

# Graphic Arts and Imaging Technology

The Graphics Arts and Imaging Technology curriculum is designed to provide students with knowledge and skills necessary for employment in the printing, publishing, packaging and related industries.

Students receive hands-on training in computer publishing, imaging technology, offset lithography, screen printing, flexography and emerging printing technologies.

Graduates should qualify for career opportunities within the printing, publishing and packaging industries.

For specific information about potential positions and wages in Graphic Arts and Imaging employment, visit the Central Piedmont Career Coach (<https://cpcc.emsicc.com/programs/graphic-arts-and-imaging-technology-academic-program-for-credit/198260?radius=&region=50%20Mile%20Radius>) website.

## Graphic Arts and Imaging Technology (A30180)

### Degree Awarded

The Associate in Applied Science degree-Graphic Arts and Imaging Technology is awarded by the college upon completion of this program.

### Admissions

- A high school diploma or equivalent is required.
- Submit high school transcripts and any college transcripts.
- Placement testing in English, mathematics and reading is required to qualify for ENG 111 and college-level math. Scores on placement tests may require students to take specified Developmental Studies courses. If required, completion of these courses is necessary prior to program admission. Students may, with approval of the program chair, take no more than two pre-admission courses during their first semester of program admission.
- Students must demonstrate proficiency in computer operation equivalent to or higher than CIS 110 before admission.
- Many courses have prerequisites or co-requisites; check the Courses section for details.

### Notes

Students must furnish required hand tools for the program. A list of these items can be obtained from the program chair or instructors.

### Contact Information

The Graphic Arts and Imaging Technology program is in the Technical Careers Division. For more information, call the program office at 704.330.4425 or contact the program chair at 704.330.4427. For suggested course sequence, contact Graphic Arts and Imaging Technology instructors or program counselors through the program office.

### General Education Requirements

ENG 111	Writing and Inquiry	3.0
COM 110	Introduction to Communication	3.0
or COM 231	Public Speaking	

Take 3 credits from the following:		3.0
ENG 112	Writing and Research in the Disciplines	
ENG 113	Literature-Based Research	
ENG 114	Professional Research & Reporting	

Take 1 course from the following:		3.0
MAT 110	Mathematical Measurement and Literacy	
MAT 143	Quantitative Literacy	

Select 3 credits of the following:		3.0
ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	

Select 3 credits of the following:		3.0
ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	

### Major Requirements

GRA 121	Graphic Arts I	4.0
GRA 221	Graphic Arts II	4.0
GRA 151	Computer Graphics I	2.0
GRA 152	Computer Graphics II	2.0
GRA 153	Computer Graphics III	2.0
GRA 255	Image Manipulation I	2.0
GRA 256	Image Manipulation II	2.0
GRD 141	Graphic Design I	4.0
PRN 155	Screen Printing I	2.0
PRN 131	Flexography I	4.0
WBL 111	Work-Based Learning I	1.0

### Technical Electives

Select 20 credits from the following:		20.0
ACA 111	College Student Success	
GRA 222	Graphic Arts III	
GRA 154	Computer Graphics IV	
GRA 140	Graphic Arts Imaging	
GRA 110	Graphic Arts Orientation	
PRN 156	Screen Printing II	
WBL 112	Work-Based Learning I	
PRN 171	Introduction to Brand Protection and Anti-Counterfeiting Technology	

PRN 271	Graphic Imaging for Brand Protection and Anti-Counterfeiting Technology
PRN 272	Brand Protection and Anti-Counterfeiting Technology Implementation
WBL 122	Work-Based Learning II
BUS 110	Introduction to Business
BUS 139	Entrepreneurship I
MKT 120	Principles of Marketing
CIS 110	Introduction to Computers
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Total Credits	67

## Graphic Arts and Imaging Technology Flexography Concentration (A3018A)

Flexography is a concentration under the Graphic Arts and Imaging Technology curriculum. This curriculum is designed to allow students to gain further study into the flexographic printing production process.

Students produce jobs for labels, tags, boards, packaging and corrugated jobs found in segments of the flexographic industry. Students concentrate on color reproduction and produce products while understanding the limitations within the production process.

Graduates should qualify for career opportunities within the printing, publishing and packaging industries.

### Degree Awarded

The Associate in Applied Science-Graphic and Imaging Technology/ Flexography degree is awarded by the college upon completion of this program.

