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INTRODUCTION

The interdepartmental undergraduate BPM I major is designed for students who want to combine their interests and aptitudes in science and art. Based on the theme of *Communicating Science Through Art*, the major prepares students for careers in biological visualization / illustration or for graduate education in medical visualization / illustration. Graduates enter fields such as biocommunications, environmental display design, freelance illustration, UX/UI and museum display design, creative technologies, instructional design, and various careers in the publishing, research and education, and visual communication industries.

The information below outlines the specific requirements for a BA degree in Biological/Pre-Medical Illustration (BPMI). Keep in mind that there are four components to your degree in BPMI:

- Liberal arts general education
- Science core and advanced courses
- Art core and advanced courses
- Electives

The prudent student will give special attention to the elective area by selecting courses that will enhance their BPMI degree—by adding a minor, for example.

PART 1. COLLEGE REQUIREMENTS

A. Communication Proficiency Requirements

Course	Title	Credits
ENGL 150	Critical Thinking and Communication	3
ENGL 250	Written, Oral, Visual, and Electronic Composition (grade of C or better)	3
LIB 160	Information Literacy	1
ENGL 302-316	Continuing English proficiency Choose one course from ENGL 302-316	3
	Two semesters of college-level world language	
	Students with 3 years in high school world language are exempt	

Total Credits: 10-18

B. Liberal Arts and Sciences Requirements

Choose courses to meet International Perspectives & US Diversity requirements

Group		Credits
1	Arts and Humanities	12
	(see https://www.las.iastate.edu/academics/general-education/)	
	*Consider History of Science 280, 281; Art History 280, 281; DSN S 183	
П	Natural Sciences and Mathematical Disciplines	12-13
	MATH 104, MATH 165, MATH 181, STAT 101, STAT 104, or more advanced	(3-4)
	CHEM 163 and 163L or CHEM 177 and 177L	(5)
	(requires high school chemistry or CHEM 50)	(4)
	CHEM 231 and 231L	(4)
Ш	Social Sciences	9
	(see https://www.las.iastate.edu/academics/general-education/)	

Total Credits: 33-34

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PART 2. COURSE REQUIREMENTS FOR MAJOR IN BPMI (continued in PART 3)

Biological Sciences Core Course Title Prerequisite Credits **LAS 293D** BPMI Learning Community Seminar (1-0) F. 1 **BIOL 211/211L** Principles of Biology I (3-3) F.S. H.S. Biology 4 Principles of Biology II (3-3) F.S. 4 **BIOL 212/212L** H.S. Biology or CHEM 163 or CHEM 177 **BIOL 255** Fundamentals of Human Anatomy (3-0) F. 3 H.S. Biology and Chemistry **BIOL 256** Fundamentals of Human Physiology (3-0) S. H.S. Biology and Chemistry 3 BIOL 255 recommended **BIOL 351** Comparative Chordate Anatomy (3-4) S. BIOL 212, Junior 5 BIOL 356 or Dendrology (2-2) F. **BIOL 211** (3) Plant Systematics (2-4) S. BIOL 366 or **BIOL 211** (4) **BIOL 454** Plant Anatomy (3-3) F. BIOL 212L, BIOL 366 rec. (4)

Total Credits: 23-24

B. Art Core			
Course	Title	Prerequisite	Credits
DSN S 131	Drawing I (1-6) F.S.		4
ARTIS 230	Drawing II (0-6) F.S.	DSN S 131	3
ARTIS 233	Watercolor Painting (0-6) F.S.	ARTIS 230	3
ARTIS 308	Computer Modeling, Rendering & Virtual	ARTIS 230	3
	Photography (0-6) F.S.		
ARTIS 330	Drawing III: Life Drawing (0-6) F.S.	ARTIS 230	3
BPMI 323	Scientific Illustration Principles & Techniques	ARTIS 230 and 3 credits in	3
	(0-6) F.	biological sciences	
BPMI 326	Illustration and Illustration Software (0-6) S.	BPMI 323	3
BPMI 327	Illustration as Communication (0-6) F.	BPMI 326	3
BPMI 337	Application of Scientific Illustration Techniques	BPMI 327	3
	(0-6) S.		
BPMI 497	Illustration Internship	Permission	1

Total Credits: 29

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Beyond the core preparation, students must take 9 credits in the advanced science area and 12 credits in the advanced art area. The courses acceptable in these areas follow. Other courses in art and biological sciences may be acceptable. See BPMI advisors and/or the BPMI Advisory Committee.

