



1998-2017 HORTICULTURE PROGRAM REVIEW

In our 1998 Review we asked for and in 2002 received a beautiful new greenhouse complex, shown above.

This 2017 Review covers our progress since then and plans into the future.

Bergen Community College

Division of Mathematics, Science & Technology

Department of Biology & Horticulture

Horticulture Program Review 2016-2017

**A Process for
Self-Evaluation and
Continuous Improvement**



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ACKNOWLEDGEMENTS

As with any major publication, the assistance of many people benefit the results and their generosity in assisting with providing information, photos and reviewing this manuscript is greatly appreciated.

We extend our appreciation for the support of the Administration at all levels for their ongoing support of the Horticulture Program, especially to Professor Bob Highley, Dr. P.J. Ricatto, and Dr. William Mullaney.

Each of the “Program Review Team” members and notably, Dr. Steve Fischer, were instrumental in the preparation of the materials. Dr. Fischer provided much information on the program’s history and future direction that is incorporated into the manuscript.

The Advisory Board as a whole is an amazing resource of information and support for BCC Horticulture as well as internship/employment opportunities for students and graduates.

Our technical assistant, Garrett Planten, continues to provide invaluable assistance that allowed time for the preparation of this manuscript and other faculty responsibilities.

The BCC Center for Institutional Effectiveness staff, notably Jesse Jacondin, and documentation for Horticulture, along with supplemental research and images was very important.

Wilson Aguilar of the BCC Graphics Department assisted with multiple scans of images for use in this publication and the associated PowerPoint presentation.

Program Assessment staff, Professor Melissa Krieger and Professor Gail Fernandez, were most helpful in preparing the Horticulture Assessments presented in Appendix M.

The BCC library staff, especially Professor Edith Sirianni, generated the inventory report and regularly assisted in acquiring new materials.

In accord with Dr. Fischer, I would like to thank the students of the Horticulture program as well as our plant-focused Biology students. To quote Dr. Fischer in the previous review: “they continue to energize me and confirm my belief that people are like plants – if you give them the right environment and room enough to grow, they will amaze you and beautify our world.”

*Professor Linda Wiles
Program Review Team Chair & Editor*

PROGRAM REVIEW TEAM

Program Review Team Chair & Editor: Professor Linda Wiles

Department Chair: Professor Bob Highley, Department of Biology and Horticulture

Program Coordinator: Dr. Steven Fischer

Designated Staff: Mr. Garrett Planten

Adjunct Faculty: Mr. Bob DeRosa

Retired Faculty: Professor Susan Gruben

Advisory Committee: Mr. Jim Dusenbery, Ms. Betty Wiest

Association Representative (NJLCA): Greg Carpenter

Faculty Member from another Department: Dr. Sydney Birnback

Library Liaison: Professor Edith Sirianni

Divisional Dean: Dr. P.J. Ricatto

External Reviewer: Mr. Ted Szczawinski, Director of Curriculum, Passaic County Technical Institute

Vice President of Center for Institutional Effectiveness, ex officio: Dr. Yun K. Kim

Vice President of Academic Affairs, ex officio: Dr. William Mullaney

Date of this report: June 2017

Period of Years Being Reviewed: 2012-2017

**SCHEDULE FOR EXTERNAL REVIEWER
VISIT FOR THE HORTICULTURE PROGRAM**

June 20, 2017

3:15-3:45 pm – Meeting with VP of Academic Affairs, Dr. William Mullaney

in Pitkin, Rm. ____

4:00-4:30 pm – Meeting with Divisional Dean, P. J. Ricatto

in Pitkin, Rm. ____

4:30-4:45 pm – Meeting with Department Chair, Robert Highley

in Pitkin, Rm. ____

5:00-5:45 pm – Meeting with Horticulture Advisory Board, Faculty, Staff and Students

in Ender Hall, Rm E187

6:00-7:30 pm – Social with graduates of the program, current students, Program Review Committee, Advisory Board, and invited guests in the Ender Hall Cyber Café.

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HORTICULTURE PROGRAM OVERVIEW

Horticulture Program Mission Statements

It is our mission to provide for our students, the industry and the program.

For Students:

- Training in the art, science & business of the ornamental plant industries.
- Fostering professionalism and entrepreneurship.
- Encouraging creative problem-solving.
- Promoting teamwork and individual effort.
- Providing opportunities for hands-on learning.
- Encouraging and responding to student input.
- Developing abilities to research, evaluate and organize information to present their findings before teachers, peers, employers or clients.

For Industry:

- Supporting, and drawing support from, northern New Jersey horticultural businesses, associations and academic institutions.
- Seeking assistance from organizations that can further the technological know-how of faculty and students.
- Maintaining good relations with companies that offer employment opportunities to students.

For the Program:

- Ongoing quality management reviews with the Advisory Committee, faculty and staff.
- Modifying existing courses of study and developing new ones in response to industry needs.
- Incorporating the new scientific and market developments into course materials as they occur.

HORTICULTURE PROGRAM OVERVIEW

Bergen Community College Mission and Goals in Relation to Horticulture

Vision, Mission & Values

Vision:

Bergen Community College will be a dynamic partner by bridging potential with opportunities for educational, professional and personal growth.

Analysis: Horticulture emphasizes this dynamic partnership via the three-part provisions for our students, our industry and our program.

Mission:

To inspire our community to realize a better future.

Analysis: Horticulture is intrinsically focused on the future by encouraging the creative problem solving and hands-on learning of students, the long-term relationships in the industry, and continual incorporation of new developments in science and business into course materials.

Values:

To fulfill the vision and mission of Bergen Community College, these core values will guide our daily endeavors: learning, excellence, integrity, respect and creativity.

Analysis: Horticulture is an art and science where creativity, learning and excellence are primary; our program expands this to incorporate integrity and respect for all persons.



Peony from BCC Gardens

SUMMARY OF SIGNIFICANT DEVELOPMENTS SINCE LAST PROGRAM REVIEW

Date of last program review: May 26, 1998

See Appendix D for Summary of Last Program Review

CHALLENGES FACING THE HORTICULTURE PROGRAM:

Curriculum Changes:

- The reduction of the Design/Build A.A.S. option to a Certificate of Achievement is also currently in process. [Appendix G]
- The consolidation of the current Certificates in Landscaping and Grounds Management into a Landscape and Grounds Management Certificate that is currently in process. [Appendix H]

Resolution: Developed proposals for these two changes with rationale and support statements for each as noted in the Appendices sections.

Assessment and Program Review Simultaneously:

Resolution: Using this as an opportunity to incorporate information from each to improve the other and the Horticulture Program overall.

Note: Assistance received from colleagues in completing both is much appreciated.

Facilities Changes:

- Ender Hall educational use changes in Spring 2017.

Resolution: Office relocation for Professor Wiles and Garrett Planten is in progress.

Scheduling:

- Keeping core classes scheduled on a yearly or 18 month basis, and all others rotated on a day/evening schedule biennially. Note that certain classes can only be scheduled during evening hours in Summer U.

Resolution: Surveying students annually on Horticultural course requirements for scheduling purposes.

Plant Production & Maintenance:

- Production of perennial plants for sale and landscape use.
- Maintenance of existing plant materials and additions to woody plant collection for class use.
- Maintenance of tropical plant collection over the summer.

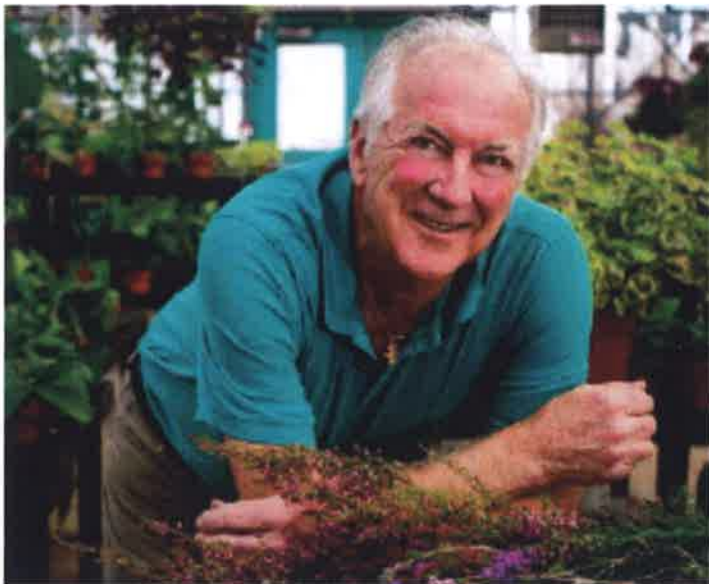
Resolution: Increasing the facilities, improving plant maintenance and encouraging students to apply for work-study and part-time work experience in the Department.

Following is a page view of the 201 Magazine feature article on the Bergen Community College Horticulture Program's 40th Anniversary. It highlights the work that has been accomplished over the years.

Blooming Curriculum

As horticulture program at Bergen Community College turns 40, millennials catch on

WRITTEN BY LUCY PROBERT PHOTOGRAPHY BY CHRIS MARKSBURY



(201)

THE BEST OF BERGEN

NORTH CITY & GLA TODAY & TOMORROW

VOLUME 14, NUMBER 3
MARCH 2017

PLANTING FOR GREEN: Maria Piro, Ph.D., began at Bergen Community College in 1977 and is now the horticulture program coordinator.

There has been a lot of growing going on in the greenhouse as well as behind the glass. Bergen Community College's 40th anniversary is a time to look back at the program's history and the people who have made it what it is today. The horticulture program has been a valuable training center for those interested in careers in plants, landscaping and garden care, as well as those who like to be outdoors and interested in a healthy lifestyle.

As a career school, horticulture was wanted to be a part of the college's offerings. In the early 1970s, a professor, who was also a landscaper, was hired to teach the program. The program was then moved to the new building, and the program has been growing ever since.

"I have seen many horticulture professionals in the field, and they are all very happy about what they do. They love the work, and they love the students."

— Maria Piro, Ph.D.

The horticulture program at Bergen Community College is a well-known and respected program. It has been around for 40 years, and it has grown from a small program to a large one. The program is now one of the largest in the state, and it has a reputation for being one of the best. The program is run by Maria Piro, Ph.D., who has been at the college since 1977. She is a horticulture professor and the program coordinator. She has a degree in horticulture from the University of California, Davis, and she has worked in the field for many years. She is a very experienced and knowledgeable person, and she is a great teacher. She has helped many students go on to successful careers in the field, and she is proud of the program. The program is a well-run and respected one, and it is a great place to learn and grow.



PLANTING FOR GREEN: A student working in the greenhouse.

Horticulture Program Through the Years

Year	Program	Location	Faculty	Students
1977	Horticulture	Building 10	1	10
1978	Horticulture	Building 10	1	10
1979	Horticulture	Building 10	1	10
1980	Horticulture	Building 10	1	10
1981	Horticulture	Building 10	1	10
1982	Horticulture	Building 10	1	10
1983	Horticulture	Building 10	1	10
1984	Horticulture	Building 10	1	10
1985	Horticulture	Building 10	1	10
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1988	Horticulture	Building 10	1	10
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2012	Horticulture	Building 10	1	10
2013	Horticulture	Building 10	1	10
2014	Horticulture	Building 10	1	10
2015	Horticulture	Building 10	1	10
2016	Horticulture	Building 10	1	10
2017	Horticulture	Building 10	1	10



PLANTING FOR GREEN: A group of students and faculty members standing in front of a greenhouse.

