

EM Image Processing 1

Course Outcome Summary

Course Information

Organization	Madison Area Technical College
Developers	Jennifer Kostrna
Development Date	6/15/2007
Course Number	10-636-113
Instructional Level	Associate Degree
Potential Hours of Instruction	54
Total Credits	2

Description

Introduces the theory and application of digital image acquisition from light and electron microscopes. Using PhotoShop, students learn to import images into a PC for incorporation into scientific documents. Using basic digital imaging concepts students concentrate on composition, brightness and contrast, focus, bit depth and enhancement. Student explores basic digital imaging terminology, issues of the relationships between input resolution and final output resolution for print, screen and web application; file organization, nomenclature, formatting and compression, and archiving of digital images.

Target Population

Electron Microscopy Program students

Types of Instruction

Instruction Type	Contact Hours	Credits
Classroom Presentation	18	2
On-Campus Lab	36	

Learner Supplies

Computer storage device.

2" Binder.

1" Binder.

Exit Learning Outcomes

Core Abilities

- A. Ethics
- B. Science and Technology

Program Outcomes

- A. Develop work habits such as timeliness, attendance, interpersonal skills, and communication skills consistent with employment requirements.
- B. Develop work habits such as timeliness, attendance, interpersonal skills, and

communication skills consistent with employment requirements

Competencies

A. Differentiate between analog and digital images

Linked Core Abilities

Science and Technology

You will demonstrate competence:

- A.1. by entering into classroom discussions
- A.2. by participating in classroom activities
- A.3. on a quiz
- A.4. by taking an exam

Your performance will be successful when:

- A.1. you participate in classroom discussion
- A.2. you participate in classroom activities
- A.3. quiz includes answers to questions from the lecture
- A.4. quiz has all answers completed
- A.5. quiz has all answers corrected
- A.6. exam includes the definition of analog images
- A.7. exam includes the definition of digital images
- A.8. exam includes the characteristics of analog images
- A.9. exam includes the characteristics of digital images
- A.10. exam includes comparing and contrasting digital and analog images
- A.11. exam includes process of creating analog images
- A.12. exam includes process of creating digital images
- A.13. exam includes definitions of analog terminology
- A.14. exam includes definitions of digital terminology

B. Manipulate EM images

Linked Core Abilities

Ethics

Science and Technology

You will demonstrate your competence:

- B.1. by entering into classroom discussions
- B.2. by participating in classroom activities
- B.3. on a quiz
- B.4. by taking an exam
- B.5. by submitting manipulated images

Your performance will be successful when:

- B.1. you participate in classroom activities
- B.2. quiz includes answers to questions from the lecture
- B.3. quiz has all answers completed
- B.4. quiz has all answers corrected
- B.5. exam includes exam includes theory of manipulating images
- B.6. exam includes the definition of image brightness
- B.7. exam includes the definition of image contrast

- B.8. exam includes scientific terminology
- B.9. exam includes digital imaging terminology
- B.10. exam includes characteristics of good images
- B.11. exam includes digital image terminology
- B.12. manipulated images include proper contrast using Brightness/Contrast tool
- B.13. manipulated images include proper contrast using Levels tool
- B.14. manipulated images include proper contrast using Curves tool
- B.15. manipulated images include proper contrast using a variety of Adjustment tools
- B.16. manipulated images include AOI
- B.17. manipulated images include text

C. Output EM images

Linked Core Abilities

Ethics

Science and Technology

You will demonstrate your competence:

- C.1. by entering into classroom discussions
- C.2. by participating in classroom activities
- C.3. by turning in images
- C.4. on a quiz
- C.5. on an exam

Your performance will be successful when:

- C.1. you participate in classroom discussion
- C.2. you participate in classroom activities
- C.3. you identify various paper applications
- C.4. quiz includes answers to questions from the lecture
- C.5. quiz has all answers completed
- C.6. quiz has all answers corrected
- C.7. exam includes differentiating paper qualities
- C.8. exam includes digital imaging terminology
- C.9. exam includes scientific terminology
- C.10. images include appropriate resolution for various applications
- C.11. images are printed on various papers
- C.12. exam includes manipulated image
- C.13. printed images include good contrast
- C.14. printed images include good brightness
- C.15. printed images are well composed
- C.16. printed images include area of interest
- C.17. printed images include proper resolution
- C.18. printed images are printed on appropriate papers
- C.19. printed images include proper file extension
- C.20. display images include proper resolution
- C.21. display images include proper file extension

D. Create image archives

Linked Core Abilities

Science and Technology

You will demonstrate your competence:

- D.1. by participating in classroom activities
- D.2. by turning in an image file binder
- D.3. by turning in a microscope log book
- D.4. on a quiz
- D.5. on an exam

Your performance will be successful when:

- D.1. you participate in classroom discussion
- D.2. you participate in classroom activities
- D.3. image file binder includes labelled file dividers
- D.4. image file binder is organized by virtual file system
- D.5. image file binder includes titled contact sheets of each virtual file folder
- D.6. image file binder includes files with standard naming protocol
- D.7. image file binder includes images saved with proper file extensions
- D.8. image file binder includes labelled CD of images
- D.9. microscope log book includes microscope image information
- D.10. quiz includes answers to questions from the lecture
- D.11. quiz has all answers completed
- D.12. quiz has all answers corrected
- D.13. exam includes relabelled images
- D.14. exam includes identification of file extensions
- D.15. exam includes identification of compression schemes
- D.16. exam includes proper uses of file extensions
- D.17. exam includes proper uses of compression schemes
- D.18. exam includes scientific terminology
- D.19. exam includes digital imaging terminology

E. Generate scientific lab report

Linked Core Abilities

Science and Technology

You will demonstrate your competence:

- E.1. by entering into classroom discussions
- E.2. by participating in classroom activities
- E.3. on a quiz
- E.4. on an exam
- E.5. by turning in scientific lab report

Your performance will be successful when:

- E.1. you participate in classroom discussion
- E.2. you participate in classroom activities
- E.3. quiz includes answers to questions from the lecture
- E.4. quiz has all answers completed
- E.5. quiz has all answers corrected
- E.6. exam includes application of report formatting rules
- E.7. report includes purpose of the lab introduction

- E.8. report includes a list of materials used
- E.9. report includes Procedures
- E.10. report includes Conclusion
- E.11. report includes images
- E.12. report is free of grammatical and punctuation errors
- E.13. report is written in the third person