Digital Imaging and Design I

Curriculum Area: Applied Technology and Engineering (ATE)	Course Length: 1 Term
Course Titles: Digital Imaging and Design I	Date last reviewed: October 27, 2015
Prerequisites: None	Board approval date: June 16, 2015

Desired Results

Course Description / Purpose:
This course introduces students to the fundamentals of digital image creation, manipulation and publishing in a variety of formats. Digital images, whether photographic or design based, are the cornerstone of today's media rich environments This course focuses on developing an understanding of the interaction of the basic elements of photography and digital/graphic design exploring both raster and vector based images, the basis of all computer generated images today. Students will use a variety of software (Photoshop, Illustrator, InDesign) to create, edit and publish both raster and vector based graphics. A student fee is charged for the material used in this course.

Enduring Understanding:	**Essential Questions:**
The students will understand that… ● There are a multitude of career opportunities that utilize digital imaging skills. ● Digital imaging allows for multiple processes and solutions to a problem. ● Digital imaging uses elements of art and principles of design within their compositions. ● Digital image creation and publishing is a combination of input, image processing and output. ● Digital images are vector or raster based and need specific software to create each. ● Frequently, problems are too complex for a single person to solve. Teams are formed and duties shared. It is important to have a diversified team to	1. Why are composition, light, emotion and technical qualities important in the production of a quality photograph? 2. Why are vector based graphics required in the manufacture and production of machine produced graphics? 3. Why would raster (pixel) based graphics be utilized in image publication and transmission? 4. When should image size be a consideration and when should quality be sacrificed for speed? 5. How are color models (RGB or CMYK) applied when designing and publishing images? 6. How can design principles affect the readability and marketability of graphically designed projects? 7. When, ethically, can or should an image/photograph be altered and

help discover solutions that someone might miss. ● Knowing how to create, save, retrieve, and produce electronic work is essential in the work place. ● Graphic design is a language used to organize forms in order to communicate a message. ● Type can be one of the most powerful tools available for shaping the way an audience perceives written and electronic information. All digital designers need to have knowledge of typography since most products require type or lettering ● Photographs reflect a point of view, and can mislead as well as reveal.	manipulated with a image editing software? 8. What are the most important steps that should be applied to an image for publication whether it is going to be printed or displayed on the web?

Assessment Evidence:

Performance assessment: Project based assessments will be used in all units to assess student mastery. In addition other performance assessments will include portfolios, performance tests and journals.	Other assessments may include: ● oral presentations ● journals ● self & peer assessment tools ● (rubric/checklists rating scales) ● demonstrations ● paper-and-pencil tests ● laboratory reports ● portfolio analysis

UNITS
1. Introduction to Imaging 2. Photography 3. Graphic Design 4. Vector Image Creation and Editing 5. Raster Image Creation and Editing 6. Page Layout and Design 7. Image Output - Reproduction and Marketing

Unit 1: Introduction to Imaging

1. History and context of digital imaging
2. Digital imaging and its relationship to digital photography and illustration
3. Components: Input, image processing, output
4. Communication model and process

Wisconsin Standards for Technology and Engineering

ICT1: Students will analyze, select and use information and communication technologies.
ICT1.g: Analyze and use various technologies to produce graphic communication products.
ICT1.d: Analyze the principles of effective printed, projected and multimedia communication in a variety of formats and contexts.
ICT1.c: Analyze graphic communications in an ever increasingly technological world.
ICT1.b: Describe how communication is an ever evolving process.
ICT1.a: Analyze how communication happens, the different forms of communication and how it affects society.
MNF1: Students will be able to select and use manufacturing technologies.
MNF1.a: Identify, select and safely use tools, machines, products and systems for specific tasks
MNF1.a.1.e: Discuss health safety in the workplace.
MNF1.a.2.e: Recognize tools, machines and materials along with their applications and failures.
MNF1.a.3.e: Recognize the characteristics of length, volume, weight, area and time.
MNF1.a.4.m: Discuss health and safety procedures in the workplace that keep workers safe.
MNF1.a.9.h: Select and apply the appropriate units and scales for situations involving measurement.
MNF.1.b.2.e: Learn basic methods of verbal, written and graphical communication as it relates to manufacturing.
MNF.1.b.4.m: Comprehend and engage in communication methods to convey ideas, concepts and requirements to other individuals and teams

CCSS

CCSS.ELA-Literacy.SL.9-10.1
Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
CCSS.ELA-Literacy.SL.9-10.4
Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

Learning Targets Addressed:

I can:

- distinguish between input, image processing and output as it relates to a digital image.
- apply the parts of the communication process/model to properly create and design an image.
- use various input devices (cameras, scanners, etc.) to capture an image.
- manipulate and process an image using industry standard image processing software.
- work safely in the classroom work space.
- save, retrieve and properly store a digital file.