The horticulture program at Bergen Community College is a well-known and respected program. It has been around for 40 years, and it has grown from a small program to a large one. The program is now one of the largest in the state, and it has a reputation for being one of the best. The program is run by Maria Piro, Ph.D., who has been at the college since 1977. She is a horticulture professor and the program coordinator. She has a degree in horticulture from the University of California, Davis, and she has worked in the field for many years. She is a very experienced and knowledgeable person, and she is a great teacher. She has helped many students go on to successful careers in the field, and she is proud of the program. The program is a well-run and respected one, and it is a great place to learn and grow.

HISTORY OF THE PROGRAM

The forty years of training students in Horticultural careers have seen the Horticulture Program develop from starting with plants grown on window sills to using a 1,000 sq. ft. Lord & Burnham energy inefficient greenhouse to using a 2,400 sq. ft. energy efficient, computer controlled, state-of-the-art structure with four growing environments.

It started with a single Biology Department faculty member, Professor Jacob “Jack” Fisher, back in 1975 that evolved into a Fisher and Fischer team in 1977. This evolution would take it from a single A.A.S. degree to two degrees (Horticulture and Horticulture Therapy) and two certificates (Landscaping and Floral Design).

When Professor Jack Fisher retired, Professor Susan Gruben, a former BCC graduate and recent Rutgers graduate with a Masters in Plant Pathology, became a full time faculty member with the Biology & Horticulture Department. The Program continued to evolve from a “smorgasbord” approach to dropping the Horticulture Therapy degree and replacing it with a Design/Build degree and a Grounds Management Certificate.

With the retirement of Professor Susan Gruben, the search committee selected Professor Linda Wiles, Penn State Multi-County Extension Educator with a Masters in Horticulture/Genetics from Penn State, to complement the Program teaching style and advance the Department’s science perspective for students.

Our Advisory Board includes some former students who have since become some of the leading contractors in Bergen County and hold other key positions in the Horticulture Industry. Today, we also continue to enjoy the very talented group of adjunct faculty represented by Bob DeRosa (Owner, DeRosa Landscaping), Chris Raimondi (President and CEO, Raimondi Horticulture Group), Nick Groetsma, Ted Szczawinski (Director of Curriculum, Passaic County Technical Institute). With these and others, we are able to put “Experts in the Field” in a wide variety of classes.

TIMELINE 1998 TO PRESENT

- 1998 Professor Susan Gruben joins the faculty from lecturer to a tenure track position. Fran Ruff is hired as Horticulture Technician.
- 2000 A Grounds Management Certificate is added to the curriculum to broaden the course offerings into Arboriculture and Equipment Management.
- 2000-2004 Bergen Horticulture students participate in the world famous Macy's Spring Flower Show
- 2002 A state-of-the-art 2,400 sq. ft. greenhouse facility is opened with four environmentally computer controlled areas.
- 2006 Bergen Community College becomes the statewide testing site for the CLT (Certified Landscape Technician) Program for the NJLCA (New Jersey Landscape Contractors Association)
- 2009 A Landscape Design Build A.A.S. Degree is added to the Horticulture curriculum.
- 2009 Garrett Planten is hired as Horticulture Technician to replace Fran Ruff who moved to Early Childhood at BCC.
- 2012 Professor Linda Wiles joins the faculty as an Assistant Professor of Biology and Horticulture upon the retirement of Professor Susan Gruben.
- 2017 The BCC Horticulture Department celebrates our 40th Anniversary.

ACCOMPLISHMENTS OF HORTICULTURE PROGRAM ACTION PLANS

Scheduling:

- In recent years class scheduling has improved with very few cancelled Horticulture classes.
- Annual surveys of students' Horticultural course requirements were instituted for scheduling to assure students have a voice in programs.

Faculty and Student Employers:

- Well-run student intern programs (work experience) build greater expertise beyond class.
- There is a highly productive faculty and staff working relationship.

Resources:

- Horticulture Advisory Board meets for three annual business meetings (Winter, Summer and Fall) and one, or more, social events (at which business is also discussed) such as the December Holiday Open House. The social events are also open to Horticulture students and alumni, BCC faculty, staff and administrators.

Analysis: One of our greatest assets is the Horticulture Advisory Board that helps the faculty meet challenges like expertise in the field, association connections, educational opportunities, site training experiences for Co-Op. and employment.

- Maintaining, utilizing and expanding the collection of plant materials on campus that have multi-course uses in Horticulture (Landscape Plants & Materials I, Plant Propagation, Pests of Ornamental Plants, Arboriculture, Floral Design, and Turf & Grounds Maintenance), in Biology (People Plant Relationships, General Botany, Sustainability in Nature), and in courses taught by other Biology Department colleagues.
- Horticulture, in coordination with the BCC Library staff, has substantially increased the Library holdings for Horticulture, BIO 130 People Plant Relationships, BIO 131 General Botany and BIO 217 Sustainability in Nature.

Student Support - Financial:

Two internal memorial scholarships are funded via plant, floral design and holiday arrangements and directed to recipients from the BCC Foundation:

- Jacob 'Jack' Fisher, former BCC professor and founder of the program
- Peter Snell, late adjunct professor of Horticulture

Several external scholarships have been created and awarded to Horticulture students,

- New Jersey Landscape Contractors Association (NJLCA) \$750.
3 awarded in 2016
- Brenda Boffa (new in 2017), former graduate of the program

Three garden clubs have also provided scholarships

- Ho-Ho-Kus Garden Club - \$1,000
- Saddle River Garden Club - \$1,000
- Sundial Garden Club - \$500



Holiday Arrangements to Support
Student Scholarships

BCC Support – Materials:

The Horticulture Program has assisted many other programs and individuals with flowers and plants for special events, among others, these include:

- Hotel Restaurant Management
- Theatre Arts Productions
- Student Services
- President's Holiday Party
- Student Clubs
- **BCC 40th Anniversary event – shown below**
- and many others



HORTICULTURE PROGRAM WORK IN PROGRESS OR PLANNED

Community Support:

- *In Progress:* The Wild Plants Garden to be dedicated to Brenda Boffa (behind large rock near Ender Hall).
- *Planned:* Horticulture is initiating the establishment of the Paramus campus as an Audubon site.
- *In Progress:* “Sustainability in Nature” course to benefit the community via student leadership training.

Resources:

- *In Progress:* The labeling of native and introduced woody plant species on campus is being undertaken.
- *In Progress:* Expanding propagation of selected perennials, ground covers, tropical plants, succulents and herbs via a stock plant production system.
- *In Progress:* The redesign and replanting of the Ender Hall Center Courtyard due to storm damage and loss of our very large weeping willow. A dwarf conifer garden and other plantings will change the area from a shade garden to a sun garden.

Resources – Facilities:

- *In Progress:* Increased storage facilities obtained from a 8’ x 12’ wood shed to be placed in the greenhouse complex area.
- *Planned:* Horticulture is introducing raised beds and cold frames for maintaining cold requiring plants.
- *Planned:* Development of a Master Plan of the grounds and gardens around Ender Hall.



HORTICULTURE PROGRAM FOCUS ON STUDENTS

STUDENTS UTILIZED THEIR HORTICULTURAL TRAINING IN THE FOLLOWING WAYS

Directly after or concurrently while at BCC:

- Establishment of their own business
- Secured employment with a landscape contracting business, garden center as a designer, foreman for maintenance or construction, or entered a horticulture sales position
- Horticultural equipment and supplies position
- Employment with municipal and county parks department

The following graphic is from the AAS.ST.LAND Program Dashboard. This illustrates the significant growth in potential occupations for our students. While many register as AAS.ST.HORT, they are also interested in working in these target occupations, with or without acquiring further education after BCC.

Job Growth for Target Occupations, NYC Metro Area*

Target Occupation	2015 Jobs	2025 Jobs	% Change
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	6,304	7,043	12.0%
Landscaping and Groundskeeping Workers	57,917	66,795	15.0%
Pesticide Handlers, Sprayers, and Applicators	839	990	18.0%
TOTAL	65,060	74,828	15.0%

**NYC Metro Area includes: NJ counties: Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union NY counties: Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester PA counties : Pike*

Source: EMSI Economic Modeling, NJ Dept. of Labor

Transferring to:

- Rutgers Landscape Architectural Program
- Delaware Valley University Plant Science Program
- Other Colleges or Universities

Several colleges in the area have programs that lead into a Bachelor's degree; Rutgers University, Delaware Valley University, Penn State University, University of Maryland. There are transfer agreements with Rutgers and Delaware Valley. PSU and UMD could be contacted regarding appropriate transfer classes, and other colleges/universities could be contacted for similar options.

Professional Status:

- Attained Professional Status in Floral Design
- Attained Professional Status in Horticultural Therapy

Other:

- Used for Personal Enrichment for Non-degree Students

Generally most students have some familiarity with the plant-related professions in Horticulture. What many don't realize is what competencies are necessary to make it a career. *These are clearly stated and researched by students in the poster presentation they are required to do for the HRT 101 Fundamentals of Horticulture course.*



Trade Show Booth with BCC Student, Sydney Weyl

FACULTY OUTREACH

Marketing the Program: Faculty, staff and the Advisory Board actively seek out ways to market the program to potential students.

- Association and Trade Shows: *A major marketing effort is via the NJLCA and trade show exhibitions. Each spring BCC faculty, staff and students set up and maintain a booth at the NJLCA. There we reunite with alumni, industry leaders and potential students for the program.*
- Open Houses and Major Fairs: *Faculty and staff are present at all Open House and Major Fair sessions the college invites potential students to attend.*
- Facility Tours: *At parent and student requests we offer individual tours of our facilities and provide career counseling to potential students.*
- Brochures: *We have a series of brochures that were developed by Mr. Paul Keyes, a former adjunct faculty and Advisory Board member, distributed throughout the BCC campus at events and on bulletin boards.*
- Website: *The Horticulture Program, as part of the Biology & Horticulture Department, has an online web presence on Bergen Community College website. This highlights our programs by providing 24/7 access to information from anywhere.*



NJLCA Trade Show Booth Garden

Improving Student Achievement:

- Skill Development: *Professor Wiles Research Based Professional Development (RBPD), “Scientific Discovery Relating to Improved Performance and Group Cohesiveness” focused on encouraging students to develop a command of their observational skills of plants in nature via writing across the curriculum.*
- Extra Credit: *Offering of extra credit projects and assignments to students that want to do better.*
- Original Research: *Encouraging students to conduct novel research experiments with plants utilizing the college greenhouse facility.*
- Replicated Research: *Students are given the opportunity to utilize college facilities for replicated research projects in courses like Plant Propagation, Pests of Ornamental Plants, Plants & Materials II, Plant Science, Fundamentals of Horticulture, People-Plant Relationships, General Botany, and more.*
- Accommodations: *Assisting ESL and other needy students with course materials via extended time for class tests and other class accommodations.*

Student Leadership Development:

- New Course: *Creation of a new 200 level General Education Biology course (BIO-217) “Sustainability in Nature.” This course is approved in New Jersey as a new General Education course for Science, Ethical Reasoning and Information Literacy.*
- Grow-to-sale Experience: *Activities sponsored by the program are driven by student support to design, grow and sell commercially produced products including: floral and greens arrangements, orchids, annual and perennial plants, etc.)*
- Off-campus Field Trips: *Students are exposed to numerous off-campus educational opportunities to see and learn from leading business people in Horticulture (wholesale and retail florists, growers, landscape contractors, garden centers, etc.)*

Advising and Guidance:

- Advising: *Students have Professor Linda Wiles as the Advisor for Horticultural Studies. Dr. Fischer also assists as he has done for 40 years at BCC as a Career Counselor.*
- Guidance: *Students are required to research and report on a career and employment position of interest (Arboriculture, Landscape Contractor, Landscape Designer, Landscape Architect, Florist, Nurseryman, etc.)*

DEMOGRAPHICS

All students at Bergen Community College can join the Horticulture program; there are no special admission standards. *The program encourages a respectful atmosphere for all and encourages student-faculty rapport.* We have both women and men of diverse backgrounds, some typical college age spanning the years to others who are starting second careers later in life. There are students of wide ethnic and racial backgrounds, both native-born and foreign nationals.

