

2010 Mississippi Curriculum Framework

Postsecondary Ophthalmic Technology

(Program CIP-51.1801 – Opticianry/Dispensing Optician)

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Standards in this document are based on information from the following organizations:

Standards and Guidelines for Ophthalmic Technology Programs	Commission on Opticianry Accreditation (COA), <i>Essentials of an Accredited Program for Opticianry</i> (2009), used with permission. (The COA does not accredit the program/curriculum or has in any way reviewed or approved the program/curriculum.)
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Preface

Ophthalmic Technology Research Synopsis

Articles, books, Web sites, and other materials listed at the end of each course were considered during the revision process. Specific journals, articles, and sources were especially useful in providing insight into trends and issues in the field. These references are suggested for use by instructors and students during the study of the topics outlined.

Industry advisory team members from colleges throughout the state were asked to give input related to changes to be made to the curriculum framework. Specific comments related to soft skills needed in this program included people skills, eagerness to work, positive attitude, integrity, articulate, great vocabulary, and neat appearance. Occupational-specific skills stated included knowledge of optics, operating edging equipment, adjusting frames, mathematics, and strong communications skills. Safety practices emphasized included proper use of equipment, especially when cleaning or repairing equipment, and following all lab rules and regulations.

The instructor from the college where the program is offered was also asked to give input on changes to be made to the curriculum framework. No specific comments related to this program from the Advisory Committee members were indicated. Changes suggested for the curriculum included changing the name of the following courses: Laboratory Management and Inventory Control I (OPT 1313) to Laboratory Management and Inventory Control; Laboratory Management and Inventory Control II (OPT 1323) to Business Management for Opticians; and Externship (OPT 2916) to Internship. Also, move Externship (OPT 2916) from Second Year Summer Semester to Second Year Second Semester. The course prerequisites were reviewed and changed as needed.

Curriculum

The following national standards were referenced in each course of the curriculum:

- CTB/McGraw-Hill LLC *Tests of Adult Basic Education, forms 7 and 8* Academic Standards
- *21st Century Skills*
- *Commission on Opticianry Accreditation, Essentials of an Accredited Educational Program for Opticianry*

Industry and instructor comments, along with current research, were considered by the curriculum revision team during the revision process, and changes were made as needed and appropriate. Many of the skills and topics noted in the research were already included in the curriculum framework. Specific changes made to the curriculum at the March 25, 2009, curriculum revision meeting included the following:

- Competencies and objectives were reviewed to ensure accuracy and appropriateness.
- Depth of knowledge level was added at each competency level.
- The course name for Laboratory Management and Inventory Control I (OPT 1313) was changed to Laboratory Management and Inventory Control.
- The course name for Laboratory Management and Inventory Control II (OPT 1323) was changed to Business Management for Opticians.

- The course name for Externship (OPT 2916) was changed to Internship and was moved from Second Year Summer Semester to Second Year Second Semester.
- The reference list was updated.
- The Recommended Tools and Equipment list was updated.

Assessment

Students will be assessed using the Postsecondary Ophthalmic Technology MS-CPAS2 test.

Professional Learning

It is suggested that instructors participate in professional learning related to the following concepts:

- How to use the program Blackboard site
- Differentiated instruction – To learn more about differentiated instruction, please go to http://www.paec.org/teacher2teacher/additional_subjects.html, and click on Differentiated Instruction. Work through this online course, and review the additional resources.

Foreword

As the world economy continues to evolve, businesses and industries must adopt new practices and processes in order to survive. Quality and cost control, work teams and participatory management, and an infusion of technology are transforming the way people work and do business. Employees are now expected to read, write, and communicate effectively; think creatively, solve problems, and make decisions; and interact with each other and the technologies in the workplace. Vocational–technical programs must also adopt these practices in order to provide graduates who can enter and advance in the changing work world.

The curriculum framework in this document reflects these changes in the workplace and a number of other factors that impact on local vocational–technical programs. Federal and state legislation calls for articulation between high school and community college programs, integration of academic and vocational skills, and the development of sequential courses of study that provide students with the optimum educational path for achieving successful employment. National skills standards, developed by industry groups and sponsored by the U.S. Department of Education and Labor, provide vocational educators with the expectations of employers across the United States. All of these factors are reflected in the framework found in this document.

Referenced throughout the courses of the curriculum are the 21st Century Skills, which were developed by the Partnership for 21st Century Skills, a group of business and education organizations concerned about the gap between the knowledge and skills learned in school and those needed in communities and the workplace. A portion of the 21st Century Skills addresses learning skills needed in the 21st century, including information and communication skills, thinking and problem-solving skills, and interpersonal and self-directional skills. The need for these types of skills has been recognized for some time, and the 21st Century Skills are adapted in part from the 1991 report from the U.S. Secretary of Labor’s Commission on Achieving Necessary Skills (SCANS). Another important aspect of learning and working in the 21st century involves technology skills, and the International Society for Technology in Education, developers of the National Educational Technology Standards (NETS), were strategic partners in the Partnership for 21st Century Skills.

Each postsecondary program of instruction consists of a program description and a suggested sequence of courses that focus on the development of occupational competencies. Each vocational–technical course in this sequence has been written using a common format that includes the following components:

- Course Name – A common name that will be used by all community/junior colleges in reporting students
- Course Abbreviation – A common abbreviation that will be used by all community/junior colleges in reporting students
- Classification – Courses may be classified as the following:
 - Vocational–technical core – A required vocational–technical course for all students

- Area of concentration (AOC) core – A course required in an area of concentration of a cluster of programs
 - Vocational–technical elective – An elective vocational–technical course
 - Related academic course – An academic course that provides academic skills and knowledge directly related to the program area
 - Academic core – An academic course that is required as part of the requirements for an associate degree
- Description – A short narrative that includes the major purpose(s) of the course and the recommended number of hours of lecture and laboratory activities to be conducted each week during a regular semester
 - Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course
 - Corequisites – A listing of courses that may be taken while enrolled in the course
 - Competencies and Suggested Objectives – A listing of the competencies (major concepts and performances) and of the suggested student objectives that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75 percent of the time allocated to each course. The remaining 25 percent of each course should be developed at the local district level and may reflect the following:
 - Additional competencies and objectives within the course related to topics not found in the State framework, including activities related to specific needs of industries in the community college district
 - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
 - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed/revised
 - Activities that implement components of the Mississippi Tech Prep initiative, including integration of academic and vocational–technical skills and coursework, school-to-work transition activities, and articulation of secondary and postsecondary vocational–technical programs
 - Individualized learning activities, including worksite learning activities, to better prepare individuals in the courses for their chosen occupational area
- Sequencing of the course within a program is left to the discretion of the local district. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors.