Unit 2: Photography

1. Composition
    a. Rule of thirds
    b. Balance - symmetry
    c. Framing
    d. Simplicity
    e. Leading lines/repetition
2. Lighting
    a. Ambient
    b. Artificial
    c. Creative
3. Technical
    a. Exposure Triangle
        i. Aperture
        ii. Shutter
        iii. ISO
    b. Equipment
        i. Lenses
        ii. Cameras
        iii. Flash
4. Emotion/Story/Moment

CCSS

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CCSS.ELA-Literacy.SL.9-10.4
Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

CCSS.ELA-LITERACY.RST.11-12.4
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
CCSS.ELA-LITERACY.RST.11-12.7
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
CCSS.ELA-LITERACY.RST.11-12.9
Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Wisconsin Standards for Technology and Engineering

ICT1: Students will analyze, select and use information and communication technologies.
ICT1.i: Analyze and use various technologies related to photographic media.
ICT1.g: Analyze and use various technologies to produce graphic communication products.
ICT1.d: Analyze the principles of effective printed, projected and multimedia communication in a variety of formats and contexts.
MNF.1.b.4.m: Comprehend and engage in communication methods to convey ideas, concepts and requirements to other individuals and teams

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Learning Targets:

I can:

- compose a quality photograph using basic composition methods.
- evaluate a photographic image on the basis of the story, composition, light and technical qualities.
- produce a body of work using photographic images and design skills.
- apply the basic principles of photography using camera controls to produce images.
- control a camera's shutter, aperture and ISO to produce a quality image.
- apply visual literacy for image analysis to the production of photographic images.

Unit 3: Graphic Design

1. Language of graphic design
    a. Unity/Variety
    b. Balance/Emphasis/Contrast
    c. Rhythm
    d. Repetition
    e. Proportion/Scale
    f. Color theory concepts and terminology
2. Color systems (RGB,CMYK,Pantone): applications
3. Two-dimensional imaging concepts of composition and aesthetics
4. Typography

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ICT1.d: Analyze the principles of effective printed, projected and multimedia communication in a variety of formats and contexts.
MNF1.a.9.h: Select and apply the appropriate units and scales for situations involving measurement.
MNF.1.b.4.m: Comprehend and engage in communication methods to convey ideas, concepts and requirements to other individuals and teams
ENG1.a.1.e: Design is a creative process.
ENG1.a.2.e: Everyone can design solutions to a problem.
ENG1.a.3.e: Discuss the design process is a purposeful method of planning practical solutions to problems.
ENG1.a.5.m: Design is a creative planning process that leads to useful products and systems.
ENG1.a.6.m: There is no perfect design.
ENG1.a.8.m: Requirements for a design are made up of criteria and constraints.
ENG1.a.11.h: Argue design processes vary slightly. However, key elements of any design process include: defining a problem, identifying criteria, generating solutions, creating a model or prototype, testing and evaluating, refining the design and communicating processes and results.

CCSS

CCSS.ELA-Literacy.W.9-10.6
Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
CCSS.ELA-Literacy.W-9-10.2d
Use precise language and domain-specific vocabulary to manage the complexity of a subject.
CCSS.ELA.Literacy. L.9-10.6

Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
CCSS.ELA-Literacy.SL.9-10.4
Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
CCSS.ELA-LITERACY.RST.11-12.4
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
CCSS.ELA-LITERACY.RST.11-12.7
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
CCSS.ELA-LITERACY.RST.11-12.9
Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Learning Targets:

I can:

- create a visual image incorporating graphics (art), photography and type.
- create a design to fulfill a need for a customer.
- apply a creative process (research, roughs, revise and finalize) to solve a graphic design problem.
- analyze a designed image using the language of graphic design.