C. Advanced Art Area (Select 12 total credits from below. At least 6 credits must be studio classes)

Pre-Med Illustration Area (Advantageous for creating portfolio pieces required/recommended by most graduate schools. Courses also serve non-pre-med pathways)

Course	Title	Credits	Prerequisite
ARCH 335	Three-Dimensional Studio (1-4)	3	
ARTIS 330	Drawing III: Life Drawing	3	Repeat
ARTIS 408	Principles of 3D Animation (0-6)	3	ARTIS 308
ARTIS 430	Drawing IV (0-6) F.S.	3	ARTIS 330
BPMI 323	Scientific Illustration Principles and Techniques	3	Repeat
BPMI 326	Illustration and Illustration Software	3	Repeat
BPMI 337	Application of Scientific Illustration Techniques	3	Repeat
BPMI 490	Independent Study	1-3	Permission
BPMI 491	Portfolio Design and Professional Development (3-0) S.	2	BPMI 337, junior or senior in BPMI, or by permission
BPMI 494	Special Topics in Illustration	1-3	

General Art Area

Course	Title	Credits	Prerequisite
ARTIS 213	Studio Fundamentals: Painting (0-8) F.S.	2	
ARTIS 227	Introduction to Creative Digital Photography (0-6)	3	DSN S 131
ARTIS 229	Introduction to Darkroom Photography (0-6)	3	DSN S 131
ARTIS 238	Painting I (0-6) F.S.	3	ARTIS 230
ARTIS 329	Creative Photography (0-6)	3	ARTIS 210 or 229 or permission
ARTIS 338	Painting II (0-6)	3	ARTIS 238 or ARTIS 213 and ARTIS 230
ARTIS 407	Principles of 3D Character Animation (0-6)	3	ARTIS 308
ARTIS 409	Computer/Video Game Design and Development	3	Art or graphics emphasis: ARTIS 230 and ARTIS 308
ARTIS 431	Character and Scene Design	3	ARTIS 330
ARTIS 432	Sequential Narrative Drawing	3	ARTIS 330
ARTIS 438	Painting III (0-6) F.S.	3	ARTIS 338
ARTIS 475	Interactive Art	3	ARTIS 475: ARTIS 212 or Permission of Instructor
ARTIS 482	Selected Topics in Studio Art* *See advisor to confirm specific topic is approved	3	Permission
ARTIS 493	Workshop* *See advisor to confirm specific topic is approved	1-3	Permission
BPMI 395	Field Illustration S.SS.	1-3	Permission

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JL MC 306	Broadcast Media Production (2-2) F.S.	3	JL MC 201 (C+
			minimum)
JL MC 315	Multimedia Production (2-2) F.S.	3	JL MC 308 or 310 or 316
			or equivalent computer
			design proficiency

D. Advanced Science Area (Select 9 credits total from below)

Pre-Med Illustration Science Area (required/recommended courses by most graduate schools)

Course	Title	Credits	Prerequisite
		Credits	•
BBMB 316	Principles of Biochemistry (3-0) F.	3	CHEM 231 or 331; BIOL
			212; BIOL 313 and 314
			recommended
BIOL 313	Principles of Genetics (3-0) F.S.SS.	3	BIOL 211/L, 212/L
BIOL 314	Principles of Molecular Cell Biology (3-0) F.S.	3	BIOL 211/L, 212/L
BIOL 335	Principles of Human and Other Animal Physiology	3	BIOL 211, 212
	(3-0) S.		
BIOL 352	Vertebrate Histology (3-3) S.	4	BIOL 212
BIOL 423	Developmental Biology (3-0) S.	3	BIOL 313
BMS 329	Anatomy & Physiology of Domestic Animals (3-0) S.	3	BIOL 212/212L
BMS 448X	Principles of Human Gross Anatomy (2-6) S.	4	BIOL 255 or equivalent
			and introductory biology
GEN 340	Human Genetics (3-0) F.S.SS.	3	BIOL 313 or GEN 313