Number of Declared Majors by Career Program

Career Program Name	Reporting Code	# Majors 2012	# Majors 2013	# Majors 2014	# Majors 2015	# Majors 2016
Horticulture	AAS.ST.HORT	17	16	16	18	22
Landscape/Design/Build	AAS.ST.LAND	19	12	8	10	13
Floral Design	CERT.FLORAL	5	1	2	---	3
Grounds Management	CERT.GRND.MGT	1	2	1	---	---
Landscaping	CERT.LAND	8	3	3	1	2

Overview, the 5 year change of declared majors for the Horticulture AAS is a 29% increase; for Landscape/Design/Build AAS is a 32% decrease. The overall trend is up over the past three years for both AAS degrees.

Number of Degrees and Certificates Awarded

Degrees/Certificates Awarded	Reporting Code	# 2012	# 2013	# 2014	# 2015	# 2016	5 yr. Totals
Horticulture	AAS.ST.HORT	7	3	7	4	5	26
Landscape/Design/Build	AAS.ST.LAND	---	---	3	---	---	3
Floral Design	CERT.FLORAL	---	1	---	---	1	2
Grounds Management	CERT.GRND.MGT.	1	---	---	---	---	1
Landscaping	CERT.LAND	---	1	---	---	---	1

Total for 5 years AAS Degrees – 26

Total for 5 years Certificates - 4

Adapted from source: Bergen Community College Fact Book 2016-2017 Preliminary, BCC Center for Institutional Effectiveness, <http://bergen.edu/wp-content/uploads/IR-2016-2017-Fact-Book-Preliminary.pdf> (5/15/2017 access) □

HORTICULTURE DEGREES AND CERTIFICATES AWARDED

MAY 2012 THROUGH MAY 2017

AAS.ST.HORT - 29 + 1 dual = 30

AAS.ST.LAND - 3

CERT.FLORAL - 2

CERT.GRND.MGT - 1

CERT.LAND - 1 dual

35 subtotal + 2 = 37 total

We are reviewing the possibility of expanding completion rates as well as providing additional certification options for students. This would be via advising them on completing a Certificate first, then planning to complete an AAS degree.

Graduation date (May, August, December) - did not seem to be a major factor for completion of course work for Horticulture degrees and certificates.

May - 17 + 2 dual = 19

December - 12

August - 6

Source: Analysis based on BCC Center for Institutional Effectiveness Excel spreadsheet



Students Working on the BCC Landscape

DEGREES AND CERTIFICATES

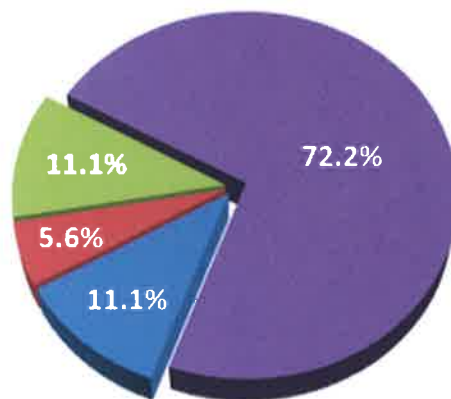
AAS.ST.HORT OVERVIEW

We have both full-time and part-time students, with a large proportion as part-time due to the student's requirements. Many of our students work full-time, with a number of them entrepreneurial in their own horticulture businesses. *For this reason it is important that we keep in contact with our former students who have not yet completed their program. They are a dedicated group and sometimes take several years to complete a degree.*

The BCC Horticulture AAS.ST.HORT Program Dashboard is the source of the following information.

AAS.ST.HORT

Enrollment by Registration Type
Fall 2015



■ First-Time* ■ Transfer** ■ Stop-out*** ■ Returning****

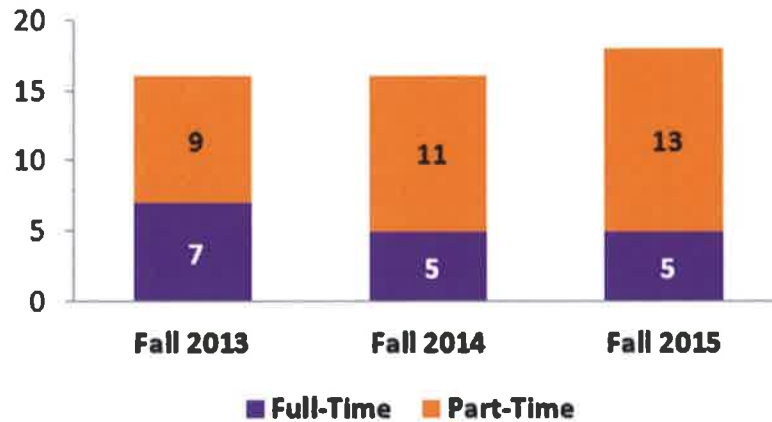
*New to college **New to Bergen (originally enrolled at different institution)

Not enrolled in previous semester *Enrolled in previous semester

Source: SURE Enrollment File

Enrollment by Attendance

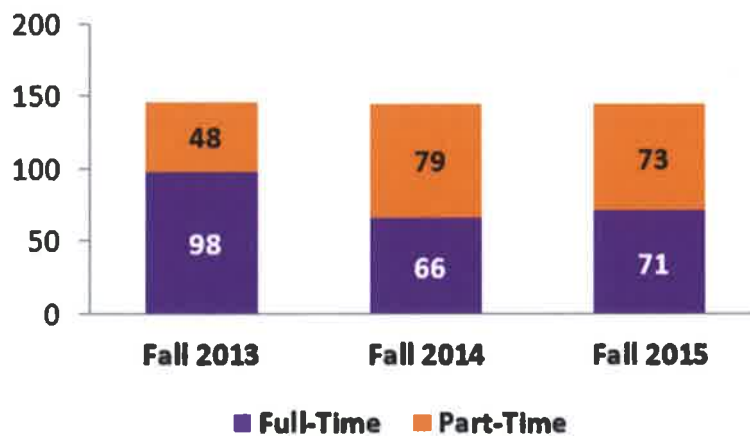
Student Status	Fall 2013	Fall 2014	Fall 2015
Full-Time	7	5	5
Part-Time	9	11	13
TOTAL	16	16	18



Source: SURE Enrollment File

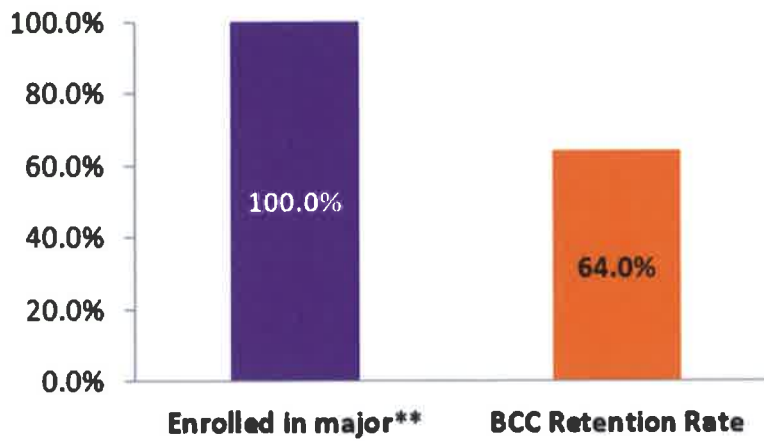
Credits Enrolled by Attendance

Student Status	Fall 2013	Fall 2014	Fall 2015
Full-Time	98	66	71
Part-Time	48	79	73
TOTAL	146	145	144



Source: SURE Enrollment File

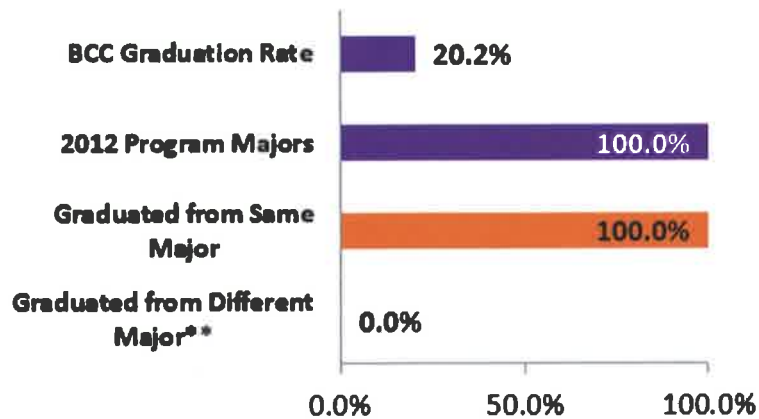
One-Year Retention, FTFTDS*, Fall 2014



*One-Year Retention Rate includes First-Time, Full-Time, Degree-Seeking Students in Fall 2014 who re-enrolled at BCC in Fall 2015. **Students who were First-Time, Full-Time and enrolled in major in Fall 2014 and re-enrolled at BCC in Fall 2015.

Source: SURE Enrollment File

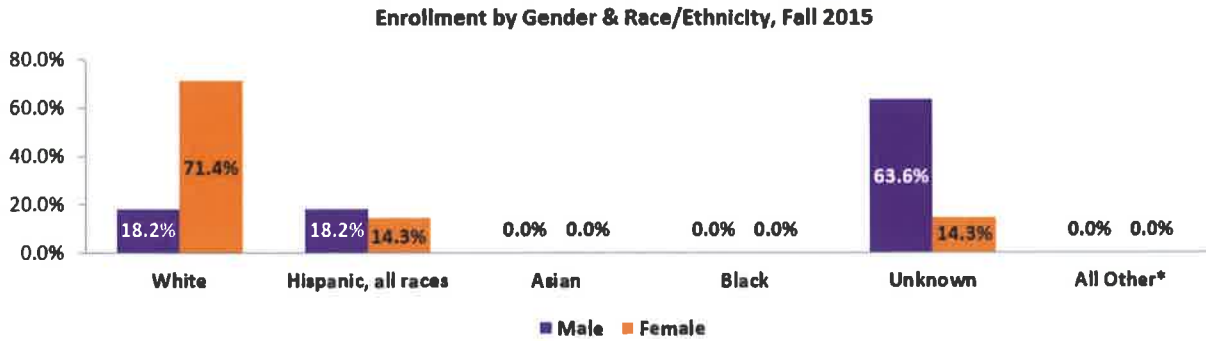
Graduation Rates, FTFTDS*, Fall 2012



*Graduation Rates based on First-Time, Full-Time, Degree-Seeking Students who started at BCC in Fall 2012 and graduated within 3 years (150%).

**Most popular major(s) graduated from: No Graduates from Different Major.

Source: IPEDS Graduation Rates Survey



*All Other category includes American Indian/Alaskan Natives, Hawaiian/Pacific Islanders, Non-Resident Aliens and students who reported two or more races.

