAM GOALS	PROGRAM OBJECTIVE	SUBJECT OBJECTIVE Student will:
B. (Cont'd)	4. Student will become familiar with many of the manufacturing processes.	a. Identify manufacturing processes. b. Develop skills necessary to manufacture a product.
C. To provide for the development of skills and techniques in problem solving and creativity.	1. The student will choose a project and carry it through all steps of completion.	a. Design his own project or redesign one previously designed. b. Figure all costs in development. c. Choose correct materials. d. Develop logical steps of procedure. e. Work through problems as they arise. f. Complete projects in a suitable time frame. g. Think constructively, quickly and efficiently to solve every day problems.
D. To enable the student to recognize craftsmanship and good products design in the products of individuals and industry.	1. To establish basic principles of craftsmanship.	a. Make value judgment on a product's qualities. b. Understand the need for good craftsmanship. c. Identify the qualities of good construction and craftsmanship. d. Know what to look for when being a comsumer. e. Develop skills which will create good craftsmanship.
	2. To develop and understanding of design.	a. Differentiate between good and poor design. b. Understand the basics of goood design. c. Develop an understanding of color, texture,and shape.

ADVANCED INDUSTRIAL ARTS

PROGRAM GOAL	PROGRAM OBJECTIVES	SUBJECT OBJECTIVES Student will:
E. Develop within the student a positive attitude toward work including the ability to work for himself and with others.	1. The student will develop mature work habits and ethics.	a. Develop a time frame for a project. b. Meet required skills necessary to complete projects. c. Continue a positive attitude when problems arise. d. Complete assignments and requirements as assigned.
	2. The students will develop the ability to work alone and with others.	a. Work through problems alone. b. Work through problems with instruction. c. Work through problems with others. d. Cooperate with others while working in the lab. e. Share ideas and work with fellow students.
F. To inform the student of the avocational and career opportunities that are available in our technologically oriented society.	1. To acquaint the students with the various occupations and careers in todays industrial society.	a. Identify many of the occupations available today. b. Discuss the skill related to initial entrance into occupational areas and education required. c. See how technology changed the occupation work force and job availability. d. Assess their abilities, interests and potentialities for future employment.
	2. To inform the student of the avocational opportunities.	a. Develop a leisure time activity. b. Develop skills necessary to perform a leisure time activity.

ADVANCED INDUSTRIAL ARTS

PROGRAM GOAL	PROGRAM OBJECTIVE	SUBJECT OBJECTIVE Student will:
G. To develop within the student an attitude of respect for good health and proper safety practices.	1. To establish safe work habits for the shop and home.	a. Work safely in the shop and home. b. Develop a good understanding of proper safety practices. c. Know the basic safety rules for all tools, machines and materials used in the shop. d. Properly react to fire and tornado drills. e. Attain an attitude of safety consciousness whether working at home or in the lab. f. Understand safe practices when handling materials common to the shop and home.

DRAFTING

PROGRAM GOALS	PROGRAM OBJECTIVES Student will:	SUBJECT OBJECTIVES Student will:
A. To learn about industry in terms of its materials, processes and products.	1. Become familiar with drafting in the modern technological world.	a. View drafting as a beginning skill that opens many doors to career areas. b. Appreciate the need of communicating graphically in todays world. c. See drawing as transmitters of technological culture.
B. To develop skills with the tools, machines and processes of industry.	1. Participate in sketching and lettering.	a. Master lettering, single stroke, vertical, capital letters and numbers. b. Make sample one, two, and multiple view sketches of boxed shaped objects. c. Draw oblique, pictorial and isometric sketches. d. Sketch circles, arcs and straight lines. e. Dimension a sketch.
C. To develop skills and techniques in problem solving and creativity.	1. Learn the proper care and use of drafting equipment and instruments.	a. Draw circles and arcs with a compass. b. Use T-square, parallel edge and triangles in drawing straight lines. c. Show competency in using architect and engineers scale.
	2. Use tools in drawing geometric line relationships.	a. Draw individual lines and points in proper relationships to one another. b. Identify terms such as perpendicular, bisector, isosceles, ellipse, equilateral, and axes. c. Construct polygons, angles, triangles, squares and other figures.
	3. Learn and apply the proper procedures for drawing separate views of an object.	a. Complete a multi-view drawing, including borders and title strip. b. Identify and draw the appropriate lines (center, hidden, visible) that are used in a drawing.