Unit 4: Vector Image Creation and Editing

1. Software fundamentals: Adobe Illustrator
2. Digital drawing/illustration, image creation
3. File management/encoding

Wisconsin Standards for Technology and Engineering

ICT1: Students will analyze, select and use information and communication technologies.
ICT1.g: Analyze and use various technologies to produce graphic communication products.
MNF1.a.9.h: Select and apply the appropriate units and scales for situations involving measurement.

MNF.1.b.4.m: Comprehend and engage in communication methods to convey ideas, concepts and requirements to other individuals and teams
MNF.1.b.6.h: Design and publish documents using advanced publishing software and graphic programs to defend and promote results.
ENG1.a.5.m: Design is a creative planning process that leads to useful products and systems.
ICT1.d: Analyze the principles of effective printed, projected and multimedia communication in a variety of formats and contexts.

CCSS

CCSS.ELA-Literacy.SL.9-10.4
Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
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Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Learning Targets:

Adobe Illustrator Tasks (Tied to Adobe Certification Exam)

I can navigate the workspace of Adobe Illustrator.
Navigating the Workspace
- Customizing the workspace
- Using multiple artboards
- Utilizing rulers, grids, guides, and crop marks

I can draw and create a variety of vector based images both from scratch or manipulate existing graphics.
Drawing
- Drawing basics

- Creating shapes
- Drawing with the Pen tool
- Editing paths
- Tracing artwork with Live Trace
- Using Image Trace
- Working with symbols

I can change, adjust and create color palettes for application to digital images.

Working with Color

- Selecting color
- Using and creating swatches
- Using the Kuler panel

I can create basic painted shapes (raster based).

Painting

- Painting with fills and strokes

I can create and modify text/type to apply to graphic design.

Working with Type

- Creating type on a path
- Scaling and rotating type
- Working with fonts
- Formatting type
- Adjusting line and character spacing

I can apply basic special effects to vector based images.

Creating Special Effects

- Creating and applying drop shadows, glows, and feathering

Printing

- Setting up documents for printing
- Printing color separations
- Working with printer and bleed marks

Unit 5: Raster Image Creation and Editing
1. Software fundamentals: Adobe Photoshop Image creation 2. Digital image capture fundamentals a. scanning b. camera 3. File management/encoding 4. Image compositing/collage/montage
Wisconsin Standards for Technology and Engineering
ICT1: Students will analyze, select and use information and communication technologies. ICT1.g: Analyze and use various technologies to produce graphic communication products. ICT1.d: Analyze the principles of effective printed, projected and multimedia communication in a variety of formats and contexts.

MNF1.a.9.h: Select and apply the appropriate units and scales for situations involving measurement.
MNF.1.b.4.m: Comprehend and engage in communication methods to convey ideas, concepts and requirements to other individuals and teams
MNF1.f.2.e: Learn that manufactured products are designed.
ENG1.a.5.m: Design is a creative planning process that leads to useful products and systems.

CCSS

CCSS.ELA-Literacy.SL.11-12.4
Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
CCSS.ELA-Literacy.SL.9-10.4
Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
CCSS.ELA-LITERACY.RST.11-12.4
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
CCSS.ELA-LITERACY.RST.11-12.7
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
CCSS.ELA-LITERACY.RST.11-12.9
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Learning Targets:

Adobe Photoshop Tasks (Tied to Adobe CS6 Certification Exam)

I can navigate the workspace of Adobe Photoshop.
Understanding Photoshop Fundamentals
- Navigating the Photoshop workspace
- Using tool groups and options

I can create specific selections within Photoshop to control an image.
Understanding Selections
- Creating selections using appropriate tools
- Adding and subtracting from selections

• Quick Mask usage

I can manage and create layers to isolate image parts and use a non-destructive digital workflow.

Understanding Layers

- Creating and organizing layers
- Understanding the differences between raster and vector layers
- Understanding layer masks
- Understanding layer blend modes

I can adjust an image for color, brightness and contrast.

Understanding Adjustments

- Differentiating between adjustment types

I can edit a raster based image.

Editing Images

- Working with the retouching tools
- Working with Liquify
- Using the transform controls
- Using the Clone Source tool
- Creating speciality images (black and white and duotone)
- Selecting color

I can properly save a raster based image for web or print publication.

