spective look at landscape design personalities through the ages and their influence upon the American landscape. *Spring*

HORT359 $ Alt (3)
Greenhouse Environment and Construction
Controlling the plant environment to enhance plant growth and optimal development through temperature, humidity, light, nutrients, sanitation and carbon dioxide levels. Structures, coverings and mechanical systems used are explored to produce the most cost-effective horticultural crops. Weekly: 2 hours lecture and a 3-hour lab. *Fall*

HORT360 $ Alt (3)
Arboriculture
Care of shade and ornamental trees living under environmental stress of urbanization, their legal protection and value. Includes tree anatomy and physiology, soils, nutrition and water relationships, transplanting, disease and insect control, mechanical injury and pruning to develop a healthy tree. Weekly: 2 lectures and a 3-hour lab. *Fall*

HORT365 $ Alt (3)
Urban Landscape Design
Designing landscapes to meet the environmental challenges and conditions of urban spaces. Circulation patterns for conducting business, aesthetic and functional aspects of design for corporate/institutional, governmental agencies and municipal areas. Weekly: 2 lectures and a 3-hour lab. Recommended: HORT135. *Spring*

HORT375 Alt (3)
Landscape Estimating
An introduction to the estimating process for landscape design, construction and maintenance work. Various schedules and forms are used to assign costs of equipment, plants, hardscape materials, labor and overhead. The many variables from project to project are explored and then formulas are applied to arrive at making landscape installations an efficient and profitable business. *Spring*

HORT378 Alt (4)
Integrated Pest/Disease Management
Study of significant diseases and pests of agricultural and horticultural plant materials, including life cycles and influence of environmental conditions; determination of effective control methods for crop, ornamental and turfgrass production. *Spring*

HORT429 $ Alt (3)
Computer Landscape Design
Principles and practices of computer-aided landscape design, including creating scale perimeter plot plans, using drawing tools, plant/site relationships, and graphic imaging leading to a computer-generated landscape drawing. Laboratory emphasizes skill development and proficiency in integrating software and hardware to create CAD-generated landscape designs. Prior landscape drawing course work is recommended. *Spring*

HORT448 $ Alt (4)
Advanced Landscape Design and Graphics
Landscape design concepts relating to the more challenging problems of residential design. Field application of grading relating to contours, specifications, exploring deck design, planting combinations, and exercises in graphics and rendering for presentations. Weekly: 3 lectures and a 3-hour lab. Recommended: HORT135. *Spring*

DIGITAL MEDIA AND PHOTOGRAPHY

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Academic Programs	Credits
Bachelor of Fine Arts:	
Multimedia Arts	72–75
Photography (Commercial or Fine Art)	72–75
Video Production	72–75
Web Design	72–75
Associate of Fine Arts: Digital Media	38–40
Minors	
Digital Media	20
Photography	20
Other BFA Options at Andrews University	
Art Direction/Advertising	
Pre-Art Therapy	
Fine Art	
Graphic Design	

Programs

By the end of the sophomore year students need to complete 16 hours in their respective major. They must also submit a portfolio of their work to the department, along with a formal application to the program they are pursuing. The review is a time when faculty evaluate student progress by examining the technical and creative abilities. Students must present their portfolios to the faculty, discuss goals, and intelligently defend their work.

Applications and portfolios are reviewed by the department during the month of May, and applicants are notified no later than June 30 of acceptance into the program. For graduation students must have a cumulative GPA of 2.75 in their major.

Bachelor of Fine Arts—-72-75

The three closely related departments of Art & Design, Communication, and Digital Media & Photography offer students an exciting opportunity to earn a collaborative Bachelor of Fine Arts degree (BFA). This degree incorporates core subjects in these three areas, with a major in the career field of choice. The degree

will be shaped to match the goals of the students, and to meet the needs of the marketplace, whether in the world of art, communication, design or technology. The BFA degree includes concentrations in Art Direction/Advertising, Pre-Art Therapy, Fine Arts, Graphic Design, Multimedia Arts, Photography (Commercial and Fine Art), Video Production, and Web Design.