Source: SURE Enrollment File

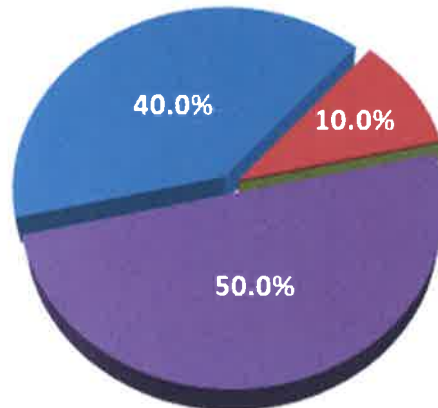
Student self-reporting of race/ethnicity/gender is generally down overall, both for Horticulture and BCC as indicated in the “Bergen-at-a-Glance 2016-2017” report with 25.1% unknown. This is optional reporting. *Due to this, the validity of using the existing data to draw conclusions is questionable. As a general observation, an increasing number of students in our program are of mixed ancestry (self-identified in conversations) with both male and female students represented.*

DEGREES AND CERTIFICATES

AAS.ST.LAND OVERVIEW

The BCC Horticulture AAS.ST.LAND Program Dashboard is the source of the following information.

Enrollment by Registration Type
Fall 2015



■ First-Time* ■ Transfer** ■ Stop-out*** ■ Returning****

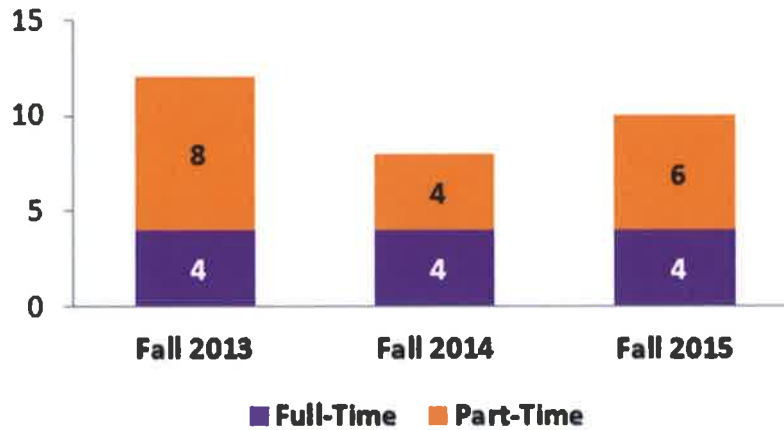
**New to college **New to Bergen (originally enrolled at different institution)*

****Not enrolled in previous semester ****Enrolled in previous semester*

Source: SURE Enrollment File

Enrollment by Attendance

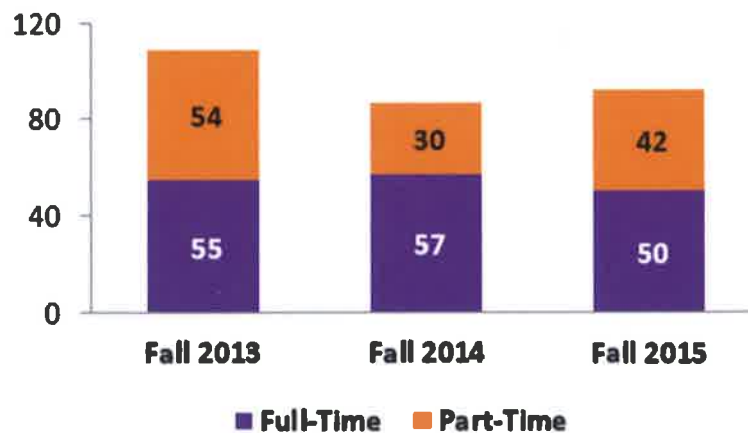
Student Status	Fall 2013	Fall 2014	Fall 2015
Full-Time	4	4	4
Part-Time	8	4	6
TOTAL	12	8	10



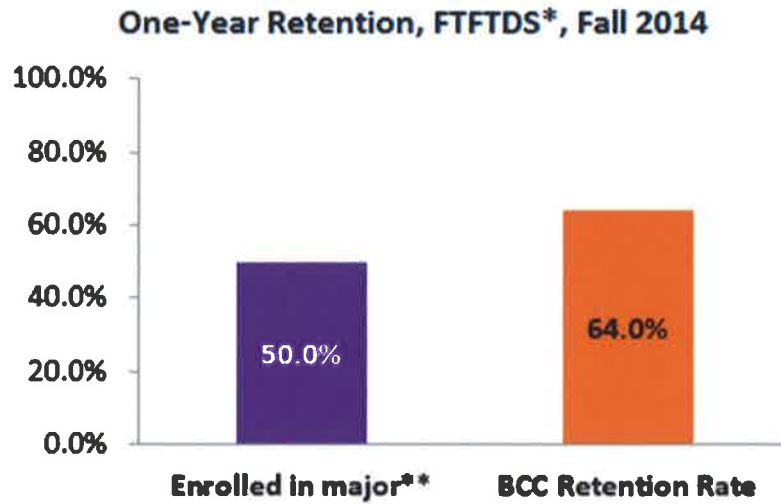
Source: SURE Enrollment File

Credits Enrolled by Attendance

Student Status	Fall 2013	Fall 2014	Fall 2015
Full-Time	55	57	50
Part-Time	54	30	42
TOTAL	109	87	92

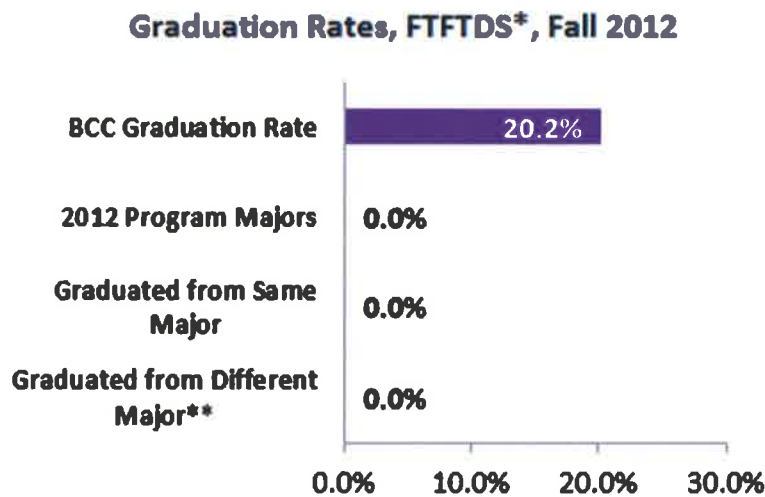


Source: SURE Enrollment File



**One-Year Retention Rate includes First-Time, Full-Time, Degree-Seeking Students in Fall 2014 who re-enrolled at BCC in Fall 2015. **Students who were First-Time, Full-Time and enrolled in major in Fall 2014 and re-enrolled at BCC in Fall 2015.*

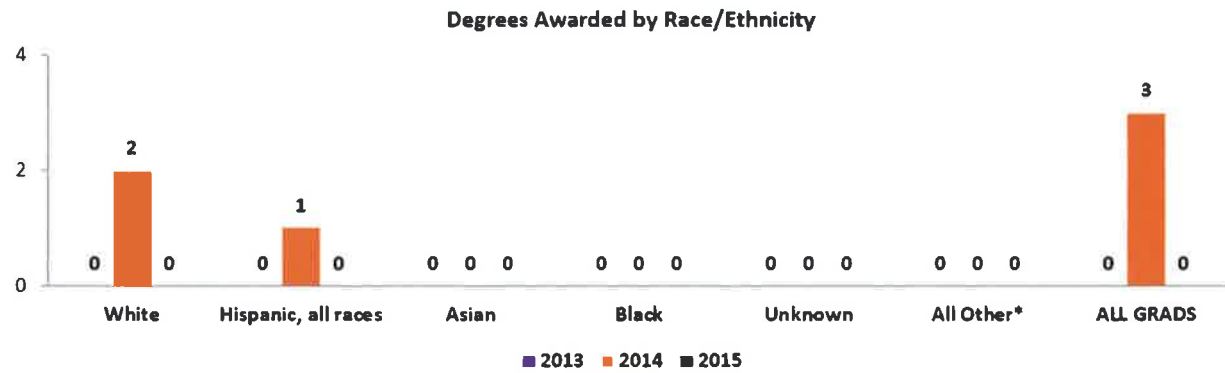
Source: SURE Enrollment File



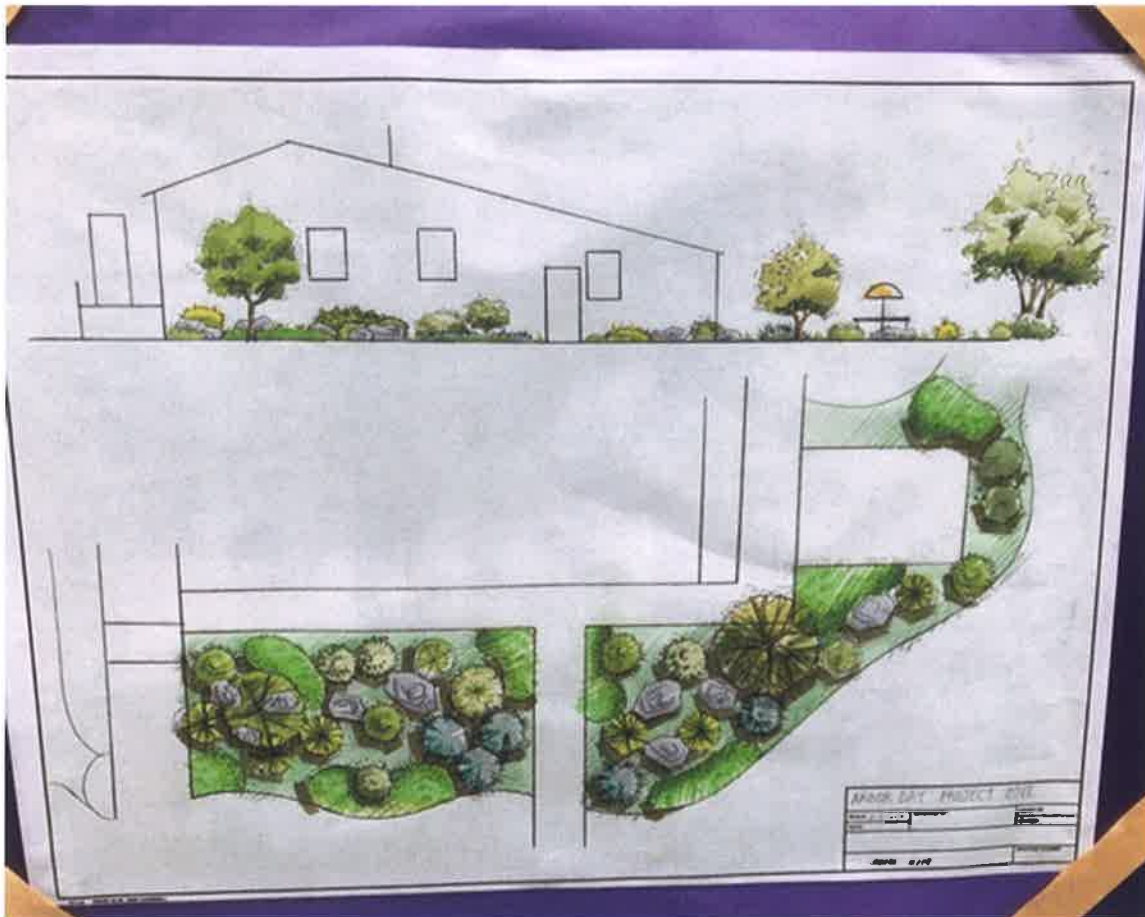
**Graduation Rates based on First-Time, Full-Time, Degree-Seeking Students who started at BCC in Fall 2012 and graduated within 3 years (150%).*

***Most popular major(s) graduated from: No Graduates from Different Major.*

Source: IPEDS Graduation Rates Survey



*All Other category includes American Indian/Alaskan Natives, Hawaiian/Pacific Islanders, Non-Resident Aliens and students who reported two or more races.
Source: SURE Degrees Awarded File



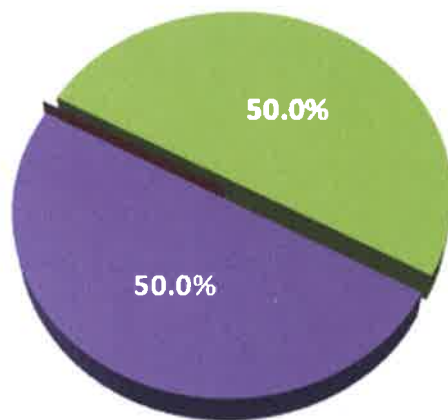
Student, Sumi Kim, Landscape Design

DEGREES AND CERTIFICATES

CERT.FLORAL

The Floral Certificate is a small but important program. We have students interested in pursuing this that often change to a full AAS degree program. It is being revitalized in a target group of older students, often with other college degrees who find a second career in working with plants. Their focus is on working and taking classes, sometimes at the same time with breaks from classes as their schedules require.