Outputting for Web, Print, and Mobile

- Differentiating between file types
- Using Save For Web
- Using the Print dialog

Unit 6: Page Layout and Design

1. Software fundamentals: Adobe InDesign Page Layout and Design
2. Print
3. Digital

Wisconsin Standards for Technology and Engineering

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ICT1.d: Analyze the principles of effective printed, projected and multimedia communication in a variety of formats and contexts.
MNF1.a.9.h: Select and apply the appropriate units and scales for situations involving measurement.
MNF.1.b.6.h: Design and publish documents using advanced publishing software and graphic programs to defend and promote results.
MNF.1.b.4.m: Comprehend and engage in communication methods to convey ideas, concepts and requirements to other individuals and teams

MNF1.e.7.h: Use marketing to establish a product's identity, conduct research on its potential, advertise it, distribute it and sell it.
MNF1.f.2.e: Learn that manufactured products are designed.
ENG1.a.1.e: Design is a creative process.
ENG1.a.5.m: Design is a creative planning process that leads to useful products and systems.
ENG1.a.6.m: There is no perfect design.

CCSS

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Learning Targets:

Adobe InDesign Tasks (Tied to Adobe Certification Exam)
I can create a page layout for a variety of documents sizes and output types.
Layout out a Document
- Creating a new document
- Navigating and viewing documents
- Constructing a flexible foundation for multi-page document
- Precisely position objects on a page
- Modify and transform objects
- Building documents for alternate layouts and print sizes

I can create and manipulate type within a layout.
Working with Text
- Create and position text in a frame and on a path
- Importing and editing text
- Applying formatting manually and automatically
- Inserting special characters

I can import, resize and manipulate a graphic within my document.
Managing Graphics

- Placing and altering graphics
- Working with linked files
- Adjusting graphic formatting and display

I can prepare my document for print/output.

Preparing Documents for Final Output

- Preflighting documents
- Exporting PDF for print output
- Printing documents

Unit 7: Output - Reproduction and Marketing

1. Vector Cutting
    a. Vinyl
    b. Laser-digital laser material processing technology
    c. CNC
2. Raster Output
    a. Inkjet
    b. Laser
3. Mass Reproduction
    a. Offset (other - RISO, Xerography)
    b. Screen
    c. Flexography
    d. Other
4. Digital Output
    a. Web
    b. Device
    c. Video
    d. Multimedia
    e. Game
5. Image Presentation
    a. Matting
    b. Mounting

WIsconsin Standards for Technology and Engineering

ICT1: Students will analyze, select and use information and communication technologies.
ICT1.j: Use various technologies to produce multimedia products and presentations.
ICT1.k: Analyze and use various technologies to produce printed products.

ICT1.f: Analyze, select various technologies, design and develop websites.
ICT1.g: Analyze and use various technologies to produce graphic communication products.
MNF1: Students will be able to select and use manufacturing technologies.

MNF1.a.9.h: Select and apply the appropriate units and scales for situations involving measurement.
MNF.1.b.4.m: Comprehend and engage in communication methods to convey ideas, concepts and requirements to other individuals and teams
MNF1.d.4.m: Identify the manufacturing process; including the designing, development, making and servicing of products and systems.
MNF1.e.1.e: Explore manufacturing systems that produce products in quantity.
MNF1.e.4.m: Define the purposes of marketing.
MNF1.e.7.h: Use marketing to establish a product's identity, conduct research on its potential, advertise it, distribute it and sell it.
MNF1.f.2.e: Learn that manufactured products are designed.

CCSS

CCSS.ELA-Literacy.SL.9-10.4
Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
CCSS.ELA-LITERACY.RST.11-12.4
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
CCSS.ELA-LITERACY.RST.11-12.7
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
CCSS.ELA-LITERACY.RST.11-12.9
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Learning Targets:

I can...

- apply vector based graphics that I have created to control an output device in order to create a finished product (i.e. vinyl cutter, laser cutter, cnc router, etc.).
- output a printed raster based graphic to a variety of output devices including inkjet, laser, etc.
- apply an RGB color model to output and explain how it is converted to a CMYK document.
- articulate how a designed product would be reproduced by a major printing process including gravure, offset, flexographic or digital means.

- prepare any of my graphics to be output properly whether that be multimedia, web, print or other means.
- prepare an image for presentation purposes.