- Programs that offer an Associate of Applied Science degree must include a minimum 15 semester credit hour academic core. Specific courses to be taken within this core are to be determined by the local district. Minimum academic core courses are as follows:
 - 3 semester credit hours Math/Science Elective
 - 3 semester credit hours Written Communications Elective
 - 3 semester credit hours Oral Communications Elective
 - 3 semester credit hours Humanities/Fine Arts Elective
 - 3 semester credit hours Social/Behavioral Science Elective

It is recommended that courses in the academic core be spaced out over the entire length of the program so that students complete some academic and vocational–technical courses each semester. Each community/junior college has the discretion to select the actual courses that are required to meet this academic core requirement.

- In instances where secondary programs are directly related to community and junior college programs, competencies and suggested objectives from the high school programs are listed as Baseline Competencies. These competencies and objectives reflect skills and knowledge that are directly related to the community and junior college vocational–technical program. In adopting the curriculum framework, each community and junior college is asked to give assurances that:
 - Students who can demonstrate mastery of the Baseline Competencies do not receive duplicate instruction and
 - Students who cannot demonstrate mastery of this content will be given the opportunity to do so.
- The roles of the Baseline Competencies are to do the following:
 - Assist community/junior college personnel in developing articulation agreements with high schools
 - Ensure that all community and junior college courses provide a higher level of instruction than their secondary counterparts
- The Baseline Competencies may be taught as special “Introduction” courses for 3–6 semester hours of institutional credit that will not count toward associate degree requirements. Community and junior colleges may choose to integrate the Baseline Competencies into ongoing courses in lieu of offering the “Introduction” courses or may offer the competencies through special projects or individualized instruction methods.
- Technical elective courses have been included to allow community colleges and students to customize programs to meet the needs of industries and employers in their area.

In order to provide flexibility within the districts, individual courses within a framework may be customized by doing the following:

- Adding new competencies and suggested objectives
- Revising or extending the suggested objectives for individual competencies
- Integrating baseline competencies from associated high school programs

- Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the State Board for Community and Junior Colleges [SBCJC] of the change)

In addition, the curriculum framework as a whole may be customized by doing the following:

- Resequencing courses within the suggested course sequence
- Developing and adding a new course that meets specific needs of industries and other clients in the community or junior college district (with SBCJC approval)
- Utilizing the technical elective options in many of the curricula to customize programs

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Program Description

Ophthalmic Technology is a 2-year technical program. Upon successful completion of the program, the student is awarded the Associate of Applied Science Degree. The program is comprised of both vocational–technical and academic courses.

Opticianry is defined as “the art and science of optics to compounding, filing, and adapting of ophthalmic prescriptions, products and accessories.” Opticianry describes the preparation (making) of ophthalmic lenses, setting them into spectacle frames, and dispensing (fitting and delivering) them to the wearer. These acts include a large number of activities or trades, ranging from the mechanical act of lens grinding to the personal service of the selection, fitting, and adjusting of a pair of glasses to an individual’s face, selling, and public relations.

Academic, workplace, and industry standards are referenced at the end of each course where applicable. Although the program is not accredited by the Commission on Opticianry Accreditation, the industry standards are taken from the Essentials of an Accredited Educational Program for Opticianry.

Suggested Course Sequence*

Ophthalmic Technology**

FIRST YEAR

3 sch Ophthalmic Optics I (OPT 1113) 4 sch Optics Laboratory Techniques I (OPT 1214) 3 sch Laboratory Management and Inventory Control (OPT 1313) 3 sch Written Communications Elective 3 sch Social/Behavioral Science Elective <hr style="width: 10%; margin-left: 0;"/> 16 sch	3 sch Ophthalmic Optics II (OPT 1123) 4 sch Optics Laboratory Techniques II (OPT 1224) 3 sch Business Management for Opticians (OPT 1323) 3 sch Ophthalmic Dispensing I (OPT 1413) 3 sch Math/Science Elective <hr style="width: 10%; margin-left: 0;"/> 16 sch
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SECOND YEAR

3 sch Ophthalmic Dispensing II (OPT 2423) 3 sch Optical Theory and Instrumentation (OPT 2513) 3 sch Dispensing Clinic I (OPT 2613) 3 sch Humanities/Fine Arts Elective 3 sch Principles of Accounting I (ACC 1213) 3 sch Elective*** <hr style="width: 10%; margin-left: 0;"/> 18 sch	3 sch Ophthalmic Dispensing III (OPT 2433) 3 sch Dispensing Clinic II (OPT 2623) 3 sch Fundamentals of Microcomputer Applications (CPT 1113) or Introduction to Computer Concepts (CSC 1113) 3 sch Oral Communications Elective 6 sch Internship (OPT 2916) <hr style="width: 10%; margin-left: 0;"/> 18 sch
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* Students who lack entry-level skills in math, English, science, and so forth will be provided related studies.

*** Elective must be approved by instructor.

Ophthalmic Technology Courses

Course Name: Ophthalmic Optics I

Course Abbreviation: OPT 1113

Classification: Vocational–Technical Core

Description: This course is a study of basic principles of light. Topics covered include anatomy and physiology of the eye, visual conditions of the human eye, and appropriate lens to correct these conditions. (3 sch: 3-hr lecture)

Prerequisite: None

Competencies and Suggested Objectives	
1.	Discuss the structure and function of the eye. ^{OPT 4} a. Identify the structures of the eye. b. Explain the functions of each structure of the eye.
2.	Discuss principles of light. ^{OPT 2} a. Explain wave theory. b. Explain light refraction.
3.	Explain conditions of the human eye. ^{OPT 2, OPT 4} a. Define and cite conditions of the human eye. b. Identify the type of lens that corrects conditions of the eye.
4.	Interpret the ophthalmic prescription. ^{OPT 2} a. Define the procedure for filling an ophthalmic prescription. b. Determine the total lens power as taken from the optical cross. c. Determine the appropriate base curve for a given prescription.
5.	Discuss the lens clock. ^{OPT 2, OPT 7, OPT 10} a. Name the parts of a lens clock. b. Describe the use of a lens clock.
6.	Differentiate the types of multifocal lenses. ^{OPT 2} a. Identify, by sight, types of multifocal lenses. b. Describe the characteristics of types of multifocal lenses.
7.	Discuss factors affecting lenses. ^{OPT 2, OPT 5} a. Identify the different factors that affect the outcome of lenses. b. Discuss ideal lens options based on conditions of the human eye.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 2	Analyze and interpret prescriptions.
OPT 4	Identify the human eye structure, function, and pathology.
OPT 5	Assist the patient/customer in selection of proper frames and lenses.