General Science Area

Course	Title	Credits	Prerequisite
A ECL 321	Fish Biology (2-3) S.	3	BIOL 365
A ECL 366	Natural History of Iowa Vertebrates (2-3) S.	3	BIOL 211/L, 212/L
A ECL 457	Herpetology (2-0) F.	2	BIOL 351 or 365
A ECL 458	Ornithology (2-0) S.	2	BIOL 351 or 365
A ECL 459	Mammalogy (2-0) S.	2	BIOL 351 or 365
ANTHR 307	Biological Anthropology (2-2) S.	3	ANTHR 202
ANTHR 319	Skeletal Biology (2-2) F.	3	ANTHR 307 or BIOL
ANTHR 424	Forensic Anthropology (2-2) S.	3	ANTHR 202 or 307
			ANTHR 319 rec.
BBMB 301	Survey of Biochemistry (3-0) S.SS.	3	CHEM 231 or 331
BIOL 312	Ecology (3-3) F.SS.	4	BIOL 211/L, 212/L
BIOL 313L	Genetics Laboratory (0-3) F.S.	1	BIOL 313
BIOL 315	Biological Evolution (3-0) F.S.	3	BIOL 211/L, 212/L
BIOL 328	Molecular and Cellular Biology of Human Diseases F.	3	BIOL 212
BIOL 336	Ecological and Evolutionary Animal Physiology	3	BIOL 211, 212
BIOL 350	Comprehensive Human Anatomy (3-0) F.	3	BIOL 211, 212
BIOL 353	Introductory Parasitology (3-0) S.	3	BIOL 212
BIOL 354	Animal Behavior (3-0) F.	3	BIOL 212
BIOL 355	Plants and People (3-0) S.	3	BIOL 211/L
BIOL 356	Dendrology (2-2) F.	3	BIOL 211
BIOL 364	Invertebrate Biology (3-4) F.	3-4	BIOL 211, 212

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-	Vertebrate Biology (3-2) F.	4	BIOL 211/L, 212/L
BIOL 366	Plant Systematics (2-4) S.	4	BIOL 211
BIOL 393	North American Field Trips in Biology	1-4	Permission
BIOL 394	nternational Field Trips in Biology	1-4	Permission
BIOL 402	ntroduction to Pathology (3-0) F.	3	BIOL 211/L, 212/L
BIOL 430	Principles of Plant Physiology (3-0)	3	BIOL 313 or GEN 320; BIOL 314 or BBMB 301; CHEM 231 or 332; PHYS 106, 155 or 111
BIOL 436	Neurobiology (3-0) F.	3	BIOL 212
BIOL 454	Plant Anatomy <i>(3-3) F.</i>	4	BIOL 212L, BIOL 366 recommended
BIOL 455	Bryophyte and Lichen Biodiversity (2-3)	3	BIOL 211/L
BIOL 456	Principles of Mycology (2-3) F.	3	10 credits of Biology
BIOL 474	Plant Ecology (3-0) S.	3	BIOL 312
BIOL 488	dentification of Aquatic Organisms (0-3) F.S.	1	
BPMI 395	Field Illustration S.SS.	1-3	Permission
ENT 370	nsect Biology (2-3) F.	3	BIOL 101 or 211
ENT 374	nsects and Our Health (3-0) S.	3	3 credits of BIOL
MICRO 302	Biology of Microorganisms (3-0) F.S.SS.	3	BIOL 211, 212, and 1 semester of CHEM
MICRO 302L	Microbiology Laboratory (0-3) F.S.	1	MICRO 302
MICRO 310	Medical Microbiology (3-0) F.	3	MICRO 302 (or MICRO 201 if at least B grade)
NREM 301	Natural Resource Ecology and Soils (3-3) F.	4	BIOL 211/L; FOR 201 or second course in BIOL
NREM 330	Principles of Interpretation (2-3) S.	3	6 credits BIOL
		_	
PSYCH 310	Brain and Behavior (3-0) F.S.	3	PSYCH 101