Core requirements for all majors under BFA—36–39

Art History (Choose 4 courses from this list)**—12 credits**
ARCH390; ARTH236, 235, 440; JOUR455; PHTO210, 300

Studio Core—12–13 credits
ART104, 207; DGME130; PHTO115 or 116

Foundation Courses (Choose 4 additional courses from this list)**—12–14 credits**
ART105, 106, 107, 214*; DGME175*, 215; MKTG310*; VDEO130*
*Prerequisite course

Choose a major from:

Multimedia Arts

The multimedia arts degree major prepares students to produce corporate interactive marketing and advertising materials. Students learn to creatively produce and integrate multiple promotion products such as interactive DVDs, and interactive CDs for commercial and corporate applications.

Major in Multimedia Arts—36
COMM405; DGME185, 225, 347; MDIA390, 495; MKTG368; VDEO210, 390 plus 7 upper division credits of electives chosen in consultation with an advisor from Art Direction/Advertising, or Communication, Digital Media, Fine Art, Graphic Design, Photography, Video Production.

Photography

Photography fosters creativity in the production of visual images. The subject of these images and the method used to create them is the focus of this study. The emphases encompass elements of digital, commercial, and fine arts imaging, focusing on individual creativity and photo-journalism. Students may choose a Commercial or Fine Arts direction in consultation with advisor.

Major in Photography—36
MDIA495; PHTO200, 220, 285, 385, plus 17 credits of electives, chosen in consultation with advisor, from Art & Design, Business, Communication, Journalism, Marketing, Multimedia Arts, Photography, Video.

Video Production

Students learn to design and integrate digital video and 3-D animation to produce creative advertising, documentary, promotional products, and TV graphics.

Major in Video Production—36
ENGL467, JOUR230, MDIA390, VDEO216, 320, 340, 390, plus 15 credits of electives, chosen in consultation with advisor, from Art and Design, Business, Photography, Communication, Journalism, Marketing, Multimedia Arts, Video, 3-D Modeling, 3-D Animation.

Web Design

The Web Design major focuses on principles of aesthetics, content, delivery, user interface, web animation, screen design, and multimedia for the creation of web pages.

Major in Web Design—36
ART214, 414; BSAD355; DGME335, 347, 350; JOUR465; MDIA390 plus 7 credits of electives, chosen in consultation with advisor, from Digital Media, Computer Science, Video Production, Graphic Design, or Communication.

Associate of Fine Arts: Digital Media—38–40

SEQUENCE OF TWO-YEAR AND FOUR-YEAR PROGRAMS
The Department of Digital Media and Photography plans programs using the "ladder concept," allowing students to complete as much education as desired before entering the workforce. Two- and four-year programs are available. Students completing the two-year program may go directly into a four-year program in the same area without the loss of credits. The ladder concept allows students to reach the educational goals that best fit their specific needs.

Core requirements for AFA in Digital Media—18–20
Art History (Choose 2 courses from this list)**—6 credits**
ARCH390; ARTH235, 236, 440; JOUR455, PHTO210, 300
Studio Core—6 credits
ART207, DGME130
Foundation Courses (Choose 3 additional courses from this list)**—6–8 credits**
ART105, 106, 107, 214; DGME175*, 215; MKTG310*, PHTO115 or 116; VDEO130
*Prerequisite class

Major—20
DGME185, 215, 225, 250; MDIA495, VDEO210, plus 3 credits of electives in related area.

MINORS

A minor can be a powerful complement to a main career focus. Minors are designed with flexibility to accommodate students' major(s).

Digital Media—20
DGME130, 175, plus 13 credits of electives, chosen in consultation with advisor, from Art Direction/Advertising, Communication, Digital Media, Fine Art, Graphic Design, Photography, Video Production.

Photography—20
DGME175; MDIA275 or PHTO200; PHTO115 or 116 plus 8 credits of electives, chosen in consultation with advisor, from Photography courses.

Other BFA Options at Andrews University
Art Direction/Advertising

Pre-Art Therapy

Fine Art
(See Department of Art & Design, p. 91)

Graphic Design
(See Department of Art & Design, p. 91)

Courses (Credits)

See inside front cover for symbol code.