- OPT 7 Neutralize lenses, and verify eyewear/vision aids prescriptions.
OPT 10 Demonstrate proficiency in the operation and function of equipment.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
- S1 Vowel (short, long)
- S2 Consonant (variant spelling, silent letter)
- S3 Structural Unit (root, suffix)

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21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

- American Board of Opticianry-National Contact Lens Examiners. (n.d.). Retrieved May 12, 2009, from <http://www.abo-ncle.org/>
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Course Name: Ophthalmic Optics II

Course Abbreviation: OPT 1123

Classification: Vocational–Technical Core

Description: This course is a continuation of Ophthalmic Optics I. Topics include the theory of optical instruments, positive and negative cylinders, prisms, vertex distance, and frame selection. (3 sch: 3-hr lecture)

Pre/corequisite: None

Competencies and Suggested Objectives	
1. Explain positive and negative cylinders. ^{OPT 2}	<ul style="list-style-type: none"> a. Define positive and negative cylinders. b. Discuss how positive and negative cylinders affect an ophthalmic lens.
2. Explain optical effects related to decentration. ^{OPT 2, OPT 8}	<ul style="list-style-type: none"> a. Explain the purpose of decentering the lens. b. Discuss the procedure used to determine where the optical center of a lens is placed. c. Define the effect a prism has on a ray of light. d. Determine the location of the major reference point. e. Determine how to locate the pupillary distance for near and far vision.
3. Determine the effects of the lens as it is positioned before the eye. ^{OPT 2, OPT 8}	<ul style="list-style-type: none"> a. Calculate the effective power of the lens due to shift in vertex distance. b. Determine the amount of compensation due to the shift in vertex distance.
4. Explain procedures to determine pupillary distance. ^{OPT 3, OPT 10}	<ul style="list-style-type: none"> a. Discuss methods for determining pupillary distance. b. Explain methods used with the special needs population.
5. Explain the effects of prisms on an ophthalmic lens. ^{OPT 2}	<ul style="list-style-type: none"> a. Define the relationship between prism and decentration. b. Define wanted prism. c. Define unwanted prism. d. Calculate prism amount, and determine direction.
6. Discuss basic knowledge of frame selection. ^{OPT 3, OPT 6}	<ul style="list-style-type: none"> a. Determine the appropriate frame for a prescription. b. Explain fitting characteristics of different frames. c. Discuss wearing habits of different individuals.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 2	Analyze and interpret prescriptions.
OPT 3	Communicate effectively with patient/customer.
OPT 6	Determine patient/customer physiognomic (facial and eye) measurements.
OPT 8	Adapt and fit corrective eyewear/vision aids.

OPT 10 Demonstrate proficiency in the operation and function of equipment.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
- S1 Vowel (short, long)
- S2 Consonant (variant spelling, silent letter)
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21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

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- American Board of Opticianry-National Contact Lens Examiners. (n.d.). Retrieved May 12, 2009, from <http://www.abo-ncle.org/>
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Course Name: Optics Laboratory Techniques I

Course Abbreviation: OPT 1214

Classification: Vocational–Technical Core

Description: This course will introduce the student to all basic equipment necessary to process the lens through the surface operation. Emphasis will be placed on basic safety and on how to prepare, operate, and maintain equipment. (4 sch: 8-hr lab)

Pre/corequisite: Ophthalmic Optics I (OPT 1113), Laboratory Management and Inventory Control I (OPT 1313)

Competencies and Suggested Objectives	
1. Calculate surface layout for glass and plastic lenses. <small>OPT 1, OPT 10</small>	<ol style="list-style-type: none"> a. Calculate shop slip. b. Mark the lens.
2. Block the lens. <small>OPT 9, OPT 10</small>	<ol style="list-style-type: none"> a. Demonstrate precoating of lenses. b. Select lens blocks. c. Block lens using alloy blocker.
3. Generate the lens. <small>OPT 9, OPT 10, OPT 12</small>	<ol style="list-style-type: none"> a. Set curves on generator. b. Set thickness dial. c. Correct insert lens in lens chuck of generator. d. Remove lens from generator, and inspect curve and thickness.
4. Fine-grind the lens (plastic), using two step procedure, to include the following: <u>First fine</u> <small>OPT 9, OPT 10, OPT 12</small>	<ol style="list-style-type: none"> a. Select lap, and inspect for accuracy. b. Place first fining pad on lap. c. Place lap on lap table of fining machine making sure lap is seated. d. Place lens on machine with axis pins corresponding with axis of lens block. e. Apply pressure. f. Set timer to start machine. g. Upon completion of cycle, remove, clean, and inspect lens.
<u>Second fine</u> <small>OPT 9, OPT 10, OPT 12</small>	<ol style="list-style-type: none"> h. Place second fine pad on lap over first fine pad, and repeat steps 4c through 4g above. i. Remove lap from machine; clean lap for polishing procedure.
5. Polish the lens. <small>OPT 9, OPT 10, OPT 12</small>	<ol style="list-style-type: none"> a. Place polishing pad on lap used for fining. b. Place lap on lap table of machine and tighten. c. Place lens on machine making sure axis pins are in place. d. Set timer to start machine. e. Upon completion of cycle, remove, clean, and inspect. f. Remove lap from machine, clean lap, and replace to proper place.
6. Deblock the lens to include the following: <small>OPT 9, OPT 10</small>	

