

# CAAHEP Accreditation

## **The Accreditation Review Committee for the Medical Illustrator (ARC-MI)**

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# **Entry-Level Competencies for the Medical Illustrator**

**An Addendum to  
The Standards and Guidelines of an Accredited Educational Program  
for the Medical Illustrator**

(Approved in 2006 by the Council on Education, Accreditation Review Committee for the Medical Illustrator, and the Board of Governors of the Association of Medical Illustrators)

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## Entry-Level Competencies for the Medical Illustrator

The curriculum for medical illustrators must be at the master's level (or higher) and must demonstrate compliance with the latest edition of the Standards and the Entry-Level Competencies for the Medical Illustrator.

### Description of the Profession

Medical illustrators specialize in the visual transformation, display, and communication of scientific information. Their graduate level training in biomedical science, art, design, visual technology, education, and communication enables them to understand and visualize scientific data and concepts to teach the general public and professionals in the fields of health care, research, pharmaceuticals, biotechnology, and demonstrative evidence.

To accomplish this, graduates must demonstrate the following entry-level competencies:

#### 1. Basic Science Competencies

**Goal: Graduates must demonstrate an advanced level of knowledge in the biomedical sciences. To demonstrate the following competencies, graduates must have completed an advanced course in human anatomy with dissection and a minimum of at least four other biomedical science courses from the following list: embryology, histology, neuroanatomy, cell biology, molecular biology, physiology, pathology, immunology, pharmacology, or genetics.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Understand and visualize scientific content,
- Research biomedical content,
- Understand the scientific method and principles of research,
- Recognize the difference between proven biomedical content and a hypothesis,
- Create accurate and effective visual representations of biomedical subject matter.

#### 2. Cognitive Competencies

##### a. Goal: Graduates must demonstrate visualization skills.

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Visualize scientific structures, processes, and concepts,
- Visualize objects in 2- and 3-dimensions, perspective, cross-section, cut-away, sequence, and/or from different viewpoints,
- Create visual images from verbal or written description,
- Demonstrate sophisticated visual problem solving and conceptualization through concept sketches,
- Solve visual communication problems using graphic conventions and symbolism.

##### b. Goal: Graduates must demonstrate analytical thinking skills.

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Analyze, prioritize, and define goals and objectives of a communication problem,
- Develop strategies for solving complex communication problems with appropriate application of verbal, visual, symbolic, realistic, and motion or interactive media,
- Break down problems or complex tasks into manageable parts,
- Analyze relationships among the parts of a problem or situation,
- Set priorities for tasks in order of importance,
- Anticipate obstacles, plan solutions, and project future actions.

##### c. Goal: Graduates must demonstrate conceptual thinking skills.

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Identify key supporting and underlying issues in complex communication situations,
- Use creative, conceptual, and inductive reasoning in generating solutions to visual communication problems, for example, visually conceptualize a process or mechanism of action in biomedical science, such as a biochemical reaction.

### 3. Research Competencies

**Goal: Graduates must demonstrate competency in the academic research process through a graduate research project or thesis.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Review and critically appraise the literature on a topic using print and Internet resources,
- Formulate meaningful questions,
- Formulate a statement of purpose or hypothesis for a proposed visual research project,
- Apply critical thinking, time management, and organizational skills in the conduct of a visual research project,
- Collect and organize data and resource information,
- Utilize appropriate research methods e.g. focus groups and audience testing, when indicated,
- Assess data and evaluate resources,
- Report the research findings in writing using accepted scientific style and in an oral presentation.

### 4. Applied Design and Production Competencies

**a. Goal: Graduates must be able to draw and accurately record biomedical subject matter.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Create visuals that satisfy the objectives and ensure content accuracy by: reviewing the literature, doing dissections, using imaging modalities, making photographic references, attending surgery, consulting with subject matter experts, et cetera,
- Apply principles of measurement, proportion, perspective, lighting, and texture,
- Apply theories of color, design, and storyboarding.