### Admissions

- A high school diploma or equivalent is required.
- Submit high school transcripts and any college transcripts.
- Placement testing in English, mathematics and reading is required to qualify for ENG 111 and college-level math. Scores on placement tests may require students to take specified Developmental Studies courses. If required, completion of these courses is necessary prior to program admission. Students may, with approval of the program chair, take no more than two pre-admission courses during their first semester of program admission.
- Students must demonstrate proficiency in computer operations equivalent to or higher than CIS 110 before admission.
- Many courses have prerequisites or co-requisites; check the Courses section for details.

### Notes

Students must furnish required hand tools for program. A list of these items can be obtained from the program chair or instructors.

### Contact Information

Graphic and Imaging Technology Flexography is in the Technical Careers Division. For more information, call 704.330.4425 or 704.330.4427. See Graphic Arts and Imaging Technology Program instructors or program counselors for suggested sequence of courses.

#### General Education Requirements

ENG 111	Writing and Inquiry	3.0
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Select one of the following:		3.0
ENG 112	Writing and Research in the Disciplines	
ENG 113	Literature-Based Research	
ENG 114	Professional Research & Reporting	

Select one of the following:		3.0
MAT 110	Mathematical Measurement and Literacy	
MAT 143	Quantitative Literacy	

Select one of the following:		3.0
COM 110	Introduction to Communication	
COM 231	Public Speaking	

Select 3 credits of the following:		3.0
ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	

Select 3 credits of the following:		3.0
ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	

#### Major Requirements

GRA 121	Graphic Arts I	4.0
GRA 221	Graphic Arts II	4.0
GRA 151	Computer Graphics I	2.0
GRA 152	Computer Graphics II	2.0
GRA 153	Computer Graphics III	2.0
GRA 255	Image Manipulation I	2.0
GRA 256	Image Manipulation II	2.0
GRD 141	Graphic Design I	4.0
PRN 131	Flexography I	4.0
PRN 132	Flexography II	4.0
PRN 231	Flexography III	4.0
PRN 232	Flexography IV	4.0
PRN 241	Flexo Applications I	4.0
PRN 242	Flexo Applications II	4.0
WBL 111	Work-Based Learning I	1.0

#### Technical Electives

Select 8.0 credits from the following:		8.0
PRN 155	Screen Printing I	
GRA 110	Graphic Arts Orientation	
GRA 140	Graphic Arts Imaging	

PRN 156	Screen Printing II	
GRA 222	Graphic Arts III	
PRN 171	Introduction to Brand Protection and Anti-Counterfeiting Technology	
PRN 271	Graphic Imaging for Brand Protection and Anti-Counterfeiting Technology	
PRN 272	Brand Protection and Anti-Counterfeiting Technology Implementation	
GRA 154	Computer Graphics IV	
BUS 110	Introduction to Business	
WBL 112	Work-Based Learning I	
WBL 122	Work-Based Learning II	
BUS 139	Entrepreneurship I	
MKT 120	Principles of Marketing	
CIS 110	Introduction to Computers	
Total Credits		73

## No diplomas are offered in Graphics Arts and Imaging Technology.

### Graphic Arts and Imaging Technology Certificates (C30180)

- Graphic Arts and Imaging Technology Certificate Specialization in Screen Printing Company Ownership (C30180-14) (p. 3)
- Graphic Arts and Imaging Technology Certificate Specialization in Brand Protection and Anti-Counterfeiting Technology (C30180-20) (p. 3)

#### Graphic Arts and Imaging Technology Certificate Specialization in Screen Printing Company Ownership (C30180-14)

##### Major Requirements:

PRN 156	Screen Printing II	2.0
GRA 153	Computer Graphics III	2.0
GRA 255	Image Manipulation I	2.0
BUS 139	Entrepreneurship I	3.0
GRA 221	Graphic Arts II	4.0
Total Credits		13

#### Graphic Arts and Imaging Technology Certificate Specialization in Brand Protection and Anti-Counterfeiting Technology (C30180-20)

##### Major Requirements

GRA 121	Graphic Arts I	4.0
PRN 131	Flexography I	4.0
PRN 171	Introduction to Brand Protection and Anti-Counterfeiting Technology	2.0
PRN 271	Graphic Imaging for Brand Protection and Anti-Counterfeiting Technology	2.0
PRN 272	Brand Protection and Anti-Counterfeiting Technology Implementation	3.0
Total Credits		15

This certificate program is designed to educate individuals looking to enter into the security printing industry. This program will include important topics geared toward understanding how counterfeiting is impacting world trade and what technologies are in place to deter brand infringement. Students will learn the many ways a brand can be impacted by criminals. They will gain the skills required to develop and implement a plan of protection for a brand. Students who complete this certificate will understand the legal aspects and scope of counterfeiting, be knowledgeable in the technologies designed to combat counterfeiting, and be able to develop a plan of protection for a brand to reduce infringement to their intellectual property.