Enrollment by Registration Type
Fall 2014



■ First-Time* ■ Transfer** ■ Stop-out*** ■ Returning****

**New to college **New to Bergen (originally enrolled at different institution)*

****Not enrolled in previous semester ****Enrolled in previous semester*

Source: SURE Enrollment File



DEGREES AND CERTIFICATES

CERT.GRND.MGT

The Grounds Management Certificate is one which is being proposed to combine with the Landscape Certificate to better serve potential students.

Enrollment by Registration Type Fall 2014



■ First-Time* ■ Transfer** ■ Stop-out*** ■ Returning****

*New to college **New to Bergen (originally enrolled at different institution)

Not enrolled in previous semester *Enrolled in previous semester

Source: SURE Enrollment File



DEGREES AND CERTIFICATES

CERT.LAND

Both the Landscaping and Grounds Certificates have a large group of potential students that would benefit from the classes and both also have many students already working at least part-time in the industry. These students use the flexibility of the programs to register for classes as their workload permits.

Enrollment by Registration Type

Fall 2015



■ First-Time* ■ Transfer** ■ Stop-out*** ■ Returning****

*New to college **New to Bergen (originally enrolled at different institution)

Not enrolled in previous semester *Enrolled in previous semester

Source: SURE Enrollment File



Flowering Rhododendron in Landscape

FOCUS ON FACULTY/STAFF

Since the last Program Review the following changes have been made in the faculty and staff:

Faculty: Professor Linda Wiles was awarded tenure in 2017. She replaced the retiring Professor Susan Gruben in 2012.

Technical Staff: Technical Assistant Garrett Planten replaced Fran Ruff who moved into the Early Childhood Program in 2009.

Staff: Secretarial support staff includes Marie Notholt and Judy Jouan.

Marie Notholt is the Department of Biology and Horticulture's only secretary and she also serves as the department secretary for the Physical Sciences. Marie expertly and very graciously handles secretarial, clerical and support assistance for budget and faculty evaluations.

Horticulture occasionally has assistance in Ender Hall from Judy Jouan, the secretary who previously covered all of Ender Hall, on a time available basis. However, she has recently been transferred to the Adjunct Office and only has limited availability currently.

Current Adjunct Faculty: Mark Borst, Jackie Dartley, Bob DeRosa, Nick Groetsma, Chris Raimondi, Dawn Rohsler, Ted Szczawinski.

In Spring 2017, Dr. Fischer added HRT 204, Landscape Graphics to the courses he has taught in the program, with thanks to guest lecturers, including some former students. Courses under his direction are: Fundamentals of Horticulture, Turf & Grounds Management, Floral Design, Landscape Design, Landscape Plants and Materials I, Landscape Plants and Materials II, Landscape Site and Plan Analysis, Horticulture Co-Op Work Experience and People-Plant Relationships.

Professor Wiles has assumed a teaching role in the Biology/Horticulture Program. Courses under her direction are: Plant Science, Pests of Ornamental Plants, Horticulture Marketing & Sales, Plant Propagation, General Botany and Sustainability in Nature. In addition to these, she also teaches People-Plant Relationships, General Biology I, and sometimes co-teaches Fundamentals of Horticulture with Dr. Fischer.

The team effort from Garrett Planten, the Horticulture Technical Assistant, has given great visibility for both campus and community events sponsored by the program. Some of his responsibilities include requisitions, inventory, maintenance and scheduling. Garrett's extraordinary rapport with students, faculty, staff and administrators is one of our strongest assets as we reach into the next decade of Horticultural education at BCC. The scheduling of volunteers, work study students and STEM grant recipients by Garrett is time consuming, but is a highly productive service to the students as well as to the program.

Adjunct Professor Bob DeRosa has continued to teach our Summer U semester Landscape Contracting (2016) alternating with Turf and Grounds Management (2017) for many years. Dr. Fischer regularly teaches Co-Op for Horticulture in Summer U.

Adjunct Professor Chris Raimondi contributed a large donation of orchid plants from his business, Raimondi Horticultural that enabled the Horticulture program to hold a Spring 2017 Orchid Sale to benefit scholarships in Horticulture.

Appendices include the Curriculum Vitae of both Dr. Steve Fischer and Professor Linda Wiles.

GENERAL EDUCATION BIOLOGY COURSES

TAUGHT BY HORTICULTURE FACULTY

We have three General Education Biology courses under the direction of the Horticulture faculty, BIO-130, People-Plant Relationships, BIO-131, General Botany, and BIO-217, Sustainability in Nature.

From Spring 2012-Spring 2017 data provided by BCC Center for Institutional Effectiveness:

BIO-130 People-Plant Relationships

By school year, Fall through Summer:

2012-2013 – 140 students

2013-2014 – 186 students

2014-2015 – 271 students

2015-2016 – 152 students

2016-2017 – 183 students (est. for summer 2017 included)

This gives a total of 940 students: mean of 188 students/year; range of 140-271 students/year.

Breakout by semester:

Fall semester – mean 72 students; range 49-128 students

Spring semester – mean 47 students; range 25-95 students

Summer classes - mean 38 students; range 23-48 students

Based on this, an optimum would be to offer 3 fall, 2 spring and 3 summer classes.

BIO-131 General Botany

By school year, Fall through Summer:

2012-2013 – 94 students

2013-2014 – 91 students

2014-2015 – 85 students

2015-2016 – 94 students

2016-2017 – 46 students

This gives a total of 468 students: mean of 93.6 students/year; range of 46-94 students/year.

Breakout by semester:

Fall semester – mean 35.8 students; range 24-49 students

Spring semester – mean 32.4 students; range 22-46 students

Summer classes - mean 13.0 students; range 2-14 students

Based on this, an optimum would be to offer 2 fall and 1 or 2 spring classes, with an optional summer class based on student interest.

BIO-217 Sustainability in Nature

This is a new course that is being offered in Fall 2017. It is meant as an expansion of BIO-130, People-Plant Relationships, with a focus on developing a sustainable environment.

FOCUS ON CURRICULUM

Curriculum work has been very intense over the past four years. The Horticulture Curriculum Maps were developed in October 2013. Horticulture Syllabi were edited and posted in Summer 2015. The program consolidation in progress, as noted in the Appendices is in consultation with the BCC Administration, Horticulture Advisory Board and in line with student needs.

The Horticulture Advisory Board plays a major role in the direction our students have and will continue to be trained. Many changes have occurred since the first courses were offered in 1975, yet the core courses have served, and will always serve, our students with entry level skills.

Career Technologies AAS – Science Technology, Horticulture Degree

Code: AAS.ST.HORT

The two-year Horticulture option prepares students for employment in horticulture based on hands-on training in a wide range of topics that can lead directly to employment in horticulture or to a four-year program. Topics include science, art and business aspects such as: plant science, propagation, turf, pests, design, marketing, plant materials, etc.

Program Learning Outcomes

- Describe and demonstrate the elements and principles of design utilized for a landscape site.
- Conduct an analysis of the environmental concerns for good plant growth at an interior and/or exterior landscaped site.
- Coordinate the process of preparing a plan, specifying materials to be used and the installation of those materials on a landscaped site.
- Prescribe the “Best Horticultural Practices” for a wide variety of interior and exterior plant materials used in the ornamental industries.
- Demonstrate the materials and methods used for the propagation of a wide variety of ornamental crops.
- Discuss the anatomy and physiology of a plant at an industry-needs level.
- Identify the biotic and abiotic problems associated with the maintenance of a wide range of interior and exterior plant materials used in the ornamental industries.
- Collect a soil sample for analysis of the structure, texture, pH and nutrient content so a determination can be made to add amendments to the soil or to apply a chemical treatment.
- Discuss the marketing and sale of the aesthetic and environmentally achieved results of a design.

Career Pathways: Garden Center Manager, Grounds Management Supervisor, Parks Department Crew Chief, Staff Horticulturist, Sales Technician for Hort. Supplies

Recommended Class Schedule: Ornamental Horticulture A.A.S. Degree

First Semester

HRT-101	Fundamentals of Horticulture	3 credits
HRT-102	Plant Science	4 credits
HRT-104	Landscape Plants and Materials I	2 credits
BIO-130	People- Plant Relationships	4 credits
WRT-101	English Composition I	3 credits
Total credit hours		16

Second Semester

HRT-120	Interior Plantscaping	3 credits
HRT-232	Plant Propagation	4 credits
HRT-233	Landscape Plants & Materials II	4 credits
WRT-201	English Composition II	3 credits
	Gen. Ed. Social Science elective	3 credits
Total credit hours		17

Third Semester

HRT-103	Turf and Grounds Management	3 credits
HRT-112	Pests and the Ornamental Plant	4 credits
HRT-204	Landscape Graphics	2 credits
HRT-236	Horticulture Marketing & Sales	3 credits
BIO-108	Introduction to Environmental Biology	4 credits
Total credit hours		16

Fourth Semester

HRT	Restricted HRT elective	3-4 credits
	Gen. Ed. Humanities Elective	3 credits
BUS-101	Introduction to Business	3 credits
HRT-113	Principles of Landscaping	3 credits
HRT-292	Co-Op Work Experience [Horticulture]	2 credits
Total credit hours		15-16

A.A.S. Horticulture – 64-65 credits

Restricted HRT Electives

- HRT-115 – Floral Design
- HRT-119 – Greenhouse Operations and Production
- HRT-235 – Landscape Analysis
- HRT-237 – Arboriculture and Plant Health Care

Floral Design Certificate [35 credits]
Code: CERT.FLORAL

Students taking the Floral Design Certificate are exposed to the materials and creative processes of the florist and interior landscaping industries. The role that both the physical and environmental setting has on the elements of design (color, texture and form) and aesthetic considerations are dealt with in laboratory and lecture projects.

Program Learning Outcomes

- Identify the commonly used cut flowers, greens and supplies used in the floral industry.
- Identify the common tropical plants and holiday plants used in the floral industry.
- Construct the basic designs (e.g. centerpieces, arrangements, corsages etc.) for holiday and special events.
- Discuss and demonstrate the elements and principles of design used by the floral industry.
- Handle and process cut flowers and greens under accepted industry practices.

