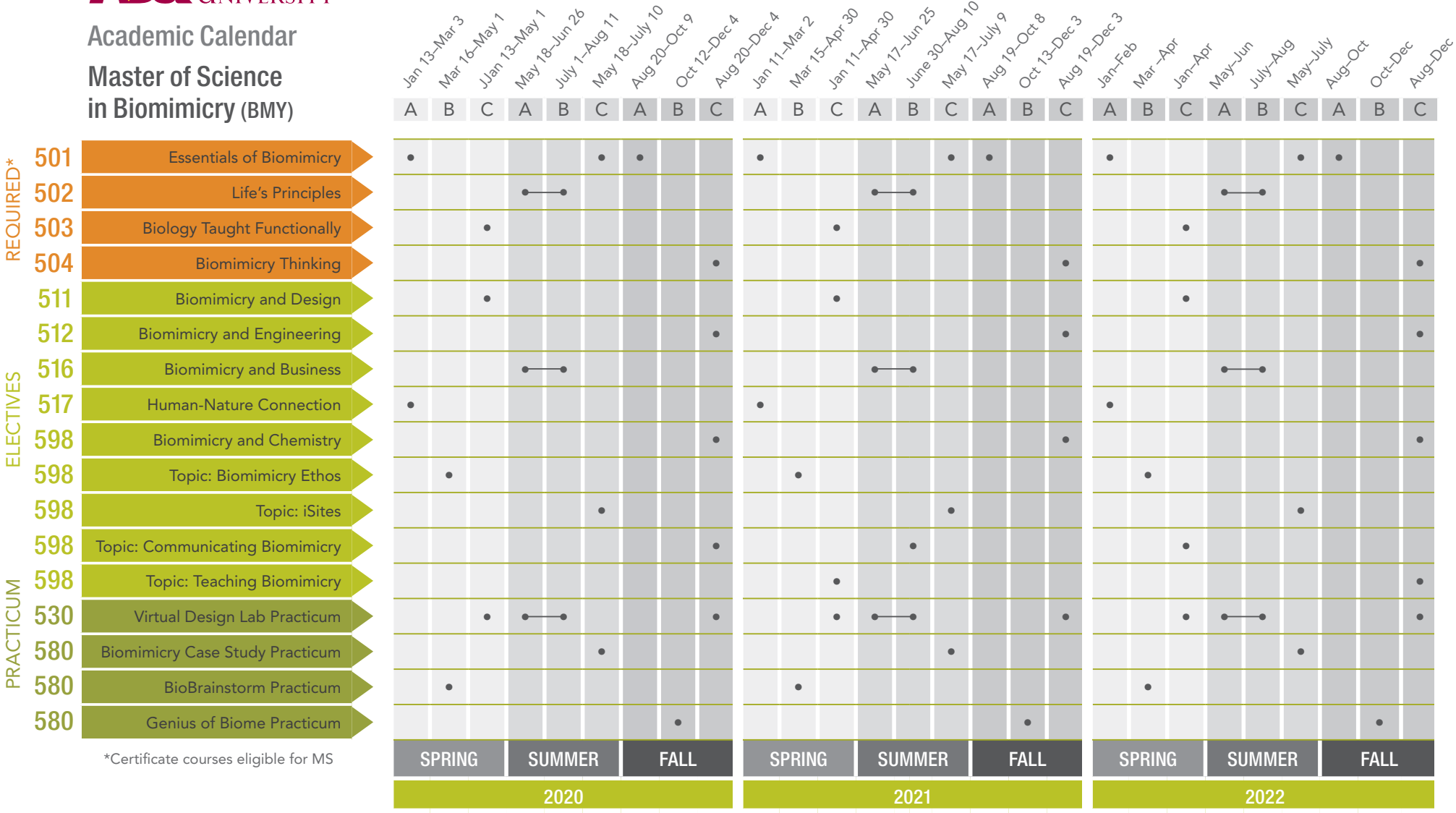
ASU Arizona State University

Academic Calendar

Master of Science in Biomimicry (BMY)



*Certificate courses eligible for MS

Fall/Spring Session A: first 7.5 week session
Fall/Spring Session B: second 7.5 week session
Fall/Spring Session C: full semester (15 weeks)

Summer Session A: first 6-week session
Summer Session B: second 6-week session
(•—• Enroll in Summer A; course dates span A + B)
Summer Session C: 8 week session

Required Courses *(13 credits)*

Essentials of Biomimicry

BMY 501 | 1 Credit

The Essentials of Biomimicry is a one-quarter class (7.5 weeks) offered as introductory sampler to the various topics (discipline, emulate, ethos, (re)connect & iSites, human-nature connection, Biomimicry Thinking, and Life's Principles) within the discipline of biomimicry. Each week is devoted to a specific topic and is led by a different instructor. The course is intended to provide a basic overview of each aspect of the discipline with ample opportunity for conversation and dialogue around the specific components, with an understanding that greater depth into each topic can be learned by taking the advanced BMY courses.