**b. Goal: Graduates must be able to organize and graphically design information to facilitate effective communication in educational, commercial, and legal environments.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Design information and visual approach for a specific and/or multiple audience(s) taking into consideration issues of literacy, disability and educational backgrounds,
- Orient the viewer with graphic devices, such as a site map, schematic of whole organism showing location of a detailed drawing, et cetera,
- Control the focus of the viewer through emphasis, sequence, color, size, placement, et cetera,
- Combine and order pictorial and textural information into a unified message or story,
- Use appropriate motion media (2D or 3D) to communicate structure-function relationships and mechanisms of action, physiology, or pathology,

**c. Goal: Graduates must be able to design and produce effective educational materials that satisfy the needs of the learner as well as a client/content expert.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Elicit client and learner needs through written and verbal communication,
- Analyze and define goals and objectives of educational materials,
- Select an appropriate medium, style, and method of delivery,

- Apply relevant research findings from education, communication, and visual perception to visual products,
- Produce effective educational materials,
- Evaluate the effectiveness of the finished product.

**d. Goal: Graduates must utilize a variety of media and production techniques in appropriate applications and understand production processes sufficiently to communicate with pre-press companies, art directors, et cetera.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to: (The following are examples and may not be required in all accredited programs.)*

- Create didactic illustration for print media: books, journals, posters, brochures,
- Create didactic illustration for projection and electronic media,
- Produce digital images at correct resolution for print, projection and electronic media,
- Demonstrate familiarity with current forms of visual data storage and delivery,
- Demonstrate basic competency in scripting or programming languages,
- Apply layout and graphic design skills to print and electronic media,
- Create medical-legal illustration for demonstrative evidence,
- Demonstrate content knowledge, organization, and storyboarding skills for motion media,
- Demonstrate sculpting, mold making, and casting techniques as they apply to models, museum techniques, facial and somato prosthetics, and forensic reconstruction,
- Create a professional portfolio or presentation of work.

## 5. Communication Competencies

**Goal: Graduates must be able to communicate effectively with clients, subject matter experts, co-workers, supervisors, and vendors in oral and written form.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Determine the communication needs of a client,
- Use a process of formative feedback, followed by modifications,
- Consult with subject matter experts to achieve an acceptable result,
- Work cooperatively with supervisor(s) and other team members,
- Make oral presentations to clients and colleagues,
- Apply appropriate writing skills to business correspondence, contracts, proposals, reports, scripts and/or articles for publication.

## 6. Professional and Ethical Competencies

**Goal: Graduates must be aware of professional practice and ethical conduct.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Use professional practice with clients, business partners, and colleagues,
- Use professional conduct in special situations, such as the operating room, autopsy, dissection, patient examination, hiring, interviewing, et cetera,
- Maintain confidentiality as it applies to protected patient health information, clients, business partners, and colleagues,
- Create original imagery and credit others' ideas and imagery when appropriate,
- Maintain integrity when creating legal exhibits that can unfairly sway a jury.

## 7. Business and Management Competencies

**Goal: Graduates must be aware of established business and management practices.**

*Entry-level competency is evidenced by a graduate's knowledge and ability to:*

- Estimate and manage project costs, time, and resources,
- Understand copyright laws and registration of creative work,
- Understand laws of intellectual property and be an advocate for fair practice,
- Be aware of legal hiring practices,
- Recognize various business models e.g., a salaried position, sole proprietorship, and partnership,
- Negotiate equitable employment, contracts, and agreements,
- Keep accurate business records,
- Use word processing, spreadsheets, data management software, and the Internet in managing a professional practice,
- Market and promote one's own skills/work and that of a department/business, institution, and profession,
- Access information from professional organizations like:
  - AMI - Association of Medical Illustrators,
  - IPA – Illustrators' Partnership,
  - GNSI – Guild of Natural Science Illustrators,
  - BCA – BioCommunications Association,
  - GAG – Graphic Artists Guild,
  - SI – Society of Illustrators,
  - ACM SIGGRAPH – Association for Computing Machinery Special Interest Group Graphics, and
  - AAA – American Anaplastology Association.