Recommended Class Schedule: Floral Design Certificate

First Semester

HRT-102	Plant Science	4 credits
HRT-115	Floral Design	3 credits
HRT-232	Plant Propagation	4 credits
WRT-101	English Composition I	3 credits
Total credit hours		17

Second Semester

	Business elective (ACC, BUS or INF)	3 credits
	Gen. Ed. elective	3 credits
HRT-119	Greenhouse Operations and Production	3 credits
HRT-120	Interior Plantscaping	3 credits
HRT-234	Comm. Floral Design Management	4 credits
HRT-292	Co-Op Work Experience [Horticulture]	2 credits
Total credit hours		18

Career Technologies A.A.S. – Science Technology, Horticulture – Landscape/Design/Build Option Degree

Code: AAS.ST.LAND

The two-year Landscape/Design/Build option provides students with a set of knowledge, skills and abilities that prepares them for direct employment in the landscape design field. It includes sustainable design and construction, management and development of presentation skills.

Program Learning Outcomes

- Describe a site analysis of a new or existing landscape and evaluate the removal or transplanting of existing plant materials.
- Prepare a conceptual, preliminary and final copy plan complete with a detailed Plant Materials List, Construction Materials to be used and the Order of Occurrence for implementation of the design.
- Develop a budget for each phase of project and propose a payment plan for project.
- Explain in detail the materials and methods to be used with both plant and construction materials.

Career Pathways: Landscape Contractor, Landscape Designer, Landscape Project Manager, Technical Marketing, Sales of Landscape Products/Services



Students Working on the
Ender Hall Landscape

Recommended Class Schedule: Landscape/Design/Build A.A.S. Degree

First Semester

HRT-102	Plant Science	4 credits
HRT-104	Landscape Plants and Materials I	2 credits
HRT-113	Principles of Landscaping	3 credits
BIO-130	People-Plant Relationships	4 credits
WRT-101	English Composition I	3 credits
Total credit hours		16

Second Semester

	Social Science Elective	3 credits
HRT-204	Landscape Graphics	2 credits
HRT-233	Landscape Plants and Materials II	4 credits
HRT-235	Landscape Analysis	3 credits
WRT-201	English Composition II	3 credits
Total credit hours		15

Summer Semester

HRT-130	Landscape Contracting	1 credit
HRT-292	Co-Op Work Experience [Horticulture]	2 credits
Total credit hours		3

Third Semester

	Humanities elective	3 credits
BIO-108	Introduction to Environmental Biology	4 credits
HRT-103	Turf and Grounds Management	3 credits
HRT-114	Computer App. for Landscape Design	3 credits
HRT-213	Sustainable Design and Construction	3 credits
Total credit hours		16

Fourth Semester

HRT	Restricted HRT elective	3-4 credits
HRT-214	Landscape Design and Building Capstone	3 credits
HRT-215	Landscape Design and Building Mgmt.	3 credits
HRT-236	Horticulture Marketing and Sales	3 credits
Total credit hours		13-14

A.A.S. Landscape/Design/Build – 63-64 credits

Restricted HRT Electives

- HRT-115 – Floral Design
- HRT-119 – Greenhouse Operations and Production
- HRT-237 – Arboriculture and Plant Health Care

Grounds Management Certificate [30-36 credits]

Code: CERT.GRND.MGT

The student of our Grounds Management Certificate understands the function of various plant types (e.g. grasses, shrubs, trees, herbaceous plants) and the cultural needs of these for sustainably dealing with soils, water, fertilizer, pruning, pest control, planting and more. A hands-on educational approach is given to each student with designed projects for them to fulfill on campus.

Program Learning Outcomes

- Identify the major insect, disease, nutritional and physiological disorders that effect plant growth.
- Conduct a site analysis of the existing and potential problems to the plants and surrounding items and areas.
- Take a soil sample and remedy any deficiencies, abnormal pH levels or nutritional concerns
- Manage the turf area for weeds, insects, diseases and nutrient needs.
- Consult on pruning practices appropriate for shrub and tree care.
- Coordinate sub-contracted services necessary to the site.

Recommended Class Schedule: Grounds Management Certificate

First Semester

HRT-102	Plant Science	4 credits
HRT-103	Turf and Grounds Management	3 credits
HRT-104	Landscape Plants and Materials I	2 credits
HRT-112	Pests and the Ornamental Plant	4 credits
HRT-130	Landscape Contracting	1 credit
WRT-101	English Composition I	3 credits
Total credit hours		17

Second Semester

HRT	Restricted elective	2-4 credits
	Gen. Ed. elective	3 credits
HRT-124	Irrigation Technology	2 credits
HRT-125	Equipment Management	2 credits
HRT-235	Landscape Analysis	3 credits
HRT-237	Arboriculture and Plant Healthcare	3 credits
Total credit hours		15-17

Restricted HRT Electives

HRT-115 – Floral Design

HRT-119 – Greenhouse Operations and Production

Landscaping Certificate [35-36 credits]

Code: CERT.LAND

Students enrolled in the Landscape Certificate are exposed to the plants and construction materials utilized to transform a new or existing site for functional and/or aesthetic needs. Students study a site, prepare a plan, and implement a project on campus as one of the laboratory components. They demonstrate the design principles they have learned to resolve problems in the everyday world of landscaping (drainage, topography, exposure, sustainability, etc.).

Program Learning Outcomes

- Conduct a Site Analysis and Family Inventory Analysis for a residential landscape site.
- Identify and propose solutions to the drainage and site problems that need to be rectified by the design.
- Develop conceptual, preliminary and final copy plans for the site.
- Formulate a functional and/or aesthetic group of plants and materials that best suits the environment and the client's needs.
- Organize the various phases of implementing the design, from permits to final inspections.

Recommended Class Schedule: Landscaping Certificate

First Semester

BUS-101	Introduction to Business	3 credits
DFT-107	Drafting I	2 credits
HRT-103	Turf and Grounds Management	3 credits
HRT-130	Landscape Contracting	1 credit
WRT-101	English Composition I	3 credits
Total credit hours		17-18

Second Semester

	Gen. Ed. elective	3 credits
HRT-113	Principles of Landscaping	3 credits
HRT-204	Landscape Graphics	2 credits
HRT-233	Landscape Plants and Materials II	4 credits
HRT-235	Landscape Analysis	3 credits
INF-101	Introduction to Information Technology	3 credits
Total credit hours		18

FOCUS ON CURRICULUM – HORTICULTURE COURSE SCHEDULING

HISTORY, STATISTICS & ANALYSIS

Spring 2012-Spring 2017

Classes are offered based on semester to accommodate plant material availability, sequential learning and instructor availability. These are the basic patterns from Spring 2012-2017 with data analyzed from BCC Center for Institutional Effectiveness spreadsheet and presented with analysis in the three charts below.

Fall Courses

Course #	Course	# Classes	Registration Per Class (range)	Total Students
HRT-101	Fundamentals of Horticulture	5 (each year)	10-17	68
HRT-104	Plants & Materials I	5 (each year, 1-2 sections)	11-38	131
HRT-112	Pests of Ornamental Plants	3 (alternate yrs.)	7-21	36
HRT-236	Horticulture Marketing & Sales	3 (alternate yrs.)	12-16	43
HRT-114	Computer App. of Landscape Design	2 (as requested)	11-13	24
HRT-119	Greenhouse Operation & Prod.	1 (last Fall 2016)	21	21
HRT-213	Sustainable Design & Construction	1 (as requested)	9	9
HRT-237	Arboriculture & Plant Health Care	1 (next F 2018)	14	14

In recent years we have been able to offer courses that have not been available for some time. A prime example of this is HRT-119, Greenhouse Operation & Production, which was held last Fall 2016 semester with the class filling to 21 students.

Several of these courses (HRT-104, 112, 236, 237) have significant potential to expand to the general landscape industry as single class selections for non-degree students.

HRT-101, Fundamentals of Horticulture, is a very good entry point for students coming into the Horticulture program and is also used by students as a general interest elective.

Spring Courses

Course #	Course	# Classes	Registration Per Class (range)	Total Students
HRT-102	Plant Science	5 (each year)	10-24	77
HRT-113	Principles of Landscaping	6 (each year)	8-16	71
HRT-115	Floral Design	6 (each year)	10-20	103
HRT-232	Plant Propagation	4 (alternate years, next SP 2018)	8-15	50
HRT-233	Plants & Materials II	5 (each year)	10-17	67
HRT-234	Floral Design Management	6 (each year); alongside HRT-115	2-5	16
HRT-124	Irrigation Technology	1 (as requested)	13	13
HRT-125	Equipment Management	2 (last Spring 2017)	7-11	18
HRT-204	Landscape Graphics	2 (last Spring 2017)	9-16	25
HRT-214	Landscape Design Build Capstone	1 (as requested)	8	8
HRT-215	Landscape Design Build Mgmt.	1 (as requested)	11	11

Spring semester also provided a prime example of increased interest, HRT-204, Landscape Graphics, which was held in Spring 2017 semester with a class of 16 students.

Two of these spring courses (HRT-232 and 233) have significant potential to expand to the general landscape industry as single class selections for non-degree students.

HRT-102, Plant Science, is a very good entry point for students coming into the Horticulture program. Another very good entry point for Horticulture, HRT 115, Floral Design, is also a strong general interest elective.

Summer Courses

Course #	Course	# Classes	Registration Per Class (range)	Total Students
HRT-103	Turf & Grounds Management	2 (alternate years; + current Su 2017)	11-13	24
HRT-120	Interior Plantscaping	4 (spring, fall or summer offerings)	11-21	64
HRT-130	Landscape Contracting	2 (alternate years; next Su 2018)	8-12	20
HRT-235	Landscape Analysis	1 (as requested)	11	11
HRT-292 (462)	Co-Op Work Experience	4 (each year)	2-19	39

Our students have substantial interest in taking summer evening classes which we provide on an annual, alternate, or on request basis. Bob DeRosa, one of our Advisory Board members and adjunct faculty, provides HRT-103 and HRT-130, on alternate years. We are also fortunate to have Chris Raimondi (both Advisory Board and adjunct faculty as well) provide HRT-120 in summer, fall or spring semesters. Co-Op is offered annually in the summer and is taught by Dr. Fischer. It is a key opportunity for students to both prepare for the workforce and also the potential of a job with their Co-Op organization.

LIBRARY RESOURCES

The BCC Horticulture faculty and staff are strong proponents of the need for Information Literacy and are avid collectors of books and reference materials personally and professionally. We have the greatest admiration and respect for the professionalism and knowledge of the BCC Library faculty/staff.

We are very fortunate that the BCC Library has extensive resources for students and faculty to access applicable to Horticulture and/or the plant related Biology sections that we teach.

The Excel files of library holdings which Professor Edith Sirianni provided the following data:

LIBRARY APPENDIX 1: Electronic and Hard Copy Materials

- 619 E-books – strong holdings in Botany, Horticulture, Pests and Ecology/Sustainability
- 618 books – reference and circulation – also very good representation for the above topics
- 19 DVDs – three with plant focus
- 10 Online Videos – all Horticulture related
- 2 periodicals – both Horticulture

LIBRARY APPENDIX 2: Classes Provided by the Librarian

There are thirteen courses represented in the Biology and Horticulture Department. The following are used by our students:

- BIO 101- Literature Search and Format Comparison - Lab Assignment (Wiles, for student reference, not as a class, for our regular Biology or Horticulture classes)
- BIO 130 People-Plant Relationships
- BIO 131 Botany (Plant Families, Plant Profiles, Biomes)
- HRT 102 Plant Science
- HRT 236 Horticulture Marketing & Sales
- HRT-119 Greenhouse Operation and Production
- HRT-232 Plant Propagation

LIBRARY APPENDIX 3: Online Library Guide Usage – January 1, 2015 – November 29, 2016

Guide ID	Guide Name	Views
123093	BIO 130 People-Plant Relationships	2287
123090	BIO 131 Botany (Plant Families, Plant Profiles, Biomes)	1132
123101	BIO 101- Literature Search and Format Comparison - Lab Assignment	562
123160	HRT 236 Horticulture Marketing & Sales	489
221441	HRT-232 Plant Propagation	417
123096	HRT 102 Plant Science	234
528395	HRT-119 Greenhouse Operation and Production	118

The following section is provided by Professor Edith Sirianni. Bolded areas indicate the wonderful resources that the Horticulture section has been provided via the Perkins Grant and access to journals is noted with our thanks.