Life's Principles

BMY 502 | 4 Credits

Life's Principles are nature's universal design guidelines based on 3.8 billion years of successful strategies across all life. With instruction by Dr. Dayna Baumeister, this 15-week course on-line takes participants on a deep dive of Life's Principles. It includes the review and study of life's operating conditions on Earth, the six primary principles, and their related sub-principles. This course gives participants the knowledge necessary to bring these design guidelines into practice and provides opportunity to integrate them into one's discipline.

Biology Taught Functionally

BMY 503 | 4 Credits

Biomimicry teaches biology through the lens of function, thereby providing a core understanding in biology for all students, no matter their background. This 15 week course explores how biologists gather and research information and how that knowledge can inform other disciplines. It also introduces the art of translating biological concepts into strategies for application, which is then carried throughout all the courses. You will learn how to work with biologists on a biomimicry team and how to weave biology and biomimicry together. You will learn to look at nature through the function lens, and how to identify subject matter experts needed for interdisciplinary teams.

Biomimicry Thinking

BMY 504 | 4 Credits

Biomimicry Thinking is the practice of biomimicry from a methodology-based approach. Led by Dr. Dayna Baumeister, this 15-week exploration into the Biomimicry methodology reviews how biology and biomimicry can be incorporated into the four major phases of any design process: scoping, discovering, creating, and evaluating. It introduces the art of translating biological concepts into strategies for application and building a taxonomy of design principles.

Elective Courses *(11 credits)*

Biomimicry and Design

BMY 511 | 3 Credits

The Biomimicry and Design course will prepare participants to design sustainable innovations using the biomimicry philosophy and methodology. Participants will complete a 15-week series of lectures and assignments to demystify the design thinking process, understand how to harness the potential of approaching challenges with a design mind, distill a design challenge, understand user needs, build a bridge between biology and design, use a methodology for discovering models from nature, abstract design principles from bio-inspired strategies, and translate those principles into sustainable innovations. The course is not designed to teach one how to be an designer per se, but rather how the discipline works in order to facilitate involvement of designers into the practice of biomimicry.

Biomimicry and Engineering

BMY 512 | 3 Credits

Biomimicry & Engineering will prepare participants to understand the field of engineering, identify the types of engineers and what each one does, what constrains engineers work under, materials selected by engineers, how to present biological ideas to engineers and how to integrate ideas from their discipline into sustainable engineering designs using biomimicry principles. The course is not designed to teach one how to be an engineer, but rather how the discipline works in order to facilitate involvement of engineers in the practice of biomimicry. A final team project designed to put these ideas into practice is required.

Biomimicry and Business

BMY 516 | 3 Credits

Biomimicry and Business Course is a three credit course that resides at the overlap of the two disciplines. The course addresses business topics from the biomimicry point of view - it explains mechanisms and tools for comparing and contrasting business and nature. As part of the course, participants are challenged to question conventional ways of conducting business and come up with new approaches based on a different point of view. The course is not designed to teach one how to run a business, but rather how the discipline works in order to facilitate involvement of business in the practice of biomimicry.

Biomimicry and Chemistry

BMY 598 | 3 Credits

There is a common misconception that chemicals are man-made entities that contaminate an otherwise chemical-free natural word, but nothing could be further from the truth—nature is ALIVE with chemistry! This 15-week course will provide students with insights into what makes nature's living chemistry so effective at achieving the same functionalities required of commercial chemicals and materials, while at the same time, creating conditions conducive to life. The course is designed for the non-chemist, but chemists will also walk away with a fresh appreciation for nature's elegant and sophisticated chemistry principles. A final team project will allow students to experience the practical application of nature's chemistry principles.