PART 3. OTHER SPECIFIC REQUIREMENTS

- 1. Students admitted with deficiencies in high school preparation will take remedial courses that often do not carry college credit or that count only as electives. Such courses should be taken during the first year.
- 2. Transfer students with 3 years of high school world language must provide documentation since H.S. transcripts are presently not required for admission.
- 3. The English proficiency grade requirement for BPMI majors is a C or better English 250, and in an upper level writing course taught by the English Department (choose one from ENGL 302-316).
- 4. A grade of C- or better is required in all biological science and art courses in the major. An overall C average or better (2.0+) in the major is required to graduate.
- A minimum of 45 credits in courses at the 300-level or above from a 4-year institution is required for graduation. Transfer students from community colleges will need to plan courses carefully with their advisor.
- 6. Courses taken on a Pass-Not Pass basis cannot be used to meet general education, major, or minor requirements—they may only count as electives, but they can count toward the 300-level requirement.
- 7. Students must submit a portfolio to the BPMI Advisory committee and must be accepted into the program in order to graduate with a degree in BPMI. (See details below)

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PART 4. PORTFOLIOS

A. Submission

To apply for admission as a full member of the BPMI program, a student must meet the following criteria:

- enrolled at ISU for at least one year
- completed 30 college credits, including introductory courses in art, biology, and general chemistry
- GPA equal to or greater than 2.00
- credit for or enrollment in BPMI 323
- at least 30 credits remaining in their BPMI degree plan

Applications are reviewed one-two times per semester, at either the start or end of the term. Specific dates and times are announced via email. The Committee strongly encourages students to apply the first week of the semester immediately after winter break and completing BPMI 323 and prior to taking BPMI 337. Application for acceptance into the BPMI program requires the submission of a portfolio of a student's best works for committee review. Students may apply up to 3 times. The physical portfolio does not need to be purchased; however, if the student chooses to make his/her own portfolio it should demonstrate craftsmanship and professionalism. The following statements are portfolio requirements--failure to follow the requirements may result in denial of the application:

- a) The portfolio must contain 10 to 15 drawings, paintings, or other forms of art
 - Ensure your name is on all of your application materials. For each piece in your portfolio, include labels indicating the year completed, which course and assignment works are attributed to, and the medium.
 - Include two examples of process work and the final piece that resulted for a course assignment. This can be shown across two portfolio pages and comprise a compilation of parts developed for a particular assignment such as thumbnails, rough annotated sketches, texture, color, and light on form studies, and preliminary drawings. Through this process work, it should be evident that you are considering multiple ideas, conducting thorough research, annotating your sketches, and evaluating a range of compositions in order to advance your best solution for the final piece.
 - Include 2 sketchbooks. These should include gesture drawings, blind contour drawings, and multiple sketches demonstrating that you are sketching often, if not daily, and that through sketching you are expressing a sense of inquiry about the natural world and science. At least 75% of the sketches should be from direct observation and not photographs/screens. At least 40% of the sketches should be from direct observation of the human form.
 - o Include 1 continuous tone traditionally rendered grayscale graphite drawing showing your understanding of light on form (LOF). To do so, implement an upper left light source that is directed as though it is cast over your left shoulder and back into space diagonally to the right. Therefore, cast shadows should go back into space diagonally to the right. Render a cube, sphere, cylinder, one organic object (such as a vegetable) from direct observation, and one invented/imagined object with correct LOF in one scene, arranged in an interesting and effective composition. For the invented object, you will need to apply what you understand about LOF without the benefit of direct observation. Your drawing surface should be no smaller than 14 x 17 inches and a hot-press/smooth surface is recommended. A successful outcome will include objects and shadows that are well-sized and placed thoughtfully in the composition.
 - o Include one self-portrait, any medium, fully rendered from direct observation, life-size.