LIBRARY SUPPORT– BIOLOGY and HORTICULTURE

The Bergen Community College Libraries provide resources for biology and horticulture faculty and students including print and e-books, science journals and media. When possible, electronic formats are purchased because they are accessible from classrooms and laboratories and off-campus. A list of recent (5 years) library acquisitions in biology and horticulture can be found in

Appendix 1.

Library materials are located by using the online catalog. E-Books and streaming media can be viewed directly from the online catalog, on or off campus. In addition, library materials in support of Biology and Horticulture can also be found in the following subject areas: Technology (Includes environmental technology and engineering); Home Economics (Includes food and nutrition); Medicine (Useful for Human Body, Human Biology, Human Anatomy and Physiology, etc.); and Geography (Includes Human ecology.) Materials may be borrowed from either campus and are delivered to the BCC libraries twice a day from Monday through Friday.

Library acquisitions, including titles in support of specific topics and new courses, may be recommended by faculty and previewed if necessary with the assistance of the library liaison. The goal is to insure that the collection will be up-to-date and support student research and projects as well as faculty teaching, general interest and reference. (See [Appendix 1](#) for acquisitions in the past 5 years.)

Library instruction is available and can be scheduled by faculty by using the online request form. During library instruction classes, information literacy concepts are presented along with specific

library resources in Biology and Horticulture. The Library Liaison and the faculty work together to insure that the students will have the necessary resources available for their research assignments and class presentations. The variety of Library instruction classes taught in Biology and Horticulture can be found in [Appendix 2](#).

Online library research guides (Libguides) have been developed for many of the biology and horticulture courses. These guides, available from the Library Home Page, provide links to important resources for student research in Biology and Horticulture. A list of Libguides and the usage statistics can be found in [Appendix 3](#).

Course Textbooks and required readings are available on reserve for student use in the library. The library attempts to purchase at least one print copy of every textbook used at BCC. The Reserve platform is available for classroom support materials. In compliance with Copyright laws, E-reserves require authentication for access. Professors may request print reserves and e-reserves by contacting the E-reserve Librarian and may link to online library resources from Moodle.

All students and faculty have access to Inter-Library loan for books and periodical articles that are not owned by the BCC Library. To request an interlibrary loan, students and faculty may fill out the online form located on the library home page.

The library collection includes several science databases including: *Access Science*, *JSTOR-Ecology and Botany*, *Science Direct*, *Science Online*, *Green File*, and *Net Anatomy*. General Databases such as Proquest and Academic Search Premier also provide access to numerous scientific journals.

Weeding of the collection is ongoing and the collection is updated as the library budget permits. **The library has received Perkins Grant Funding for three years that was used to purchase library technology equipment and a significant number of books related to the “career” areas: horticulture, landscaping, and environmental technology.**

According to the library’s link resolver, Serials Solutions, the library has access to 1,542 full-text journals in Biology, **2,024 full-text journals in Agriculture, Botany and Forestry**, **223 full-text journals in Environmental Science** and 51 full-text journals in Marine Science. Most of the journals are available online through our general and science databases. The library’s “Journal Titles List” provides links to specific titles and issues of interest. The journals are also searchable and linked full text to the BCC Collection via “Google Scholar.” Online subscriptions to two important scientific journals, *Science* and *Nature*, were established three years ago. The library retains print subscriptions to scientific journals that are not available online at a reasonable cost.

Library technology includes networked computers, WIFI, Ipads and other tablets, Kindles, and Nooks. The library houses photocopiers and scanners for student use. The Paramus Campus library is open over 80 hours per week with extended hours at the end of the semester.

Possible areas to address:

Review and replace dated A.V. materials.

Regular weeding of the book collection.

Increased availability of Biology and Horticulture Apps for use on mobile devices.

Color printing in library for biology and horticulture images.

Recommended OER (Open Education Resources) textbooks to supplement collection.

COMPETITION

The BCC Horticulture Program is one of three Community Colleges in New Jersey to offer a Certificate or A.A.S. degree in Ornamental Horticulture. The other programs are at County College of Morris and Mercer County Community College. An A.A.S. in Horticulture is offered at Cumberland Community College

The Horticulture courses offered at each are: BCC - 24; Mercer - 19; Morris - 17

County College of Morris - COMPARISON

Landscape and Horticulture Technology page - <http://www.ccm.edu/academics/divdep/hns/LHT>

Curriculum Checklists -

<http://www.ccm.edu/studentLife/CampusServices/advisement/fall2015checksheets.aspx>

CCM Programs – Landscape and Horticultural Technology, Associate in Applied Science Degree – A.A.S. Agribusiness, Landscape Management and Design, or Turf and Turfgrass Management; Career Certificate

Mercer County Community College - COMPARISON

Ornamental Horticulture page – http://www.mccc.edu/catalog/programs/HORT_AAS.pdf

Ornamental Horticulture program brochure – http://www.mccc.edu/pdf/program-brochure_horticulture.pdf

MCCC Programs – A.A.S. in Ornamental Horticulture with concentration in Ornamental Horticulture, Landscape Design or Floral Design; Certificate of Proficiency in Ornamental Horticulture; A.S. in Plant Science

Cumberland County College – COMPARISON (not Ornamental Horticulture A.A.S.)

Horticulture Program page – <http://www.cccnj.edu/agriculture/agriculture-horticulture>

CCC Programs – A.A.S. in Agriculture, Agribusiness or Horticulture; Certificates in Ornamental Horticulture, Floriculture, Landscape Technician

TRANSFER OPPORTUNITIES

Rutgers, The State University of New Jersey – TRANSFER

Rutgers School of Environmental and Biological Sciences – <http://sebs.rutgers.edu/majors/>

Rutgers Department of Agricultural, Food, and Resource Economics – <http://dafre.rutgers.edu/>

Delaware Valley University – TRANSFER

Horticulture Program – <http://www.delval.edu/academics/undergraduate/school-of-agriculture-and-environmental-sciences/plant-science-1/horticulture-bs>

Horticulture Course Descriptions – <http://catalog.delval.edu/index.php?catoid=4>

Penn State University – POTENTIAL TRANSFER

Plant Sciences Student Handbook – <http://plantscience.psu.edu/students/advisers/handbook>

University of Maryland – POTENTIAL TRANSFER

Plant Science and Landscape Architecture – Plant Science <http://www.psla.umd.edu/academic-programs/undergraduate-programs/plant-science>

Plant Science and Landscape Architecture – Horticulture and Crop Production

University of Maryland CORE Audit –

http://www.psla.umd.edu/sites/default/files/docs/AG_Science_Tech/agsciaudit%202014%20core%20Rev.pdf

There are also a number of excellent Horticulture options at colleges further away:

California Polytechnic – San Luis Obispo

Purdue University

Colorado State University

Texas A & M

Cornell University

University of California – Davis

Michigan State University

University of Florida

North Carolina State University

University of Georgia

Oregon State University

Virginia Tech

FACILITIES

Indoor Classrooms

There are two primary Horticulture classrooms: Ender Hall Rooms E186 and E187. Alternatively, E155E and E189 are also used as needed.

Room E-187 is both a larger classroom and laboratory for microscope (light and dissecting) work. There are varied collections of herbarium specimens, arborist samples, insect mounts and vials, plant disease specimens, rock and media (soil and soilless types) that are invaluable in demonstrations. The room has a growth chamber, laminar flow hood, soil oven and other equipment and tools relevant to plant studies. There is also a nice selection of reference materials for plant disease and insect identification. The overhead LCD projector and installed projection screen along with the desktop computer and document camera allow for PowerPoint, hard-copy and even some 3-D materials to be readily shared with the class.

Room E-186 is a general purpose smaller classroom with an open view to the headhouse and attached greenhouse as well as the floral cooler. It is designed for hands-on work in a more conversational setting.

Relative to accommodating the handicapped who need wheelchairs, both E-186 and E-187 as well as the greenhouse are handicapped accessible. Dr. Fischer has worked extensively in Horticulture Therapy programs and BCC at one time had a program for this. Professor Wiles has had some experience with this while coordinating volunteers for Senior Centers.

Greenhouse has a headhouse for plant preparation and potting and four climate controlled bays. It is a much improved, larger and more functional version over the prior one.

Room E-155E is a primary alternative larger classroom to E-187 for some lectures and for its access to the Ender central courtyard with a rear door to enter. The overhead LCD projector and installed projection screen along with the desktop computer and document camera allow for PowerPoint, hard-copy and even some 3-D materials to be readily shared with the class.

Room E-189 is a computer classroom used for classes in CAD where we have a DynaSCAPE program installed for student and instructor use.

Outdoor Classrooms

Ender Hall is about a quarter mile from the main building, so it provides the space and peace to develop gardens and turf areas. Across the road from Ender Hall is a small climax forest of maple, oak and beech.

The central courtyard area, just outside of the Cyber Café, is extensively landscaped with woody and herbaceous materials, as well as hardscaping and a gazebo that are used extensively in teaching. *Due to extremely high winds, we recently lost a heritage willow tree which was planted by Dr. Fischer over 30 years ago. Fortunately it caused minimal damage overall and much of this area will be redesigned and replanted. The students expressed sorrow at the loss of the tree, but were fascinated by its massive structure which was even more evident after it fell.*

In a gated area outside the greenhouse there is a storage shed and a small poly house for overwintering materials.

On the north side of Ender Hall, outside of the Early Childhood program area, there is a nicely landscaped area for the children to play in, which also provides some live plant materials for classroom use.

Beyond Ender Hall, the entire Bergen Community College Paramus campus is utilized for teaching site analysis, plant identification, insect and disease diagnostics, landscape design and maintenance, etc.

Overall, through the extensive collections and plantings by Professor Jack Fisher and even more by Dr. Steve Fischer and Dr. Sydney Birnback, the BCC campus is well covered with woody and herbaceous native and introduced plants for study.

Field Trip Network

Through extensive longstanding relationships with businesses and public landscaped areas Dr. Fischer has developed numerous industry contacts willing to host class field trips at their locations. These include retail and wholesale florists, garden centers, production greenhouses, botanical gardens, power equipment dealers, etc. Many professional contacts also visit classes to provide special presentations.

Faculty and staff also encourage students to attend trade and consumer shows, as well as parks and public gardens to stay current with new developments. When possible, faculty arrange for students to enter shows free of charge, generally in exchange for assistance they provide at the shows.

FOCUS ON SUPPORT

Bergen Community College:

- For 40 years we have had unwavering support from our Department Heads and Deans.
- Monetary support that is beyond the academic concerns of the program is supplied by the BCC Foundation from floral design and plant sales revenue.
- Internal and external support of the program has also been featured by our public relations staff that has informed faculty, staff and students of upcoming sales and events we sponsor at the college.

BCC and Horticulture Advisory Board:

- The cooperation between Hugh Knowlton, BCC Grounds Supervisor and Horticulture Advisory Board member, and the Horticulture faculty and staff has resulted in the continual beautification and maintenance of the Ender Hall landscape areas and central courtyard.

Horticulture Advisory Board:

- The twenty members of the Horticulture Advisory Board, including four BCC faculty and staff, meet for three scheduled business meetings and one social event in December. Attendance averages over 80% at each meeting.
[Advisory Board Profile Sheets are on file]
- The Advisory Board is sent special invitations to BCC Horticulture and other functions.
- Example of Advisory Board recent support: Invited Glenn Jacobsen was invited as a guest lecturer to the Fundamentals of Horticulture class – Sept. 8, 2016.