Elective Courses Continued *(11credits)*

Human-Nature Connection

BMY 517 | 2 Credits

This 15-week course seeks to ground the emerging discipline of biomimicry as a continuation of our ancestral connection with nature. Human-Nature Connection engages participants in an exploration of the meaning and value of connecting with nature. Topics include defining humans, nature, and our connection with nature; establishing the evolutionary, personal, and socio-cultural influences on the different expressions of this connection; and illustrating the relevance of biomimicry to the human-nature connection.

Topic: Teaching Biomimicry

BMY 598 | 1 Credit

The ability to teach the practice of biomimicry to a wide variety of audiences across many disciplines, venues, and situations is a critical skill. The Teaching Biomimicry course develops these skills through a wide variety of exercises, trainings, and feedback. Students will learn how to create and execute meaningful learning experiences in biomimicry. Students will assemble course deliverables into a portfolio demonstrating their teaching skills.

Topic: Biomimicry Ethos

BMY 598 | 1 Credit

Biomimicry offers us a new way to (re) examine our relationship with the natural world of which we are a part of, and encourages us to commit to a more harmonious and sustainable way of living on this planet. The Biomimicry Ethos course explores the natural pathway that leads from experiencing and understanding life, to connecting with life, to committing to care for life. Course participants are presented with a practical toolkit to facilitate a personal journey of discovery. Drawing from diverse academic disciplines as well as various social practices, the course provides practitioners with tangible approaches to care for non-human biological life on the basis of respect and gratitude. Through guided inquiry, analysis, critique, and reflection, participants develop and express a rational justification for our obligations to life on this planet. Students will be able to articulate how the practice of biomimicry embodies and advances the core tenets of sustainability.

Topic: iSites

BMY 598 | 1 Credit

The iSites: Biomimetic Nature Journaling course offers a kick-start to the lifelong practice of nature journaling with a biomimetic intention. Tutorials for becoming a biomimetic nature journalist include drawing techniques, materials selection, and development of observation skills. A series of nature journaling assignments are designed to offer a variety of approaches to nature journaling while also requiring that getting outside and into the natural world becomes a very comfortable experience and a source of inspiration. It is important to understand that this course will require going outside for 30 minutes on a daily basis for the 7.5 weeks of the course—participants should plan accordingly.

Topic: Communicating Biomimicry

BMY 598 | 1 Credit

The ability to articulate the practice and potential of biomimicry to a wide variety of audiences across many disciplines, venues, and situations is critical. This course develops this skill through a wide variety of exercises, trainings, and feedback. Students will develop visual, written, and auditory presentations and customize those for different kinds of audiences and situations, including cross-disciplinary applications and public and organization specific settings. Students will learn how to communicate biomimicry in the field, in the boardroom, with media, and in labs.

Culminating Experience *(6 credits)*

Virtual Design Lab Practicum

BMY 530 | 2 Credits

This practicum is designed to allow participants to dive deep into the biomimicry tools and resources presented during the program and to apply them selectively to a specific and unique opportunity of the students choosing. Projects should have a meaningful outcome achievable within the semester, and should engage the scoping, discovering, creating and evaluating phases of Biomimicry Thinking. Deliverables are milestone based, and the final deliverable should have application in a real-world setting.

Biomimicry Case Study Practicum

BMY 580 | 2 Credits

This practicum is designed to allow participants to dive deep into the business case for biomimicry, by doing an in-depth case study analysis of a specific biomimicry example. During the 15-week semester, each individual will identify, research, and write up a case study from the business perspective. At the conclusion of the practicum and the receipt of everyone's final and polished version, we will compile these case studies for a specific release in a format TBD.

BioBrainstorm Practicum

BMY 580 | 2 Credits

This practicum is designed to allow participants to dive deep into the specific biomimicry tools and techniques of a BioBrainstorm. Working in teams, each team will identify a challenge, discover relevant strategies from the biological literature, interpret and translate the scientific information including creating illustrative graphics, summarize the findings, build a taxonomy, and learn how to present the information in a biomimicry context so that it is relevant to design.

Biomimicry Genius of Biome Practicum

BMY 580 | 2 Credits

This practicum is designed to allow participants to dive deep into the specific biomimicry tools and techniques of a Genius of Place. During the 15-week period, each team will identify a biome of interest, research place-specific strategies from the biological literature for that biome, interpret and translate the scientific information including creating illustrative graphics, summarize the findings, build a taxonomy, and learn how to present the information in a biomimicry context so that it is relevant to place-based design.