	<ul style="list-style-type: none"> a. Place lens in deblocker to separate lens from block. b. Remove lens from deblocker. c. Clean and inspect lens. d. Remove block from blocker, clean a block, and replace it in proper storage.
7.	Demonstrate lensometry. <small>OPT 7, OPT 9, OPT 10</small> <ul style="list-style-type: none"> a. Demonstrate the procedure used to determine single vision lenses. b. Demonstrate the procedure used to determine the power of a bifocal lens. c. Demonstrate the procedure used to determine the power of a trifocal lens.
8.	Demonstrate equipment maintenance. <small>OPT 9, OPT 10, OPT 12</small> <ul style="list-style-type: none"> a. Demonstrate lubrication of machinery. b. Demonstrate the procedure for checking coolants. c. Demonstrate the procedure for changing coolants.
9.	Perform basic safety procedures. <small>OPT 9</small> <ul style="list-style-type: none"> a. Assist with basic emergency procedures to include falls, seizures, and fainting. b. Demonstrate procedures for first aid for sudden illness and accident. c. Perform one-man adult CPR.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 1	Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
OPT 7	Neutralize lenses, and verify eyewear/vision aids prescriptions.
OPT 9	Apply rules and regulations for equipment safety
OPT 10	Demonstrate proficiency in the operation and function of equipment.
OPT 12	Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

R1	Interpret Graphic Information (forms, maps, reference sources)
R2	Words in Context (same and opposite meaning)
R3	Recall Information (details, sequence)
R4	Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
R5	Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1	Addition of Whole Numbers (no regrouping, regrouping)
M2	Subtraction of Whole Numbers (no regrouping, regrouping)
M3	Multiplication of Whole Numbers (no regrouping, regrouping)
M4	Division of Whole Numbers (no remainder, remainder)
M5	Decimals (addition, subtraction, multiplication, division)
M6	Fractions (addition, subtraction, multiplication, division)
M7	Integers (addition, subtraction, multiplication, division)
M8	Percents
M9	Algebraic Operations

- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
- S1 Vowel (short, long)
- S2 Consonant (variant spelling, silent letter)
- S3 Structural Unit (root, suffix)

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21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

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Course Name: Optics Laboratory Techniques II

Course Abbreviation: OPT 1224

Classification: Vocational–Technical Core

Description: This course is a continuation of Optics Laboratory Techniques I. Emphasis will be placed on lens inspection, cutting and edging, heat treatment, lens insertion, inspection, and tinting. (4 sch: 8-hr lab)

Pre/corequisite: Ophthalmic Optics II (OPT 1123), Laboratory Management and Inventory Control II (OPT 1323), Ophthalmic Dispensing I (OPT 1413), Optics Laboratory Techniques I (OPT 1214)

Competencies and Suggested Objectives	
1. Inspect the finished lens. <small>OPT 1, OPT 7, OPT 11</small>	<ol style="list-style-type: none"> a. Check lens for imperfections. b. Check lens for power. c. Spot lens using lens marker on lensometer.
2. Lay out lens for edging. <small>OPT 1, OPT 7, OPT 11</small>	<ol style="list-style-type: none"> a. Check frame size. b. Calculate decentration. c. Calculate segment drop. d. Set layout marker to correct decentration. e. Set layout marker to correct seg. drop. f. Place lens in layout marker making sure lens is lined up correctly. g. Mark and remove lens.
3. Block the lens for edging. <small>OPT 9, OPT 10</small>	<ol style="list-style-type: none"> a. Select edging block. b. Place edge blocking pad on block. c. Place block in blocker. d. Align lens making sure axis line of lens is aligned with axis line of blocker. e. Block lens.
4. Edge the lens. <small>OPT 9, OPT 10, OPT 12</small>	<ol style="list-style-type: none"> a. Select frame pattern. b. Place pattern on edger. c. Calculate edger setting. d. Set edger to edger calculation. e. Set bevel location. f. Place lens in edger. g. Edge lens for given frame size. h. Remove flakes from bevel of lens using hand edger.
5. Heat treat the glass lenses. <small>OPT 9, OPT 10, OPT 12</small>	<ol style="list-style-type: none"> a. Preheat heat treating unit. b. Calculate time required for heat treatment. c. Prepare lens for treatment.

	<ul style="list-style-type: none"> d. Place in unit elevator. e. Set timer, and begin the cycle. f. Remove lens from machine. g. Check lens for maltese cross using polariscope. h. Drop ball test lens for strength.
6.	Insert lens in plastic frame. ^{OPT 9, OPT 10} <ul style="list-style-type: none"> a. Heat frame using warmer. b. Insert lens. c. Straighten and align frame.
7.	Insert lens in metal frame. ^{OPT 9, OPT 10} <ul style="list-style-type: none"> a. Remove eyewire screws. b. Place lens in bevel of frame. c. Replace screws. d. Straighten and align frame and lenses.
8.	Complete final inspection. ^{OPT 2, OPT 7, OPT 11} <ul style="list-style-type: none"> a. Verify frame alignment. b. Verify pupillary distance. c. Verify segment height. d. Verify lens axis. e. Verify lens power. f. Verify overall appearance of glasses.
9.	Tint plastic lens. ^{OPT 9, OPT 12} <ul style="list-style-type: none"> a. Preheat dye unit. b. Clean lens. c. Dip in lens preparation. d. Place lens in proper dye depending on color and tint desired. e. Remove lens from dye and wash.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 1	Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
OPT 2	Analyze and interpret prescriptions.
OPT 7	Neutralize lenses, and verify eyewear/vision aids prescriptions.
OPT 9	Apply rules and regulations for equipment safety
OPT 10	Demonstrate proficiency in the operation and function of equipment.
OPT 11	Maintain patient/customer records.
OPT 12	Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

R1 Interpret Graphic Information (forms, maps, reference sources)

- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
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21st Century Skills

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Course Name: Laboratory Management and Inventory Control

Course Abbreviation: OPT 1313

Classification: Vocational–Technical Core

Description: This course will serve as an introduction to supplies and materials used in the ophthalmic laboratories and an introduction to mathematical optical calculations. Laboratory safety procedures will be discussed. Laboratory inventory and management skills will be demonstrated using computer software. (3 sch: 3-hr lecture)

Prerequisite: None

Competencies and Suggested Objectives	
1. Discuss laboratory management.	OPT 2, OPT 11, OPT 12
a. Identify supplies and materials used in the ophthalmic laboratory.	
b. Describe inventory procedures for frames and lenses.	
2. Discuss laboratory safety as related to ophthalmic technology.	OPT 2, OPT 9, OPT 12
a. List the hazard areas of the laboratory.	
b. Develop safety procedures to meet a described laboratory layout.	
3. Describe and use inventory and laboratory management software.	OPT 11, OPT 12
a. Describe computerized management control for laboratory and inventory.	
b. Demonstrate practical use of management control software.	
4. Perform mathematical calculation related to optics.	OPT 2
a. Perform basic business calculations.	
b. Perform optical calculations.	

