***“Mapping” Program Learning Outcomes***

***to Course Learning Outcomes***

**Case Study Information:**

**“Beekeeping at Cranmore Community College”**

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***FICTIONAL CASE STUDY: BEEKEEPING AT CRANMORE COMMUNITY COLLEGE***

**Background**

The faculty of the Apicultural Science Program at Cranmore Community College has been encouraged by their dean to conduct a complete evaluation of their A.A.S. degree program. The faculty over time has changed the program curriculum in attempts to adjust to increasing needs in the agriculture industry for enhanced approaches to sustainability.

The Apicultural Science A.A.S. degree program at Cranmore Community College is small – only four full-time faculty members staff the courses, with a small corps of adjuncts who allow for all of the courses to run at least once per year. Given the small size of the program, and the need for curricular support for courses provided by other science departments, the Apicultural Science A.A.S. degree contains no “program elective” course options for its students.

About 20 students graduate each year from CCC with their degrees in Apicultural Science. Cranmore has strong financial support for all of its science programs from external industry, and CCC science graduates with A.A.S. degrees tend to find jobs easily upon graduation within a 50-mile radius of the campus. It is likewise not uncommon for many of the A.A.S. students to transfer their degree credits to four-year institutions, although relatively few do so from the Apicultural Science program.

The Apicultural Science Program is housed within the Department of Applied Sciences and Technologies at Cranmore. The program faculty is considered to be a sub-discipline within the larger department, and the faculty meets together as a disciplinary unit at least once monthly. Larger departmental meetings with the other sub-disciplines are convened about once every two months.

CURRICULUM DESIGN

With the Apicultural Science Program’s goals and program objectives/outcomes well-stated, the design of the department’s curriculum should next be considered.

*Required Courses for the A.A.S. Degree in Apicultural Science (in recommended sequence)*

*APS 101 Introduction to Apicultural Science (3 credits)*

*ENV 111 Environmental Science – Intro to Zoology (4 credits)*

*APS 112 Principles of Apicultural Science (4 credits)*

*ENV 172 Environmental Science – Entomology (4 credits)*

*APS 122 Practices of Apicultural Science (4 credits)*

*ENV 231 Environmental Science – Agriculture (4 credits)*

*APS 201 Beekeeping Environments (4 credits)*

*BIO 205 Genetics (4 credits)*

*APS 244 The Science of Honey Production (4 credits)*

*APS 260 Beekeeping Business Practices (4 credits)*

*APS 252 Capstone Seminar in Apicultural Science (4 credits)*

*ENG 101 College Writing (required) (3 credits)*

*MTH 150 Business Math (required) (4 credits)*

*SOC 140 Human Relationships w/ Natural World (req.) (3 credits)*

*COM 110 Public Speaking (required) (3 credits)*

*Humanities elective (3 credits)*

*Free elective (3 credits)*

*[Total required degree credits = 62]*

**Mission**

*“The mission of the Apicultural Science Program of Cranmore Community College is to train students pursing the A.A.S. degree in Apicultural Science with the skills and knowledge necessary to become responsible, ethical, and knowledgeable apiarists capable of contributing to the profession of beekeeping as entrepreneurs, business owners, and technicians in the field.”*

**Program Goals**

*Apicultural Science as a specialized A.A.S. degree offers students the unique opportunity to contribute professionally to an increasingly important role in the maintenance and sustainability of American and world agriculture. The faculty of Cranmore’s Apicultural Science Program provides students with the most up-to-date knowledge and technological proficiency available in the field, with the intent of engendering within students an interest in promoting further progress in the development of groundbreaking techniques in apiculture.*

*The Program faculty’s goals for its students are as follows:*

* *Of students accepted into the program, at least 80% will successfully complete the A.A.S. degree within three years;*
* *Graduating students will be substantively competent in all aspects of basic apiary science;*
* *Graduating students will be technically competent apiarists, capable of managing beehives as a business endeavor;*
* *Graduates will engage in lifelong learning and actively contribute to the community of beekeepers by belonging to either the Organization of Professional Beekeepers (OPB) or the American Association of Apicultural Science (AAPS);*
* *Graduates will be sufficiently proficient in the environmental sciences to be able to transfer to a four-year institutions for further study, if they so choose;*
* *Of students wishing to gain certification as professional apiarists, 100% will successfully pass the OPB certifying examination in no more than two attempts.*

These goals were developed by the Apicultural Science faculty, in collaboration with their program’s Advisory Committee, several years ago. Frequent discussions with current professional contacts have confirmed that these goals are still appropriate for today’s A.A.S. degree in Apicultural Science.

**NOTE**: Because the faculty operated under a set of expectations framed by an outside accrediting body, Program Operational Outcomes were expressed as (and wrapped in with) their Program Goals. Cranmore Community College’s internal assessment processes allowed for the Apicultural degree program evaluation to proceed with this approach without any conflict.

**Program Learning Outcomes**

*A graduate of the A.A.S. degree program in Apicultural Science will be able to:*

* *Construct and maintain beehives of appropriate design relative to the beekeeper’s purpose (breeding, honey production, supporting agriculture, etc.) and the breed of bee;*
* *Create appropriate breeding environments and apply professionally-recommended techniques in promoting healthy fertility and growth of bee populations;*
* *Apply and interpret basic genetic tests of bee samples;*
* *Conduct appropriate hybridization techniques;*
* *Identify, recognize, and respond to insect behaviors, including those of bee, competing insect, and predator insect species;*
* *Promote health and wellness among bee populations;*
* *Cultivate plant species supportive of the healthy maintenance of bee populations;*
* *Recognize and manage responses to threats to bee populations, such as changes in the seasons, extreme weather conditions, or the presence of pesticides and other toxins in the environment;*
* *Apply basic business management principles to the management of the costs and expenses of beekeeping;*
* *Discuss the ethical principles underpinning beekeeping as both a hobby and a profession;*
* *Describe the role of bee species in the maintenance of a healthy and sustainable agricultural business;*
* *Teach and train apprentice beekeepers in the rudimentary aspects of the practice of beekeeping;*
* *Communicate capably the basic tenets of good beekeeping practices to individuals unfamiliar with bees and the practice of beekeeping.*

It is generally understood that Program Learning Outcomes support the program’s broader overarching goals. In this example, these learning outcomes directly support Goals B and C, and indirectly support Goals E and F. Goal A of the program requires additional aggregate-level data outside of the classroom for support. Goal D can only be supported with an alumni network or graduate survey.