DIGITAL MEDIA & PHOTOGRAPHY

DGME130 $ (3)
Introduction to Digital Media
An introductory survey of the discipline of digital media. Students are introduced to electronic publishing, basic printing principles, sound digitizing, vector and raster graphics, interactive multimedia, image acquisition and output, web publishing and e-mail. Understanding the Macintosh computer is also covered. Lab required. *Fall, Spring*

DGME165 $ (4)
Principles of Print Production
A study of the publishing and screen graphics industries including prepress concepts, color science, digital printing, textile printing, digital image capture and color management. Also covers more traditional methods in design, layout, text and page composition, film assembly, imposition, and many different printing techniques to produce images on a substrate. Some business will be explored. Open to all students. *Fall*

DGME175 $ (4)
Digital Imaging
A study of raster graphic fundamentals as they apply to scanned images. Emphasis on image manipulation, restoration, tonal enhancement, on-screen graphics, and image acquisition and output. Visual and procedural problems relating to digital imaging will be covered, along with techniques of aesthetic and efficient image enhancement. Prerequisites: DGME130 with a C or better; and ART207. PHTO115 recommended. Lab required. *Fall, Spring*

DGME185 $ (3)
Desktop Publishing I
Students learn to produce publications on desktop computers, including: brochures, magazine covers, corporate stationery, book covers, etc. Course topics incorporate: effective page layout, basic color theory, monitor calibration, gray balance, tone compression, GCR and UCR, digital proofing, image acquisition, and final output. Applications of color theories and color separation are stressed. Lab required. Prerequisite: DGME175. *Fall*

DGME215 $ (2)
Digital Sound
An introduction to digital sound acquisition, manipulation and storage techniques. Students learn fundamentals of sound terminology, audio digitizing and nonlinear editing. Students will then apply this knowledge to various video, interactive and web applications. Lab required. Prerequisite: DGME130. *Fall, Spring*

DGME225 $ (4)
Digital Vector Graphics
A study of digital vector graphic imaging emphasizing graphic production for print, digital multimedia, and web publishing. Lab required. Prerequisite: DGME130 or equivalent. *Fall*

DGME250 $ (3)
Web Publishing
Exploration of the design, storage, retrieval, and delivery of electronic information using text and graphic images. Emphasis on publishing via the Web, kiosks, HTML authoring, and digital formats. Effective organization and planning of data for delivery, efficient design, and ethics are examined. Lab required. Prerequisite: DGME130 or INFS110. *Fall, Spring*

DGME305 $ (3)
Desktop Publishing II
An advanced study of desktop publishing principles including: grid based layout, typographic applications, layout techniques for printing and web publications, effective electronic file preparation, preflighting, and tips for consistent color reproduction. Lab required. Prerequisite: DGME185. *Spring*

DGME335 $ (4)
Web Animation
A course of study designed to develop the skills necessary for producing effective animation for the Web. Lab required. Prerequisites: ART104; DGME130 or equivalent. *Fall, Spring*

DGME347 $ (4)
Creative Presentations
A survey of leading multimedia techniques using state-of-the-art software and covering principles of effective digital multimedia production, interactive new media concepts, basic scripting, animation, digital imaging, and sound manipulation. Students produce digital interactive presentations, kiosks, and web-ready programs. Lab required. Prerequisites: DGME175, 215; VDEO210. *Fall*

DGME350 $ (4)
Web Publishing II
Advanced study of current web development technologies with emphasis in Java scripting, animation, site quality and efficiency. The class also stresses meeting customer needs, and new methods of web development. Lab required. Prerequisite: DGME250. *Fall, Spring*

GRPH345 $ (4)
Advanced Screen Graphics
An in-depth study on making process, simulated process, index and spot separations for screen printing. Other decorating methods will be explored such as transfers, foil, athletic numbering, glow-in-the-dark, puff and UV. Non-textile applications will also be explored such as decorating substrates like plastics (binders, CDs, etc.) and glass (simulated etch, etc.) and many other substrates. Prerequisite: DGME165. *Spring*

MDIA194/494 (1–4)
Project Course/Independent Study
Development of a skill or independent study in a given area by working independently under the supervision of an instructor. Repeatable to 12 credits. Prerequisite: Permission of instructor. *Fall, Spring*

MDIA390 (1–4)
Internship
On-the-job internship experience for students seeking industrial experience which cannot be simulated in a classroom setting. A range of 120–150 clock hours of work are required for each credit. Selected in consultation with the advisor. May be repeated.