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- Include a series of traditionally rendered hand drawings: 3 line drawings showing a hand performing 3 different actions, such as cutting a ribbon, slicing an apple, and flipping a coin, and 1 hand fully rendered in color.
- o Consideration should be given to biological subject matter and works done from direct observation.
- Objects such as bones, flowers or plants (even if fake or plastic), gourds, and other biomorphic forms are good to include.
- One piece should be something created "on your own" not for a class and can include one of the required drawings above.
- Works do not have to be matted, but present them with good craftsmanship and professionalism. Use clean-cut coversheets to protect your work, especially for friable media, like charcoal. Presenting at least one matted piece demonstrates another level of presentation and professionalism.
- Very few pieces should be done from screens, or photographs. Absolutely no work should be rendered from another person's photograph without permission. Copying images from online, or another source, that are not your own, without permission, is not allowed and is infringement of copyright law.
- b) The submission should also include a concise and well-written **300-500-word essay** explaining why you want to be a scientific/medical illustrator. Why did you choose this as your professional career?
- c) The submission should include an unofficial transcript of your current and past courses and grades.
- d) **Academic Dishonesty.** Application submissions will follow lowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office.

http://www.dso.iastate.edu/ja/academic/misconduct.html

- e) **Academic Integrity**. Academic integrity might best be defined as doing one's own academic work without unauthorized assistance from other persons or resources. More specifically, academic integrity means that students take their coursework seriously and place significant value on learning and engagement in the classroom and while completing assignments and projects and preparing Program Applications.
 - Academic Dishonesty in Program Applications would include the following:
 - Tracing, or working from photographic images you do not own, and/or do not have permission to use. You may use photographs for reference and work from your own images of objects that you photographed, but work should be done primarily from direct observation and follow directions indicated above.
 - Submitting work inspired by another's work without permission/attribution, as in a Master's Study.
 - Submitting any drawing done either in whole or part by another individual.
 - The use of any unauthorized information in the taking of any test.
 - Knowingly assisting another student in obtaining or using unauthorized materials.
 - Plagiarizing work of another individual.

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B. Development

It is important as a BPMI major to develop a quality portfolio before graduating. Good grades alone do not translate into a job in the desired field or admission to graduate school. Students need to show employers they can produce quality work. Students should consider this during their time at lowa State University. Portfolio development should begin early in your academic career and care should be given in physically protecting work over time. Students are encouraged to consult with their academic advisor and BPMI faculty early and often about portfolios.

PART 5. BPMI 490/497

A. BPMI 490 Guidelines

BPMI 490 is an independent study course that may be taken for 1 to 3 credits--students may use up to 3 credits to meet the advanced art requirement for a BPMI degree.

Independent study does not mean that the student simply works alone and then gets credit--it is intended to provide an opportunity to work with a faculty member (or an artist not on the faculty) to learn a special technique or develop a skill beyond the level taught in one of the BPMI or Art and Design courses. We expect high quality artwork be produced. This course should really be called "directed study." Students interested in earning BPMI 490 credit should:

- 1. Have a written description and goal of what they expect to get out of the experience and a timeline with production milestones
- 2. Discuss the project with a faculty member who plans to supervise/direct the experience
- 3. See academic advisors to complete a schedule change form
- 4. Meet with the supervising independent study faculty member at least every two weeks, or as stated by the faculty member, through the entire semester for critique and guidance
- 5. Submit finished assignments by deadline set by the supervising faculty member

B. BPMI 497 Internship

BPMI students must complete an internship in order to graduate. A BPMI internship consists of an illustration (or another visual communication piece) as part of a project that is done for a client. It may be volunteer work or work for which the student is paid. Internships can occur any time of year, including over the summer, and may span multiple terms depending on the nature of the work. They can be conducted on or off campus. To fulfill the requirement, students must first fill out two forms and present on Professional Day in addition to doing the internship work.

First, after identifying an internship opportunity, fill out an **internship application form** and get approval from your BPMI faculty advisor *before beginning the internship*. This form is a type of contract and addresses important concerns such as copyright, scope of the project, and deadlines. Orientation for filling out the form is required and can be viewed in the video, "Video: Filling Out the Internship Form" on the BPMI Canvas site, where the form template is also available to download. Only when the application is approved will it be possible to register for BPMI 497.