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 2	Analyze and interpret prescriptions.
OPT 9	Apply rules and regulations for equipment safety
OPT 11	Maintain patient/customer records.
OPT 12	Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

R1	Interpret Graphic Information (forms, maps, reference sources)
R2	Words in Context (same and opposite meaning)
R3	Recall Information (details, sequence)
R4	Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
R5	Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1	Addition of Whole Numbers (no regrouping, regrouping)

- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
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Course Name: Business Management for Opticians

Course Abbreviation: OPT 1323

Classification: Vocational–Technical Core

Description: This course is a continuation of Laboratory Management and Inventory Control I. Emphasis of this course will be on small business management concepts as related to an optical business. (3 sch: 3-hr lecture)

Prerequisite: None

Competencies and Suggested Objectives	
1.	Apply small business management concepts to an optical business. ^{OPT 12} a. Identify the advantages of various types of optical business ownerships. b. Develop a personnel procedure for employees working in a particular environment. c. Compare similar facilities in terms of operation and employee benefits.
2.	Develop plans for a complete wholesale optical business, and give start-up costs. Plans must include the following: ^{OPT 12} a. Complete inventory for in-house use as well as resale: (1) lenses (2) frames (3) supplies b. Cost of equipment. c. Projected payroll (total salaries for one month) d. Projected other costs (building, utilities, insurance)

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 12 Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)

- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
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- S1 Vowel (short, long)
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21st Century Skills

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Course Name: Ophthalmic Dispensing I

Course Abbreviation: OPT 1413

Classification: Vocational–Technical Core

Description: This course is a foundation course that will serve as a lecture introduction to ophthalmic dispensing and related areas. Topics include frame parts, selection, lens positioning and insertion, frame fitting, and progressive lenses. (3 sch: 3-hr lecture)

Prerequisite: None

Competencies and Suggested Objectives	
1. Discuss the basic frame parts used in eyewear. ^{OPT 1}	<ul style="list-style-type: none"> a. Label the basic frame parts used in eyewear. b. Explain the basic frame parts used in eyewear.
2. Develop skills in frame selection. ^{OPT 1, OPT 6, OPT 8}	<ul style="list-style-type: none"> a. Explain the frame dimensional properties. b. Describe the accurate methodology for measuring the interpupillary distance, and explain its relationship with the eyeglass lens. c. Describe frame selection based on facial anatomy.
3. Explain lens positioning in the frame. ^{OPT 2}	<ul style="list-style-type: none"> a. Explain the optical center placement. b. Explain the multifocal height. c. Determine the minimum lens blank size.
4. Explain the techniques of inserting the lens in the frame to achieve a neat professional appearance. ^{OPT 8}	<ul style="list-style-type: none"> a. Describe methods of lens insertion. b. Explain standard alignment and frame fitting.
5. Summarize the art of fitting the frame to a client. ^{OPT 1, OPT 8}	<ul style="list-style-type: none"> a. Explain fitting of plastic frames. b. Explain fitting of metal frames. c. Explain fitting of rimless mounting. d. Explain fitting of half-eye frames. e. Explain nylon supra frames.
6. Explain the lens design and proper fitting techniques of a progressive lens. ^{OPT 1, OPT 8}	<ul style="list-style-type: none"> a. Discuss lens design of a progressive lens. b. Describe fitting techniques of a progressive lens.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

- OPT 1 Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
- OPT 2 Analyze and interpret prescriptions.

OPT 8 Adapt and fit corrective eyewear/vision aids.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
- S1 Vowel (short, long)
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21st Century Skills

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Course Name: Ophthalmic Dispensing II

Course Abbreviation: OPT 2423

Classification: Vocational–Technical Core

Description: This course is an introduction to prescription analysis and interpretation. Various types of Rxs will be discussed as to what types of lens and frames should be considered for the final product. Emphasis will be placed on the effect of the Rx as related to the patient's needs and wants. Tints, the thickness factor, cosmetic considerations, and the overall utility of the final product will be discussed. Business communication skills will also be introduced. (3 sch: 3-hr lecture)

Prerequisite: Ophthalmic Dispensing I (OPT 1413)

Competencies and Suggested Objectives	
1. List lens and frame types that satisfy the prescription requirements.	OPT 2, OPT 8
a. Identify frame types used with positive lenses.	
b. Identify frame types used with negative lenses.	
2. Discuss lens tints as related to the client's needs and Rx requirements.	OPT 1, OPT 2, OPT 3, OPT 8
a. Interpret the transmission chart of a particular lens tint.	
b. Describe the effects of tints as related to the patient's needs and Rx requirements.	
3. Determine information relative to the final Rx.	OPT 7, OPT 8
a. Calculate decentration.	
b. Calculate blank size.	
c. Determine base curve selection.	
4. Explain business communication skills.	OPT 1, OPT 3, OPT 12
a. List aspects of communication including communication between the dispenser and a client.	
b. Discuss the importance of visual communication.	
c. Discuss the importance of verbal communication.	
d. Discuss the importance of proper telephone etiquette.	

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 1	Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
OPT 2	Analyze and interpret prescriptions.
OPT 3	Communicate effectively with patient/customer.
OPT 7	Neutralize lenses, and verify eyewear/vision aids prescriptions.
OPT 8	Adapt and fit corrective eyewear/vision aids.
OPT 12	Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
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- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
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Course Name: Ophthalmic Dispensing III

Course Abbreviation: OPT 2433

Classification: Vocational–Technical Core

Description: This course is a continuation of Ophthalmic Dispensing II. Emphasis will be placed on the more advanced and unusual prescription related to ophthalmic dispensing and on sales techniques. Topics to improve the ophthalmic dispenser's relationship with fellow opticians, optometrists, ophthalmologists, wholesalers, manufacturers, and employees will be discussed. (3 sch: 3-hr lecture)

Prerequisite: Ophthalmic Dispensing II (OPT 2423)

Competencies and Suggested Objectives	
1. Compare the optical difference between special and regular lenses. ^{OPT 1, OPT 2, OPT 8, OPT 11}	<ol style="list-style-type: none"> Describe the different types of invisible lenses and cataract lenses. List the fitting procedure for cataract lenses and invisible lenses. Describe the need for occupational safety eyewear.
2. Discuss the special needs client. ^{OPT 1, OPT 8, OPT 11}	<ol style="list-style-type: none"> Describe the various types of eyewear used for the special needs clients. Explain how eyewear is fitted for special needs clients.
3. Discuss selling techniques. ^{OPT 1, OPT 5}	<ol style="list-style-type: none"> Examine business ethics. Discuss high and low pressure selling techniques.
4. Discuss the relationship between the wholesale supplier and the retailer. ^{OPT 12}	<ol style="list-style-type: none"> Relate problems of a salesperson. Analyze the attitude of the buyer. Discuss supply lab problems on the wholesale level.
5. Discuss employability skills. ^{OPT 12}	<ol style="list-style-type: none"> Explain responsibilities of the employee. Discuss employee appearance. Complete an application. Write a resume. Write a letter of resignation.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 1	Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
OPT 2	Analyze and interpret prescriptions.
OPT 5	Assist the patient/customer in selection of proper frames and lenses.
OPT 8	Adapt and fit corrective eyewear/vision aids.
OPT 11	Maintain patient/customer records.