**GRA 110. Graphic Arts Orientation. 2.0 Credits.** Class-2.0. Clinical-0.0. Lab-0.0. Work-0.0

This course covers the history, development, and commercial applications of the major printing processes. Topics include offset lithography, screen printing, intaglio, relief printing, and emerging technologies. Upon completion, students should be able to demonstrate an understanding of the major characteristics, advantages, and disadvantages of each process.

**GRA 121. Graphic Arts I. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course introduces terminology, tools and materials, procedures, and equipment used in graphic arts production. Topics include copy preparation and pre-press production relative to printing. Upon completion, students should be able to demonstrate an understanding of graphic arts production.

**GRA 140. Graphic Arts Imaging. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-2.0. Work-0.0

This course covers the use of photographic and electronic imaging techniques in the printing industry. Topics include exposure control and manipulation for a variety of process photography procedures and emerging electronic imaging techniques. Upon completion, students should be able to create line, special effect, and halftone images by both conventional and computer imaging methods.

**GRA 151. Computer Graphics I. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course introduces the use of hardware and software for production and design in graphic arts. Topics include graphical user interface and current industry uses such as design, layout, typography, illustration, and imaging for production. Upon completion, students should be able to understand and use the computer as a fundamental design and production tool.

**GRA 152. Computer Graphics II. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course covers advanced design and layout concepts utilizing illustration, page layout, and imaging software in graphic arts. Emphasis is placed on enhancing and developing the skills that were introduced in GRA 151. Upon completion, students should be able to select and utilize appropriate software for design and layout solutions.  
Prerequisites: Take GRA 151

**GRA 153. Computer Graphics III. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course is a continuation of GRA 152. Emphasis is placed on advanced computer graphics hardware and software applications. Upon completion, students should be able to demonstrate competence in selection and utilization of appropriate software for specialized applications.  
Prerequisites: Take GRA 152

**GRA 154. Computer Graphics IV. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course is a continuation of GRA 153. Emphasis is placed on advanced techniques using a variety of hardware and software applications to produce complex projects. Upon completion, students should be able to use electronic document production tools.

Prerequisites: Take GRA 153

**GRA 161. Computer Graphics Applications I. 1.0 Credit.** Class-0.0. Clinical-0.0. Lab-3.0. Work-0.0

This course is designed to provide additional hands-on training using computer software and hardware for production and design in graphic arts. Emphasis is placed on utilizing various computer software and hardware to produce simple graphic arts projects. Upon completion, students should be able to use the computer as a graphic arts production tool.

Corequisites: Take GRA 151

**GRA 162. Computer Graphics Applications II. 1.0 Credit.** Class-0.0. Clinical-0.0. Lab-3.0. Work-0.0

This course is designed to provide additional hands-on training using computer software and hardware for production and design in graphic arts. Emphasis is placed on utilizing various computer software and hardware to produce intermediate graphic arts projects. Upon completion, students should be able to effectively use the computer as a graphic arts production tool.

Corequisites: Take GRA 152

**GRA 163. Computer Graphics Applications III. 1.0 Credit.** Class-0.0. Clinical-0.0. Lab-3.0. Work-0.0

This course is designed to provide additional hands-on training using computer software and hardware for production and design in graphic arts. Emphasis is placed on utilizing various computer software and hardware to produce advanced graphic arts projects. Upon completion, students should be able to effectively use the computer as a graphic arts production tool.

Corequisites: Take GRA 153

**GRA 164. Computer Graphics Applications IV. 1.0 Credit.** Class-0.0. Clinical-0.0. Lab-3.0. Work-0.0

This course is designed to provide additional hands-on training using computer software and hardware for production and design in graphic arts. Emphasis is placed on utilizing various computer software and hardware to produce professional quality graphic arts projects. Upon completion, students should be able to effectively and efficiently use the computer as a graphic arts production tool.

Corequisites: Take GRA 154

**GRA 221. Graphic Arts II. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course is a continuation of GRA 121. Topics include multi-color image preparation, pre-press production, control of close/hairline register in image assembly and press operation, and post-press procedures. Upon completion, students should be able to demonstrate competence in all phases of graphic arts production.

