Biomedical Visualization (BVIS)

Courses

**BVIS 500. Biomedical Visualization Techniques. 2 hours.**
An introduction to methods and techniques specific to biomedical visualization, including but not limited to: illustration, 3D modeling, animation, interactive and mobile media, computer programming, gaming, haptics, augmented and virtual reality. Course Information: Extensive computer use required. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 502. Clinical Sciences for Biomedical Visualization. 3 hours.**
Students experience the clinical setting under supervision of UIC residents and attending physicians. Includes an introduction to the surgical specialties, surgical techniques and surgical sketching. Course Information: Previously listed as BVIS 400. Field work required. Prerequisite(s): BVIS 505 and BVIS 510 and BVIS 552; and consent of the instructor.

**BVIS 505. Visual Learning and Visual Thinking I. 2 hours.**
Provides students with the foundation of visual thinking and learning as it applies to life science, healthcare, and medicine. Class Schedule Information: To be properly registered, students must enroll in Lecture and one Laboratory-Discussion.

**BVIS 510. Anatomical Visualization. 3 hours.**
Graphic manipulation and representation of human morphology and gross anatomy. Graphic construction skills, visual standards and conventions, data collection methods, and personal sketch style development. Course Information: Previously listed as BVIS 405. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 518. Web Development. 2 hours.**
Design and development of web-based Internet applications for healthcare, marketing communications, and social media including interface design, usability, information architecture and services such as Search Engine Optimization (SEO). Course Information: Previously listed as BVIS 415. Extensive computer use required. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 519. Modeling I. 3 hours.**
Introduces the aesthetic and technical aspects of digital modeling, texturing, lighting, rendering and compositing techniques used in biomedical images and visualization. Course Information: Previously listed as BVIS 540. Extensive computer use required. Prerequisite(s): BVIS 500 and BVIS 510. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 520. Modeling II. 3 hours.**
Advanced instruction in the aesthetic and technical aspects of digital modeling, including model optimization, advanced modifiers, and application of advanced concepts in several modeling programs. Course Information: Extensive computer use required. Prerequisite(s): BVIS 519. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture-Discussion.

**BVIS 521. Modeling III. 2 hours.**
Advanced instruction in the aesthetic/technical aspects of digital modeling, including advanced sculpting/painting techniques, material manipulation, lighting, model optimization, and application of advanced concepts in several 3D modeling programs. Course Information: Extensive computer use required. Prerequisite(s): BVIS 520. Class Schedule Information: To be properly registered, students must enroll in one Lecture-Discussion and one Laboratory.

**BVIS 522. Illustration Techniques. 3 hours.**
Introduction to line, continuous tone and color rendering techniques. Digital image creation and manipulation, color theory and design, print and electronic publication issues. Course Information: Previously listed as BVIS 420. Prerequisite(s): BVIS 510 Anatomical Visualization. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 530. Surgical Illustration. 4 hours.**
Students attend surgery, research surgical procedures and prepare illustrations for educational and commercial use. Students integrate knowledge of instructional design, anatomy, graphic design, and illustration techniques. Course Information: Prerequisite(s): ANAT 441 and BVIS 522 and BVIS 528 and BVIS 535 and BVIS 552. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 532. Introduction to Anaplastology & Prosthesis Fabrication. 2 hours.**
Introduces the fundamental technical process of prosthesis fabrication. Design, mold-making and color concepts will be addressed. Course Information: Prerequisite(s): ANAT 441 and consent of the instructor. Recommended background: BVIS graduate students with an interest in anaplastology. Course may be audited with permission of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 533. Visual Learning and Visual Thinking II. 2 hours.**
Provides students advanced skills in visual learning and thinking, including information hierarchy, information graphics, selection of evaluation methods for testing of visual message(s) and advanced paper prototyping. Course Information: Previously listed as BVIS 440. Prerequisite(s): BVIS 505. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 535. Medical Legal Visualization. 2 hours.**
Advanced visualization and application of radiographic imaging data for effective communication of both complex and sequential concepts used in the medical legal and courtroom environment. Course Information: Prerequisite(s): BVIS 505 and BVIS 510 and BVIS 522. Class Schedule Information: To be properly registered, students must enroll in one Lecture-Discussion and one Laboratory.

**BVIS 541. Animation I. 2 hours.**
Introduces principles of the animation production pipeline (e.g. choosing a specific target audience, script, storyboard, audio, motion, lighting, rendering, compositing). Course Information: Previously listed as BVIS 545. Extensive computer use required. Prerequisite(s): BVIS 518 and BVIS 535. Recommended background: BVIS 500. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.
**BVIS 542. Animation II.** 3 hours.