OPT 12 Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
- S1 Vowel (short, long)
- S2 Consonant (variant spelling, silent letter)
- S3 Structural Unit (root, suffix)

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21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills

CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

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Course Name: Optical Theory and Instrumentation

Course Abbreviation: OPT 2513

Classification: Vocational–Technical Core

Description: This course is an in-depth look into the basic theoretical principles of optical theory, as related to lenses, fitting problems, and instrumentation. Such topics as reflection, refraction, magnification, and object-location will be discussed. (3 sch: 3-hr lecture)

Prerequisite: Ophthalmic Optics I (OPT 1113)

Competencies and Suggested Objectives	
1. Describe the action of a light ray as it passes through an optical surface. ^{OPT 2}	<ol style="list-style-type: none"> a. Describe the action of a single ray of light and how it is affected when passing through a transparent optical surface. b. Describe the action of a curved surface on more than one ray of light.
2. Discuss lens design. ^{OPT 2}	<ol style="list-style-type: none"> a. Explain how lenses can be made in a variety of forms, with many forms possible for a lens of the same power. b. Explain the factors that affect lens functions from its original design through its final position in the frame.
3. Discuss prisms. ^{OPT 2, OPT 7}	<ol style="list-style-type: none"> a. Define Prentice's rule. b. Calculate prism for a given Rx.
4. Describe the effect of near addition. ^{OPT 2, OPT 7}	<ol style="list-style-type: none"> a. Explain the concept of near addition. b. Calculate the near power of a lens.
5. Examine vertical prismatic imbalance. ^{OPT 2}	<ol style="list-style-type: none"> a. Discuss bicentric grinding. b. Calculate vertical prismatic imbalance. c. Explain the procedure for bicentric grinding.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

- OPT 2 Analyze and interpret prescriptions.
 OPT 7 Neutralize lenses, and verify eyewear/vision aids prescriptions.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
 R2 Words in Context (same and opposite meaning)
 R3 Recall Information (details, sequence)

- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)
- S1 Vowel (short, long)
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21st Century Skills

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- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

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Course Name: Dispensing Clinic I

Course Abbreviation: OPT 2613

Classification: Vocational–Technical Core

Description: This course is an on-campus clinical experience operated by the Ophthalmic Dispensing students. Practical clinical procedures will be practiced and proficiency demonstrated. (3 sch: 6-hr lab)

Pre/corequisites: Ophthalmic Dispensing II (OPT 2423), Optical Theory and Instrumentation (OPT 2513)

Competencies and Suggested Objectives	
1. Demonstrate small business procedures.	OPT 1, OPT 2, OPT 3, OPT 11, OPT 12
a. Set up a procedure for office operations.	
b. Write up Rx orders according to Rx requirements and patients' needs.	
c. Demonstrate inventory control in the clinic.	
d. Prepare order forms.	
2. Demonstrate ophthalmic procedures.	OPT 1, OPT 2, OPT 3, OPT 5, OPT 11, OPT 12
a. Demonstrate frame adjustments to obtain recommended fit.	
b. Complete selected clinic assignments.	
c. Demonstrate communication skills.	

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 1	Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
OPT 2	Analyze and interpret prescriptions.
OPT 3	Communicate effectively with patient/customer.
OPT 5	Assist the patient/customer in selection of proper frames and lenses.
OPT 11	Maintain patient/customer records.
OPT 12	Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

R1	Interpret Graphic Information (forms, maps, reference sources)
R2	Words in Context (same and opposite meaning)
R3	Recall Information (details, sequence)
R4	Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
R5	Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
M1	Addition of Whole Numbers (no regrouping, regrouping)

- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
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Course Name: Dispensing Clinic II

Course Abbreviation: OPT 2623

Classification: Vocational–Technical Core

Description: This course is a continuation of Dispensing Clinic I. Continuous evaluations will be done to study the clinic operation in terms of its efficiency and effectiveness of operations. Additional adjustments and delivery will be done. Emphasis will be placed on developed cases of special Rx's and pediatric dispensing. Advanced projects, such as multifocal lens fitting, will be completed. (3 sch: 6-hr lab)

Pre/corequisites: Ophthalmic Dispensing III (OPT 2433) and Dispensing Clinic I (OPT 2613)

Competencies and Suggested Objectives	
1. Determine the best eyewear for the client based on occupation, sports, hobbies, and so forth.	OPT 1, OPT 2, OPT 3, OPT 5, OPT 6, OPT 8, OPT 11, OPT 12
a. Identify all FDA rules pertaining to eyeglasses.	
b. Select the appropriate lens for the client.	
c. Select the appropriate frame for the client.	
d. Develop case histories of special and pediatric prescriptions.	
2. Explain multifocal lens fitting techniques.	OPT 1, OPT 2, OPT 6, OPT 11
a. Identify different types of multifocal lens fitting techniques.	
b. Demonstrate fitting of multifocal lenses.	
c. Determine the pupillary distance and segment location.	
d. Identify different types of progressive lenses.	
e. Demonstrate fitting progressive lenses.	
3. Determine coating needed for lenses.	OPT 1, OPT 2, OPT 3, OPT 5, OPT 6, OPT 8, OPT 11, OPT 12
a. Apply Ultra Violet (UV) 400 coating.	
b. Apply scratch resistant coating.	
b. Apply tints.	
c. Discuss antireflective coating.	

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

OPT 1	Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
OPT 2	Analyze and interpret prescriptions.
OPT 3	Communicate effectively with patient/customer.
OPT 5	Assist the patient/customer in selection of proper frames and lenses.
OPT 6	Determine patient/customer physiognomic (facial and eye) measurements.
OPT 8	Adapt and fit corrective eyewear/vision aids.
OPT 11	Maintain patient/customer records.