Prerequisites: Take All: GRA 121 and GRA 151

**GRA 222. Graphic Arts III. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course is a continuation of GRA 221. Topics include advanced electronic pre-press, press operation, and post-press procedures. Upon completion, students should be able to demonstrate competence in all phases of advanced graphic arts production.

Prerequisites: Take All: GRA 221 and GRA 152

**GRA 230. Substrates & Ink. 2.0 Credits.** Class-2.0. Clinical-0.0. Lab-0.0. Work-0.0

This course covers the manufacture, purchase, and use of printing substrates and inks in the graphic arts industry. Topics include the history, development, testing, purchasing, and use of ink, paper, and specialty substrates used in printing, as well as problems associated with each. Upon completion, students should be able to demonstrate an understanding of ink and substrate relationships in the design, planning, purchase, and production of a printed job.

**GRA 245. Printing Sales/Service. 3.0 Credits.** Class-3.0. Clinical-0.0. Lab-0.0. Work-0.0

This course covers the operation of a sales, marketing, and service program for a printing company or printing supplier. Topics include marketing, prospecting, telephone sales, customer service, order entry, closing the sale, and answering objections. Upon completion, students should be able to understand the operation of sales and service in printing and printing supply organizations.

**GRA 252. Imaging Techniques. 3.0 Credits.** Class-1.0. Clinical-0.0. Lab-4.0. Work-0.0

This course covers electronic imaging and transfer and display of digital images through various media. Topics include analysis of electronic imaging, including uses, medium, outcome, storage, and display hardware and software. Upon completion, students should be able to demonstrate an understanding of electronic imaging techniques and purposes and complete related assignments.

Prerequisites: Take One: GRA 151 or GRD 151

**GRA 255. Image Manipulation I. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course covers applications associated with electronic image manipulation, including color correction, color separation, special effects, and image conversion. Topics include image-capturing hardware, image-processing software, and output options. Upon completion, students should be able to utilize hardware and software to acquire, manipulate, and output images to satisfy design and production.

Prerequisites: Take One: GRA 151 or GRD 151

**GRA 256. Image Manipulation II. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course covers electronic color separation and its relationship to multi-color printing. Topics include color theory, separation, color matching, proofing, and output of process and spot color images. Upon completion, students should be able to use hardware and image processing software to produce color separations and proofs for various printing processes.

Prerequisites: Take GRA 255

**PRN 131. Flexography I. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course provides basic hands-on instruction in flexographic image preparation, platemaking, mounting, and printing. Emphasis is placed on taking press measurements, making and mounting plates, and obtaining quality in press operation on a narrow-web press. Upon completion, students should be able to describe and perform flexographic production procedures in pre-press, press setup, press operation, and die-cutting.

**PRN 132. Flexography II. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course is a continuation of PRN 131 and introduces wide-web presses. Emphasis is placed on troubleshooting press problems, color matching, parts identification, make-ready, and setup of narrow-web, wide-web, or corrugated presses. Upon completion, students should be able to produce advanced projects involving all flexographic production phases. This course is a unique concentration requirement in the Flexography concentration in the Graphic Arts and Imaging Technology program.  
Prerequisites: Take PRN 131

**PRN 155. Screen Printing I. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course covers screen printing techniques and materials. Topics include methods, materials, design, and image and stencil preparation techniques. Upon completion, students should be able to produce single- or multi-color projects.

**PRN 156. Screen Printing II. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-3.0. Work-0.0

This course is a continuation of PRN 155. Emphasis is placed on advanced techniques and current industry practices. Upon completion, students should be able to produce multi-color projects utilizing various photographic stencil methods and substrates.  
Prerequisites: Take PRN 155

**PRN 171. Introduction to Brand Protection and Anti-Counterfeiting Technology. 2.0 Credits.** Class-2.0. Clinical-0.0. Lab-0.0. Work-0.0

This course is designed to address the fundamental aspects of the problem of counterfeiting in the modern printing and packaging industry. Topics include current levels of security, global impact of counterfeiting, identification of counterfeit materials, how products are attacked, technology solutions available for infringement reduction, introducing brand protection to clients, and industry standards related to security printing. Upon completion, students should be able to: identify areas of security risk related to a brand, be able to develop a plan to help protect a brand from infringement, describe available technologies to combat infringement, and reference the standards related to security printing.