Second, create a cybox folder and invite your BPMI faculty and academic advisors to share it. Post your signed internship application form, progress work, manuscript, and all applicable internship materials to this folder. It is critical that you make a schedule to pace the work so that you have time to complete a high-quality product by your client's deadline and to also create final presentation materials for BPMI Professional Day (guidelines

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below). In your scheduling, work with your faculty advisor to establish work-in-progress review dates so they may provide you with feedback and guidance for client communication. Identify the semester in which the internship will be completed and your presentation materials will be prepared for Professional Day. **This is the term in which you must register for at least one credit of BPMI 497.** To register for BPMI 497, fill out a schedule change form with help from academic advisor. BPMI Professional Day is held at the end of each semester, the Sunday prior to prep week. Throughout the internship duration, be sure to keep and document your process work, including sketches and client feedback.

Third, review the Internship Module on the BPMI Canvas site to get further information on what is required for your BPMI Professional Day presentation.

Fourth, complete the internship work and present materials at BPMI Professional Day. BPMI 497 is graded satisfactory/fail (S/F). In order to earn S you must complete the work described in the application form, obtain a signature from the client indicating the work is satisfactory, and give a presentation at BPMI Professional Day. The presentation must involve display of the actual final work or of copies/photos of the work. Failure to give a presentation will result in an F grade. Below are the guidelines and bullet points to address in presenting your internship work.

- Prepare a poster presentation including a title, abstract, introduction, methods, results, and future directions sections (see BPMI Poster Presentation Guidelines on Canvas).
- Include the full name and contact of client/company/lab/instructor/s you worked with and your name
- Describe the scope and nature of the work (target audience, medium, output type, research required, how many pieces, if it was published/produced, date and title, etc.)
- Include process work, iterations, and feedback in your methods section
- Feature the final piece/s you have created
- List what you learned from the experience—what went well, where could you improve, and how you will apply this experience to related opportunities in the future

PART 6. MINORS

BPMI students are encouraged to support their career goals by adding a minor. Minors in English, Computer Science, Entrepreneurial Studies, or General Business, are a few examples. To earn a minor, courses set forth by the minor department, including at least 9 credits that are not used to meet any other department, college, or university requirements, must be taken. To declare a minor, the student must take courses indicated by the department offering the minor and must also file a curriculum change form in consultation with academic advisor.

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PART 7. SAMPLE FOUR-YEAR PLAN

First Year (Pre-BPMI)

FALL		SPRING	
BIOL 211 and 211L	4	BIOL 212 and 212L	4
DSN S 131	4	ARTIS 230	3
LAS 293D learning community	1	CHEM 231 and 231L	4
CHEM 163 and 163L	5	Humanities	3
ENGL 150 or Humanities	3	Social Science	3
	17		17

---During summer, prepare portfolio for BPMI Program application / apply during second year------Consider taking a science course over the summer---

Second Year (Pre-BPMI)

FALL		SPRING	
BIOL 255	3	BIOL 256	3
BPMI 323	3	BPMI 326	3
ARTIS 330	3	ARTIS 233	3
STAT or MATH	3-4	ENGL 250 and LIB 160	4
World Language or Humanities	3-4	World Language or Social Science	3-4

---Consider study abroad, or attending summer AMI / GNSI / ASBA Conferences & Workshops or lowa Lakeside Lab to take advanced biology courses---

15-17

---Consider a BPMI 497 Internship for this summer (obtain faculty advisor permission second year, spring term)---

Third Year (BPMI)

FALL		SPRING	
BIOL 356, 366 or 454	3-4	BIOL 351	5
Advanced Biology	3	BPMI 337	3
BPMI 327	3	BPMI 497	1+
ARTIS 308	3	Advanced Art	3
Social Science	3	Humanities	3

15-16

---Work with BPMI Advisory Committee to plan senior portfolio---

---If planning to attend graduate school, take GRE over the summer, or at the latest in the fall, and prepare up to 20 portfolio pieces for submission over the summer and fine tune in the fall---

Fourth Year (BPMI)

FALL		SPRING	
Advanced Biology	3-4	Advanced Biology	3-4
Advanced Art	3	Advanced Art	3
Advanced Art	3	Humanities or Elective	3
Advanced English	3	Social Science or Elective	3
Humanities or Social Science	3		

15-16 12-13

Total Credits = 120-132

16-17

15

^{*}Note: All LAS degrees require a minimum of 120 credits, including 45 credits of 300+ level courses. You must also satisfy the LAS world language requirement.