OPT 12 Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
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- M8 Percents
- M9 Algebraic Operations
- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
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CS6 Interpersonal and Self-Directional Skills

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Course Name: Internship

Course Abbreviation: OPT 2916

Classification: Vocational–Technical Core

Description: This course will be conducted off-campus at a clinical location. The student will be under the direct supervision of the manager or clinical director. Evaluations will be completed by the instructor and off-campus clinical participants. (6 sch: 18-hr clinical)

Prerequisites: Successful completion of First Year Ophthalmic Technology courses

Competencies and Suggested Objectives	
1.	<p>Demonstrate mastery of selected skills in a clinical setting. <small>OPT 1, OPT 2, OPT 3, OPT 4, OPT 5, OPT 6, OPT 7, OPT 8, OPT 9, OPT 10, OPT 11, OPT 12, OPT 13, OPT 14</small></p> <ul style="list-style-type: none"> a. Perform basic mathematical and algebraic operations. b. Demonstrate knowledge of the human eye structure, function, and pathology. c. Neutralize eyewear prescriptions. d. Assist the client in selection of proper frames and lenses. e. Price and collect fees from clients for ophthalmic goods and services. f. Prepare ophthalmic laboratory job orders. g. Deliver prescription eyewear, and instruct client in use and care. h. Maintain patient records. i. Apply rules and regulations for safe work practices. j. Recognize the function of equipment. k. Utilize and maintain equipment. l. Demonstrate proficiency in finishing techniques. m. Assist in the business-related area of ophthalmic dispensing including record maintenance, frame and lens inventory, supply and equipment maintenance, and third-party forms. n. Complete one written report over specific job duties performed during internship.
2.	<p>Demonstrate communication skills. <small>OPT 1, OPT 2, OPT 3, OPT 4, OPT 5, OPT 6, OPT 7, OPT 8, OPT 9, OPT 10, OPT 11, OPT 12, OPT 13, OPT 14</small></p> <ul style="list-style-type: none"> a. Use effective oral and written communication. b. Assess vocational and avocational needs of the client. c. Provide follow-up service to the client, including periodic eyewear adjustment, repair, and lens and frame replacement. d. Respond to client complaints. e. Discuss prescription eyewear and other client-related information (verbal and written) with the refractionist.

STANDARDS

Standards Based on Essentials of an Accredited Program for Opticianry

- OPT 1 Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
- OPT 2 Analyze and interpret prescriptions.
- OPT 3 Communicate effectively with patient/customer.
- OPT 4 Identify the human eye structure, function, and pathology.
- OPT 5 Assist the patient/customer in selection of proper frames and lenses.
- OPT 6 Determine patient/customer physiognomic (facial and eye) measurements.
- OPT 7 Neutralize lenses, and verify eyewear/vision aids prescriptions.
- OPT 8 Adapt and fit corrective eyewear/vision aids.
- OPT 9 Apply rules and regulations for equipment safety
- OPT 10 Demonstrate proficiency in the operation and function of equipment.
- OPT 11 Maintain patient/customer records.
- OPT 12 Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.
- OPT 13 Dispense and fit contact lenses, where allowed by regulation.
- OPT 14 Dispense and fit artificial eyes and low vision aids, if appropriate.

Related Academic Standards

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)
- M1 Addition of Whole Numbers (no regrouping, regrouping)
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- M8 Percents
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- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)
- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
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Recommended Tools and Equipment

CAPITALIZED ITEMS

1. Surface layout markers (2 per program)
2. Surface layout blockers (2 per program)
3. Surface generator (1 per program)
4. Lens surfacers (4 spindle) (4 per program)
5. Alloy reclaim tanks (2 per program)
6. Lap racks (2 per program)
7. Air lens dryer (1 per program)
8. Surfacers saver tape dispenser (2 per program)
9. Lap blanks, assorted (500 per program)
10. Lensometer (10 per program)
11. Finish layout marker (2 per program)
12. Finish layout blocker (4 per program)
13. Patternless edger, computerized (1 per program)
14. Bevel edger (2 per program)
15. Hand edger (5 per program)
16. 6-Pot lens dye unit (1 per program)
17. Patternmaker (1 per program)
18. Lens grooving machine (2 per program)
19. Edge polisher (2 per program)
20. Display tables, 52 in. l x 18 in. w x 32 in. h (5 per program)
21. Frame bar, rectangular, holds 150 (2 per program)
22. Frame display, hex (2 per program)
23. Fitting tables (2 per program)
24. Frames, glasses, assorted (1,000 pairs per program)
25. Lens cabinet, holds 1,500 pair (1 per program)
26. Workbench (12 per program)
27. Computer (1 per 4 students)
28. Printer, laser (1 per 2 computers)
29. Computer workstation (1 per computer)
30. VCR/DVD player (1 per program)
31. Monitor, TV, 31 in. color (1 per program)
32. Book shelves, library-type (2 per program)

NON-CAPITALIZED ITEMS

1. Pattern racks (2 per program)
2. Frame warmers (glass beads) (2 per program)
3. Spectrometer (1 per program)
4. Gradient machine for dye units (2 per program)
5. Hand tools, assorted set (12 sets per program)
6. Lens holders for dye unit (10 per program)
7. Chairs, patient (2 per program)

8. Stools, optician (2 per program)
9. Frame warmers, hot air (2 per program)
10. Reception chairs (5 per program)
11. Axis pliers (4 per program)
12. Lens calipers (4 per program)
13. Ruler, in millimeter graduations (20 per program)
14. Screwdriver, optical (20 per program)
15. Lap gauge (1 per program)
16. Saggita gauge (1 per program)
17. Hand tools, mechanics set (1 set per program)
18. Stools, laboratory (12 per program)
19. Computer chair (1 per program)
20. File cabinets (2 per program)
21. Desk, student (20 per program)
22. Desk, teacher (1 per program)
23. Chair, teacher (1 per program)
24. Office desk and chair set (1 set per program)
25. Psychoschematic charts (Color blindness) (1 per program)
26. Snellen charts (visual acuity) (5 per program)
27. Corneal reflex pupilometers (2 per program)
28. Eye model (1 per program)
29. VCR/DVD player (1 per program)
30. Monitor, TV, 31 in. color (1 per program)
31. Book shelves, library-type (2 per program)

Assessment

Blueprint

This program is assessed using the Postsecondary Ophthalmic Technology MS-CPAS2 test. The following blueprint summary contains the competencies that are measured when assessing this program. Competencies are grouped into *clusters*, and a weight is given to each cluster to determine the number of items needed from each cluster. The numbers of C1s and C2s (item difficulty levels) are also indicated on the blueprint.