**PRN 221. Offset Press Operations. 3.0 Credits.** Class-1.0. Clinical-0.0. Lab-4.0. Work-0.0

This course covers advanced lithographic theory and provides extensive hands-on operating experience. Emphasis is placed on make-ready, press operation, maintenance, and troubleshooting of multi-color jobs on sheet-fed offset presses and duplicators. Upon completion, students should be able to set up, run, maintain, and produce commercial-quality multi-color work.

**PRN 231. Flexography III. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course is a continuation of PRN 132. Emphasis is placed on the products made and processes used in the industry. Upon completion, students should be able to demonstrate an understanding of advanced production techniques of flexographic products. This course is a unique concentration requirement in the Flexography concentration in the Graphic Arts and Imaging Technology program.  
Prerequisites: Take PRN 132

**PRN 232. Flexography IV. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course provides opportunities for advanced and specialized study in flexography. Emphasis is placed on specialized product design and production. Upon completion, students should be able to demonstrate an understanding of the comprehensive scope of the flexographic industry, products, and processes. This course is a unique concentration requirement in the Flexography concentration in the Graphic Arts and Imaging Technology program.  
Prerequisites: Take PRN 231

**PRN 240. Print Estimating/Planning. 3.0 Credits.** Class-3.0. Clinical-0.0. Lab-0.0. Work-0.0

This course covers printing economics, development of cost centers, job flow throughout departments, and material and labor costs. Topics include budgeted, hourly, cost-rate derivation; production standards and data; and analysis of other estimating procedures including computer-assisted estimating. Upon completion, students should be able to demonstrate an understanding of economic factors of the printing industry and determine all production costs of printed jobs. This course is a unique concentration requirement in the Flexography concentration in the Graphic Arts and Imaging Technology program.  
Prerequisites: Take GRA 121

**PRN 241. Flexo Applications I. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course provides an opportunity to specialize in certain applications in flexographic printing. Emphasis is placed on understanding color and production concerns in order to produce products. Upon completion, students should be able to troubleshoot color problems during printing and relate them to the production procedures. This course is a unique concentration requirement in the Flexography concentration in the Graphic Arts and Imaging Technology program.  
Prerequisites: Take All: GRA 152 and PRN 131

**PRN 242. Flexo Applications II. 4.0 Credits.** Class-2.0. Clinical-0.0. Lab-4.0. Work-0.0

This course provides an opportunity to produce comprehensive projects, including color work on special substrates using specialty inks. Emphasis is placed on compensation for press limitations to produce high-quality color products. Upon completion, students should be able to produce color images on a variety of substrates and troubleshoot and solve production problems. This course is a unique concentration requirement in the Flexography concentration in the Graphic Arts and Imaging Technology program.  
Prerequisites: Take All: PRN 241, GRA 153, and GRA 255

**PRN 271. Graphic Imaging for Brand Protection and Anti-Counterfeiting Technology. 2.0 Credits.** Class-1.0. Clinical-0.0. Lab-2.0. Work-0.0

This course is designed to address the utilization of specialized software to develop secure packaging and documents that are used in the protection of trademarks and branding. Topics include the utilization of software to develop secure elements to be incorporated in packaging and documentations, development of a plan utilizing overt and covert security elements to prevent duplication, and creation of layouts for various packaging and documentation related to the security printing industry. Upon completion, students should be able to use software to develop secure elements to be utilized in packaging and documentation, create a strategy for a brand that is designed to prevent counterfeiting, create and design various packaging and documentation in relationship to the security printing industry and reference the industry standards as they pertain to pre-press for security printing.  
Prerequisites: Take All: GRA 121, PRN 131 and PRN 171

**PRN 272. Brand Protection and Anti-Counterfeiting Technology**

**Implementation. 3.0 Credits.** Class-1.0. Clinical-0.0. Lab-4.0. Work-0.0

This course is designed to provide students with the knowledge needed to work within a secure facility and produce products that have built in security technology designed to prevent brand infringement. Topics include the handling, transporting, storing, and tracking secure materials, testing print device's limitations to accurately produce secure products, operating a printing device to produce products with security technology built into the product, and understanding the culture of security printing. Upon completion, students should be able to demonstrate appropriate demeanor for a secure facility, track and maintain all secure print materials, operate multiple printing devices to the quality standards of the secure print industry, and be able to produce printed products with security technology built into the product.

Prerequisites: Take All: GRA 121, PRN 131, and PRN 171