This intermediate course explores lighting, basic special effects, in-camera visual effects, basic particle systems, motion modifiers, production management, and use of a render farm. Course Information: Extensive computer use required. Prerequisite(s): BVIS 518 and BVIS 540 and BVIS 541. Recommended background: BVIS 520. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 543. Animation III.** 4 hours.

Focuses on molecular visualization, rigging, camera mapping, advanced camera moves, advanced lighting and advances materials. Introduction to node-based particle systems (PFlow) and dynamic simulations (MassFX). Course Information: Extensive computer use required. Prerequisite(s): BVIS 542. Recommended background: BVIS 519 and BVIS 520. Class Schedule Information: To be properly registered, students must enroll in one Lecture and one Laboratory.

**BVIS 544. Animation IV.** 4 hours.

Instruction in advanced lighting, advanced special effects, Maxscript, rigging, particle systems, morph targets, compositing, development of a demo reel, and optimization/exporting assets for game engines. Course Information: Previously listed as BVIS 525. Taught in English. Extensive computer use required. Prerequisite(s): BVIS 543. Recommended background: BVIS 519 and BVIS 520. Class Schedule Information: To be properly registered, students must enroll in one Lecture and one Laboratory.

**BVIS 546. Virtual Reality and Stereography in Biomedical Visualization.** 2 hours.

Introduction to 3D perception; digital 3D model creation; 3D presentation methods; computer configuration for 3D display; virtual reality in medicine. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 548. Advanced Illustration Techniques.** 3 hours.

An investigation of advanced biomedical illustration techniques through the process of topic research, goal analysis, concept and sketch development, and technique and style exploration. Course Information: Extensive computer use required. Prerequisite(s): BVIS 510 and BVIS 515 and BVIS 522. Class Schedule Information: To be properly registered, students must enroll in one Discussion and one Laboratory.

**BVIS 552. Graphic Design.** 2 hours.

Core concepts of graphic design in relation to the health sciences. Course Information: Previously listed as BVIS 450. Extensive computer use required. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 554. Techniques and Technology in Anaplastology.** 2 hours.

Hands-on laboratory experience with prosthetic materials, design techniques and technology. Emphasis on digital technology and technique selection; health and safety issues related to laboratory equipment and clinical procedures. Course Information: Prerequisite(s): ANAT 441. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture-Discussion.

**BVIS 555. Clinical Anaplastology.** 4 hours.

Clinical course applying knowledge, techniques and materials in prosthetic rehabilitation including osseointegration. Provision of facial/somatic prosthetic services in a clinical setting requiring direct interaction with patients with disfigurements. Course Information: Prerequisite(s): ANAT 441 and and BVIS 554 or consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 560. Molecular Pharmacology for Biomedical Visualization.** 3 hours.

Foundation in molecular pharmacology with advanced research and visual communication skills to solve scientific communication problems for all audiences: scientist, investor, business and medical professional. Course Information: Extensive computer use required. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture-Discussion.

**BVIS 562. Advanced Graphic Design.** 3 hours.

Advanced concepts of graphic design communication including symbolic graphic translation, logo mark design with a focus on concept development, and branding for the health sciences. Course Information: Previously listed as BVIS 515. Extensive computer use required. Prerequisite(s): BVIS 552. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

**BVIS 575. Business Practices.** 3 hours.

Business practices for the biomedical visualization professional including communication, negotiation, ethics, copyright, licensing, proposals, contracts, business structure, project management, finance, marketing, portfolio, and presentations. Course Information: Previously listed as BVIS 480.

**BVIS 580. Practicum in Biomedical Visualization.** 1-12 hours.

Field experience under supervision of a professional expert in a biomedical communication setting that is consistent with student's area of concentration and career goals. Course Information: May be repeated. Prerequisite(s): Consent of the instructor.

**BVIS 594. Special Topics in Biomedical Visualization.** 1-4 hours.

An in depth study of a biomedical visualization topic of importance selected by the faculty. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.

**BVIS 595. Seminar in Biomedical Visualization.** 1 hour.

Topics of current interest in biomedical visualization. Includes discussion of relevant journal articles and important new developments in the field. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated.

**BVIS 596. Independent Study.** 1-4 hours.

For graduate students who wish to pursue independent study of special problems in the student's area of interest not related to their project/thesis research. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Graduate standing and consent of the instructor.

**BVIS 597. Project Research.** 0-4 hours.

Independent investigation that draws upon the professional experience and knowledge synthesis of the student. Students investigate a topic/problem in their field, document a visualization project or write a paper, and deliver an oral presentation. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): BHIS 499 and BHIS 500; and consent of the instructor.

**BVIS 598. Research in Biomedical Visualization.** 0-16 hours.

Independent research in biomedical visualization directed by a faculty member. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. Prerequisite(s): BHIS 499 and BHIS 500; and consent of instructor.