Please visit <http://info.rcu.msstate.edu/services/curriculum.asp> to download the [P] Ophthalmic Technology.

Appendix A: Standards Based on Essentials of an Accredited Program for Opticianry

Standards Based on Commission on Opticianry Accreditation, Essentials of an Accredited Program for Opticianry (2009)

DESCRIPTION OF THE PROFESSION

Upon completion of the program the optician should, at the minimum, be able to do the following:

- OPT 1 Discuss prescription eyewear/vision aids and other patient/customer related information, verbal and written, with the prescriber.
- OPT 2 Analyze and interpret prescriptions.
- OPT 3 Communicate effectively with patient/customer.
- OPT 4 Identify the human eye structure, function, and pathology.
- OPT 5 Assist the patient/customer in selection of proper frames and lenses.
- OPT 6 Determine patient/customer physiognomic (facial and eye) measurements.
- OPT 7 Neutralize lenses, and verify eyewear/vision aids prescriptions.
- OPT 8 Adapt and fit corrective eyewear/vision aids.
- OPT 9 Apply rules and regulations for equipment safety
- OPT 10 Demonstrate proficiency in the operation and function of equipment.
- OPT 11 Maintain patient/customer records.
- OPT 12 Assist in the business related areas, including record maintenance, frame and lens inventory, supply and equipment maintenance, and third party forms.
- OPT 13 Dispense and fit contact lenses, where allowed by regulation.
- OPT 14 Dispense and fit artificial eyes and low vision aids, if appropriate.

Appendix B: Related Academic Standards¹

Reading

- R1 Interpret Graphic Information (forms, maps, reference sources)
- R2 Words in Context (same and opposite meaning)
- R3 Recall Information (details, sequence)
- R4 Construct Meaning (main idea, summary/paraphrase, compare–contrast, cause–effect)
- R5 Evaluate/Extend Meaning (fact/opinion, predict outcomes, point of view)

Mathematics Computation

- M1 Addition of Whole Numbers (no regrouping, regrouping)
- M2 Subtraction of Whole Numbers (no regrouping, regrouping)
- M3 Multiplication of Whole Numbers (no regrouping, regrouping)
- M4 Division of Whole Numbers (no remainder, remainder)
- M5 Decimals (addition, subtraction, multiplication, division)
- M6 Fractions (addition, subtraction, multiplication, division)
- M7 Integers (addition, subtraction, multiplication, division)
- M8 Percents
- M9 Algebraic Operations

Applied Mathematics

- A1 Numeration (ordering, place value, scientific notation)
- A2 Number Theory (ratio, proportion)
- A3 Data Interpretation (graph, table, chart, diagram)
- A4 Pre-Algebra and Algebra (equations, inequality)
- A5 Measurement (money, time, temperature, length, area, volume)
- A6 Geometry (angles, Pythagorean theory)
- A7 Computation in Context (whole numbers, decimals, fractions, algebraic operations)
- A8 Estimation (rounding, estimation)

Language

- L1 Usage (pronoun, tense, subject–verb agreement, adjective, adverb)
- L2 Sentence Formation (fragments, run-on, clarity)
- L3 Paragraph Development (topic sentence, supporting sentence, sequence)
- L4 Capitalization (proper noun, titles)
- L5 Punctuation (comma, semicolon)
- L6 Writing Conventions (quotation marks, apostrophe, parts of a letter)

Spelling

- S1 Vowel (short, long)
- S2 Consonant (variant spelling, silent letter)
- S3 Structural Unit (root, suffix)

¹ CTB/McGraw-Hill LLC. (1994). *Tests of adult basic education, forms 7 and 8*. Monterey, CA: Author. Reproduced with permission of CTB/McGraw-Hill LLC. TABE is a registered trademark of The McGraw-Hill Companies, Inc. Copyright © 1994 by CTB/McGraw-Hill LLC. Reproduction of this material is permitted for educational purposes only.

Appendix C: 21st Century Skills²

CS1 Global Awareness

- Using 21st century skills to understand and address global issues
- Learning from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts
- Promoting the study of non-English language as a tool for understanding other nations and cultures

CS2 Financial, Economic, and Business Literacy

- Knowing how to make appropriate personal economic choices
- Understanding the role of the economy and the role of business in the economy
- Applying appropriate 21st century skills to function as a productive contributor within an organizational setting
- Integrating oneself within and adapting continually to our nation's evolving economic and business environment

CS3 Civic Literacy

- Being an informed citizen to participate effectively in government
- Exercising the rights and obligations of citizenship at local, state, national, and global levels
- Understanding the local and global implications of civic decisions
- Applying 21st century skills to make intelligent choices as a citizen

CS4 Information and Communication Skills

- Information and media literacy skills: Analyzing, accessing, managing, integrating, evaluating, and creating information in a variety of forms and media; understanding the role of media in society
- Communication skills: Understanding, managing, and creating effective oral, written, and multimedia communication in a variety of forms and contexts

CS5 Thinking and Problem-Solving Skills

- Critical thinking and systems thinking: Exercising sound reasoning in understanding and making complex choices, understanding the interconnections among systems
- Problem identification, formulation, and solution: Ability to frame, analyze, and solve problems
- Creativity and intellectual curiosity: Developing, implementing, and communicating new ideas to others, staying open and responsive to new and diverse perspectives

CS6 Interpersonal and Self-Directional Skills

- Interpersonal and collaborative skills: Demonstrating teamwork and leadership, adapting to varied roles and responsibilities, working productively with others, exercising empathy, respecting diverse perspectives
- Self-direction: Monitoring one's own understanding and learning needs, locating appropriate resources, transferring learning from one domain to another
- Accountability and adaptability: Exercising personal responsibility and flexibility in personal, workplace, and community contexts; setting and meeting high standards and goals for one's self and others; tolerating ambiguity

² *21st century skills*. (n.d.). Washington, DC: Partnership for 21st Century Skills.

- Social responsibility: Acting responsibly with the interests of the larger community in mind; demonstrating ethical behavior in personal, workplace, and community contexts