MDIA275/485   **(1–4)**
Topics in:_____
Repeatable in various areas.

MDIA495   **(1–4)**
Portfolio Development in:_____
Helps students develop a traditional or digital portfolio for
employment or continuing educational purposes. Emphasis in
direction, development, and refinement of the individual portfolio.
Repeatable to 4 credits. Prerequisites: minimum of 30 credits in a
major and permission of the instructor. *Fall*

MDIA597   **(1–3)**
Independent Study
Individual study or research under the direction of an instructor.
Repeatable to 6 credits. Prerequisite: Permission of department
chair.

PHTO115   **$ (4)**
Introduction to Photography
Basic introduction to the principles of the camera and darkroom
techniques with consideration toward composition, psychological,
and aesthetic attitudes in black-and-white photography. Lab
required. *Fall, Spring*

PHTO116   **$ (3)**
Introduction to Digital Photography
Students are introduced to photography through the use of digital
tools. Digital SLRs and Quadtone printers are used to explore the
technical and aesthetic issues involved in the process of making
images. Consideration will be given to digital workflow, manag-
ing data, and creating visually appealing photographs. Lab
required. *Fall, Spring*

PHTO200   **$ (4)**
Advanced Photography I
Develops the art of photographic perception and use of photogra-
phy as a visual language. Emphasizes craftsmanship and aware-
ness of tools available, as well as aesthetics, and the art of seeing
creatively. Developing skills beyond introductory camera usage is
emphasized. Lab required. Prerequisite: PHTO115. *Fall, Spring*

PHTO210   **(3)**
History of Photography
Historical study of significant contributors in the development of
photography, and their influence on art and society. *Fall, Spring*

PHTO220   **$ (4)**
Color Photography I
Designed to acquaint students with color materials, their handling
and exposure. Aesthetic and communicative aspects of color pho-
tography are stressed in producing visually effective color trans-
parencies. Lab required. Prerequisite: PHTO115 or by permission
of instructor. *Fall*

PHTO285   **$ (4)**
Studio
Study of lighting techniques in standard-equipped studio, empha-
sizing portraiture, commercial illustration, and experimental tech-
niques in black-and-white and color mediums. Lab required.
Prerequisite: PHTO200. *Spring*

PHTO300   **(3)**
Media Ethics
An exploration and discussion of the media and its effect on soci-
ety, covering such issues as body image, violence, politics, etc.
Students study how to recognize the way moral values of media
professionals influence themselves and society. *Spring*

PHTO320   **$ (4)**
Color Photography II
An image-oriented course, drawing on the student background in
the use of color comprehension, photographic technical and aes-
thetic understanding, and working knowledge of emulsion and
digital photography. Information in this class is for the sole pur-
pose of comprehensive color image. Lab required. Prerequisites:
DGME175; PHTO220. *Fall*

PHTO365   **$ (4)**
Advanced Digital Imaging
In-depth manipulation using leading industry software, emphasiz-
ing high quality image acquisition and output. Students learn to
produce duotones, create raster graphic collages, perform critical
image enhancement, create custom palettes, and alpha channels
for image compositing. Repeatable to 8 credits. Lab required.
Prerequisites: ART207; DGME175 (with a B- or better);
PHTO115. *Fall, Spring*

PHTO385   **$ (4)**
Advanced Studio
An individual approach to an advanced level of studio photogra-
phy. Students choose a concentration in the following areas:
Portraiture, People/Fashion, Still-Life, Advertising/ Illustration,
and Location Photography. This course is designed specifically to
learn visual concepts and solve visual problems of the commercial
photo industry. Repeatable to 12 credits. Lab required.
Prerequisite: PHTO285. *Fall, Spring*

PHTO400   **$ (4)**
Digital Photographic Printing
A study in color printing using traditional emulsion based process-
es and digital color output. Lab required. Prerequisites: PHTO220,
365. *Fall*

PHTO410   **$ (4)**
Advanced Photography II
A course designed for the advanced photographer to investigate
personal potential in visual exploration, experimentation, and
technical excellence. Discussion involves expanding personal
vision and exploring new techniques to achieve goals. Repeatable
to 8 credits. Prerequisite: PHTO285. *Spring*

PHTO425   **(4)**
Travel Photography
Designed to be done in conjunction with on-location photography,
and provides a background in the specific needs related to travel.
Photographing people and their land in foreign environments is
emphasized. Unique materials and equipment are discussed as
they relate to travel photography. Repeatable to 8 credits.
Prerequisite: PHTO115.