PROGRAM GOALS	PROGRAM OBJECTIVES Student will:	SUBJECT OBJECTIVES Student will:
C. (Cont'd)	3. (Cont'd)	c. Understand the relationship of views and the angles of projection in multi-view drawing, including auxiliary views.
	4. Recognize the importance of describing the size of an object through accurate dimensions.	a. Use lines and symbols to verify a dimension. b. Select and note distances in determining dimensions. c. Apply the proper placement of dimensions.
	5. Draw different types of sectional views.	a. Identify American National Standard Symbols for section lining. b. Name terms in the section drawing such as cutting plane, types of sectional views, and intersections. c. Draw at least three drawing representing different sectional view.
	6. Develop skills in drawing isometric views.	a. Demonstrate ability to make an accurate isometric drawing. b. Identify positions for isometric axes. c. Show competency in drawing nonisometric lines.
	7. Learn and apply proper procedure for drawing auxiliaries.	a. Draw an auxilliary view from principal views. b. Explain why auxiliary views are needed.
	8. Show skillful knowledge of dimensions, notes and units.	a. Show competency in drawing aligned and unidirectional dimensions. b. Master limited space dimensioning.

PROGRAM GOALS	PROGRAM OBJECTIVES Student will:	SUBJECT OBJECTIVES Student will:
C. (Cont'd)	9. Develop skill in drawing threads and fasteners.	a. Identify the more common screw threads and related terminology. b. Draw single screw thread according to accepted standard. c. Draw threads fasteners (bolts, nuts, screws, etc.)
	10. Draw and communicate using surface developments.	a. Know and demonstrate skill in drawing intersecting lines and developments. b. Construct models of intersecting cylinders, squares, and cones.
	11. Become aware of the problems inherent in residential design and construction.	a. Learn the tools, techniques and symbols of architectural drafting. b. Draw a complete set of working drawings. c. Become aware of modern methods and materials used in house construction. d. Draw a plot plan of a typical residence that would pass for a bulding permit. e. Demonstrate a familiarity with the building codes of the community.

GRAPHIC ARTS 9-12

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVE Student will:
A. To develop an attitude of respect for good health and proper safety practices.	1. View safety as an essential part of the printing processes.	a. Safely operate the paper cutter, offset press and letter press. b. Know and practice safety in handling chemicals in screen printing and photographic activities.
B. To provide a historical prospective of the graphic arts.	2. Trace the development of the graphic arts through history.	a. Describe the first printing process. b. Describe early paper making, listing ingredients and steps in manufacture. c. Understand printing terms and apply then to daily laboratory use.
C. To become informed of avocational and career opportunities that are available in our technologically oriented society.	1. Demonstrate knowledge of technical, general and occupational information in the field of graphic arts.	a. List and describe eight basic printing proceses and the related occupations. b. Do a personal "resume" making: 1) rough 2) camera ready 3) halftone 4) strip negatives on flat 5) burn plate and run off press
D. To develop a positive attitude toward work including the abilty to work for himself and with others.	1. Identify the basic processes that are presently in use to produce the printed word.	a. List and describe the eight basic methods of placing an image on paper.
	2. Demonstrate knowledge and understanding of relief printing of a raised image.	a. Become familiar with handset foundry type and basic printing terminology. b. Identify processes in composition such as measuring, justifying, setting, spacing, centering, flush-left, etc.
	3. Operate the hand fed letter press to print a job.	a. Demonstrate the ability to ink, dress platen, set gauge pins, make ready, feed the press, and clean upon completion.

PROGRAM GOAL	PROGRAM OBJECTIVE Student will:	SUBJECT OBJECTIVE Student will:
D. (Cont'd)	4. Particpate in silk screen printing process.	a. Develop suitable design for screen printing. b. Cut stencil and adhere properly. c. Transfer image using the screen frame.
	5. Gain knowledge and operational skills in in offset lithography.	a. Understand the lithographic printing process. b. Prepare offset for printing. c. Burn and develop offset plate. d. Expose litho film, using process camera. e. Install plate and operate the offset press. f. Strip negatives in masking sheet.
E. To develop skills and techniques in problem solving and creativity.	1. Gain experience in production printing.	a. Print programs, tickets, envelopes, stationery, and other products. b. Use major equipment in advanced set-ups.
	2. Gain expertise in printing layout, design, and copy preparation.	a. Identify the duties of the layout artist. b. Know the common tools and materials used. c. Use adhesive and transfer lettering. d. Use "Kroy" type, incorporating proper letter spacing. e. Compose "art" electronically using a program on the computer. f. Have exposure to the word-processing program. g. Know the principles of proportion, harmony, arrangement, and balance, and apply them to layouts.