VDEO130   **$ (2–3)**
Introduction to Video
An introductory course in videography emphasizing the terminol-
ogy, aesthetics, and methods of video production. PHTO115 rec-
ommended. Lab required. *Fall*

VDEO210 $ (3)
Digital Video Editing
An introductory class covering the fundamental techniques and concepts of nonlinear editing. Students explore the process of video editing from conceptualization to final output. Emphasis on sequencing and continuity, use of visual effects, color correction, audio editing, media management, narration and industry terminology. Lab required. Prerequisites: DGME175, VDEO130. *Fall, Spring*

VDEO320 $ (3)
Video Compositing
An introductory course covering the essential components in video compositing. Students learn how to create innovative visual effects and motion graphics for video. Emphasis on text animation, keyframing, masks, alpha channels, 3-D compositing, rendering, application integration, advanced visual and artistic effects. Lab required. Prerequisites: DGME215; VDEO210. *Spring*

VDEO340 $ (3)
Video Shooting
An advanced study in digital video, exploring professional level cameras, lighting, sound and other equipment necessary to make good video, aesthetic issues of creating visual and audio stories, and developing skills and knowledge beyond an introductory level. Lab required. Prerequisites: ART214; JOUR230; VDEO130, 210. *Spring*

VDEO360 $ (4)
3-D Imaging
A study of basic 3-D modeling principles and techniques. Students learn 3-D modeling terminology and how to create 3-dimensional models using polygonal, nurbs, and subdivision techniques. Students also learn basic lighting and surfacing. Lab required. Prerequisites: ART104; DGME175. *Fall*

VDEO370 $ (4)
3-D Animation
A study of 3-D animation techniques implementing key frame, forward and inverse kinematics, dynamics, lighting, paint effects, rendering and more. Lab required. Prerequisites: DGME215; VDEO210, 360. *Spring*

VDEO390 $ (3)
DVD Authoring/Design
A course emphasizing production of interactive DVD- Video, DVD authoring, work flow, story boarding, navigation, menu design, bit budgeting, video and audio encoding, DVD video navigational structures, web linking, proofing, pre-mastering, and recording to DVD-R. Lab required. Prerequisite: DGME347. *Spring*

VDEO465 $ (3)
Video Documentary
Study and application of documentary storytelling techniques. Students will explore the technical and creative use of digital video cameras in documentary filmmaking. Emphasis on interview techniques, story selection and structure. One lab required. Prerequisites: VDEO130, 210, 340. *Fall*

ENGINEERING AND COMPUTER SCIENCE

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George S. Agoki
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Boon-Chai Ng
Nadine Shillingford
Stephen Thorman
Roy Villafane

Academic Programs	Credits
BS: Computing	40
Computer Science Emphasis	
Software Systems Emphasis	
Minor in Computer Science	20
BS in Engineering	
Electrical and Computer Engineering Emphasis	66
Mechanical Engineering Emphasis	66
Minor in Engineering	20
MS: Software Engineering	32
MSA: Engineering Management	
See the School of Business	

Undergraduate Programs

COMPUTING

Two emphases are available in Computing—**Computer Science** and **Software Systems**.

Computer Science focuses on a study of computing as well as on its role in an application area. Areas of interest include artificial intelligence, compilers, computer architectures, computer graphics, computer networks, operating systems, program development, and analytical theory. A degree in computing with the Computer Science emphasis prepares students for graduate study, employment in computer systems/networks, administration/development, software development/maintenance, and for careers in education.

Software Systems is an applied study of computing, focusing on the development and maintenance of software in an application area. A minor in an application area is included as part of the degree. Typical minors might include one of the sciences, behavioral science, or business. Supervised "real-world" projects are a requirement for this degree. A degree in Computing with the Software Systems emphasis prepares students for employment in developing and maintaining commercial applications and for graduate studies in applied computing such as software engineering.