New Jersey Landscape Contractors Association:

- The New Jersey Landscape Contractors Association utilizes our former campus nursery facility for yearly testing of candidates seeking certification as a Certified Landscape Technician (CLT). There is a long-standing agreement to provide a test center for this nationally recognized certification program.
- The New Jersey Landscape Contractors Association also offers scholarships to BCC students, with three scholarships in 2016.

North Jersey Community:

- Support from the Bergen County Community was very visible with the very successful “Come Grow North Jersey Garden Symposium” co-sponsored by the Bergen Record and the BCC Horticulture Program from 2011-2016 with over 120 people participating annually. The speakers, which featured Dr. Fischer and Professor Wiles, covered a wide

range of topics from attracting birds to your garden to plant propagation, soils and pest control practices.

- Dr. Fischer reviewed and provided an evaluation report on the condition of the City of Hackensack greenhouse on site in December, 2016.
- 201 The Best of Bergen magazine feature 2/1/2017 – Bergen Community College Ornamental Horticulture Program turns 40 (50,203 circulation)

FOCUS ON COMMUNITY

BCC Community On-Site:

- As previously listed with the Garden Symposium.
- Teen STEM Days.
- “Scoskie Hall Re-landscape Project.” “A 4 SEASON LANDSCAPE.” Designed and Installed by the Students of the 2017 Principles of Landscaping Class. This is the 40th Graduating Class of Horticulture Students at Bergen Community College. Ribbon cutting ceremony was on Tuesday, May 9th at 1:00 pm in the Scoskie Hall Parking Lot.
- Invited Mr. Andee Dixon, teacher of landscaping at BCTS, as guest speaker, for Dr. Fischer’s February 16, 2017 class, following a meeting with him to coordinate students attending Bergen after high school.
- The BCC Center for Food Action Fundraiser Dinner, April 21, 2016, was hosted by Dr. Steve Fischer, Dr. Sydney Birnback and Professor Fred Golub and the Horticulture Club. It raised over \$5,000 to alleviate food insecurity.
- The Horticulture Program is often asked to provide flowers and/or plants for college functions, which we are pleased to provide as schedules permit. Students gain experience by helping in design and plant care for these events.
- Similarly, the faculty and staff routinely provide educational information on plant care, selection, propagation, etc. for faculty, staff, administrators, alumni and visitors as part of our outreach effort.
- The children in the Childhood Development Center are also a recipient of plants and flowers from the Horticulture Program as we strongly believe in the importance of connecting children with nature.

Representing BCC Off-Site:

- Day of service at the NJ Botanical Gardens, Skylands Association (faculty, staff and student involvement) in September, 2016, which was directed by Dr. Fischer and included donations of plants as well as time.
- Dr. Fischer and Professor Wiles served as external program co-reviewers for Rowan College at Burlington County’s Agricultural Business Technology program in Spring 2016.
- The Horticulture faculty over time has done hundreds of lectures to on-campus and off-campus groups with clear introduction to our affiliation with BCC.

PROGRAM HIGHLIGHTS

The 2017 graduates of the Horticulture Program will represent 40 years of BCC trained students entering an industry that has had dramatic changes and challenges imposed on it. (201 Magazine, March 2017)

Students:

- Horticulture students get experience that involves design, installation and maintenance of garden areas on campus and participate in numerous college functions involving floral events.

Faculty/Staff:

- The hiring of Linda Wiles in September 2012 to replace the position held by Susan Gruben from 1994-2012 as full time faculty in the Biology/Horticulture Department.

Curriculum:

- Curriculum changes have been made to permit greater flexibility for both students entering the field of Horticulture as well as for those already practicing the profession.
- The new technology utilized in the classroom and continued hands-on component has kept pace with industry expectations for a graduate of the program.

Support:

- Several new Advisory Board Members have been appointed to represent the broader fields of plant studies available to our graduates.
- There has been continuous representation by one or more students to our Horticulture Advisory Board.

Community:

- For 4 years straight BCC faculty, staff and students were an important part of the Macy's Flower Show in Herald Square. Three of the six windows on Broadway and a variety of specialized gardens were assigned to them.

Scholarships:

- The department works year-round to simultaneously provide money to fund two internal memorial scholarships, Jacob "Jack" Fisher and Peter Snell and to provide production and sales training for students. The sales are at Thanksgiving, Christmas/Hanukkah, Mother's Day and Spring
- Several External Scholarships include NJLCA, Brenda Boffa (former BCC student), Ho-Ho-Kus Garden Club, Saddle River Garden Club, Sundial Garden Club

BRENDA BOFFA



OCTOBER 25, 1974 - JUNE 27, 2016

BCC Scholarships were created to honor the memory of these individuals: Brenda Boffa, Jack Fisher and Peter Snell.



Jack Fisher
Founder, BCC Horticulture Program



Peter Snell
BCC Horticulture Instructor

PROGRAM SUMMARY

For forty years the Horticulture Program has graduated students who have taken their training to a variety of levels and types of achievement: academic (B.S., B.L.A., M.S., M.L.A., Ph.D.); organization (Executive Director, President of Horticultural Associations – including national, Advisory Board); business (owner, foreman, manager).

Some students have taken Horticulture classes to fulfill personal interests and not to satisfy degree requirements for completion of the degree. Others have taken classes for enriching their creative or inquisitive minds. Some transfer in from a field that they have become disenchanted with and have always found plants and people who like plants to be a very satisfying experience.

Some have transferred from BCC to continue studies at Rutgers, Delaware Valley University, Colorado State, University of Oregon, and other institutions.

“Come Grow with Us at BCC” has always been the credo for the program as well as the welcoming remark to students considering a Plant Science career. While the emphasis has always been on the ornamental side of Horticulture (Landscape Design, Floriculture, Floristry, Interior Plantscaping), the core courses HRT 101, 102, 112, 232 (Fundamentals of Horticulture, Plant Science, Pests and the Ornamental Plant, and Plant Propagation, respectively) provide a student the academic and practical knowledge to begin a career in other Horticultural pursuits.

The Horticulture Advisory Board has always played a critical role in the Horticulture Program’s success. The diversity of individuals and the experience they bring to the coordinators of the program is unrivaled and highly constructive. The support they provide for making changes in the direction the program should go is directed toward student success for both entry level and advanced placement positions in the plant industry.

The simple task of how to water a plant properly is not something an employer should need to train for, but a task learned at BCC. How an employer wants a floral design to look for their customer should be a minor adjustment to the employee’s handling of flowers.

In summary, the BCC Horticulture student has always received, and will continue to receive, training for entry-level positions in a career of their choosing, be it design, maintenance, installation, problem solving, IPM, pest monitoring, plant identification or crop production. The future has never been so clear and promising for the individual with a passion for the environment plants share with people.

ACTION PLAN

PROGRAM GOALS

1. Increase the overall Horticulture Program student success as measured by:

- Success of students in transferring, entrepreneurship or gaining employment.
- Self-reported student satisfaction with their classes and work.
- Increased contact with alumni of the program.

2. Increase the overall Horticulture Program as measured by:

- Number of students in Horticulture classes, total credit hours.
- Facilities improvements and outreach to the BCC and surrounding community.

Responsible Party(ies): BCC Biology/Horticulture Department Faculty and Administration

Time Frame: Five Years (2017-2022), dependent on resources provided

DETAIL BY PROGRAM FOCUS

FOCUS ON STUDENTS

Continue:

- Marketing the program externally – Association and Trade Shows.
- Marketing the program internally – Open Houses, Major Fairs, Facility Tours.
- Maintain student internships.
- Replicated lab and field research for students.
- Growing and sales experience via the greenhouse sales events.
- Off-campus field trips to solidify classwork and real world experience.

Redesign:

- Brochures to coordinate with program degree and certificate changes.
- Website to coordinate degree and certificate changes and update other areas.

Expand:

- Work on student observational skills – RBPB methods and hands-on labs.
- Advisory and guidance work with students.
- Alumni contact.
- Encourage students who have “taken a break” from studies to complete them.
- Original lab and field research for students.
- Leadership potential for students via the ‘Sustainability in Nature’ class.

FOCUS ON FACULTY/STAFF**Continue:**

- Strong, supportive relationships with Horticulture faculty and staff.
- Strong, supportive relationships with colleagues at all levels throughout BCC.
- Strong, supportive relationship with Horticulture Advisory Board.

Expand:

- Bring in more adjunct faculty to cover certain Horticulture courses.

FOCUS ON CURRICULUM**Continue:**

- To be competitive in quality and quantity of Horticulture courses with other community colleges.

Redesign:

- A.A.S. Landscape Design/Build to a Certificate of Achievement (Appendix G).
- Combine Landscaping Certificate & Grounds Management Certificate into a single Landscape and Grounds Management Certificate (Appendix H).

Expand:

- BIO-217, Sustainability in Nature, is suggested as an opportunity to bring much-needed leadership and community involvement to students.

FACILITIES & EQUIPMENT

Update:

- E-186 needs to have a computer with LCD projector, document camera and screen installed to become a smart classroom.
- E-187 needs to have an updated computer with LCD projector, document camera and screen installed so that it is effective.
- The microscopes in E-187 need to be cleaned and repaired, and some need to be replaced. They undergo hard use from beginning students and are in sub-optimal condition for teaching.
- An E-187 microscope – camera set-up is strongly recommended to enable instructor to share images with the entire class.
- E-189 needs to have an updated version of DynaSCAPE installed on the computers for use by the Landscape Computer Design class.
- The greenhouse needs a new computer control system installed and new drainage system installed.

Redesign:

- It would be best, if possible, to hold E-186 and E-187 exclusively for the Horticulture Program for Horticulture and Biology classes taught by Horticulture faculty and adjunct faculty use. Some materials have been damaged and experiments disrupted by students from other disciplines using the room.

Expand:

- E-187 herbarium, insect, disease, disorder collections will continue to be expanded via student class work and instructor material collecting.
- The utilization of the living plant collections on campus with the labeling and mapping of these on campus.
- Storage facilities from a 8' x 12' wood shed to be placed in the greenhouse complex area.
- Horticulture is introducing raised beds and cold frames for maintaining cold requiring plants.

RESOURCES

Continue:

- Field trip network.
- Library Information Literacy training sessions for students.
- Use of Edith Sirianni's Library Research Guides for classes.

- The labeling of native and introduced woody plant species on campus is being undertaken.

Redesign:

- Work with library to determine outdated materials and suggest new holdings – both hard-copy and electronic resources.
- The replanting of the Ender Hall Center Courtyard due to storm damage and loss of our very large weeping willow. A dwarf conifer garden and other plantings will change the area from a shade garden to a sun garden.

Expand:

- Propagation of selected perennials, ground covers, tropical plants, succulents and herbs via a stock plant production system.
- Development of a Master Plan of the grounds and gardens around Ender Hall.

FOCUS ON SUPPORT

We look forward to the continued support of our network:

- Department Heads (Professor Bob Highley)
- Deans (Dr. P.J. Ricatto)
- Administration (Dr. William Mullaney)
- Colleagues throughout BCC, especially in the Biology Department
- BCC Foundation
- BCC Public Relations Staff
- BCC Program Assessment Staff (Professor Melissa Krieger and Professor Gail Fernandez)
- BCC Graphics Department (Mr. Wilson Aguilar)
- BCC Library (Professor Edith Sirianni)
- BCC Center for Institutional Effectiveness (Mr. Jesse Jacondin)
- BCC Grounds Supervisor (Mr. Hugh Knowlton)
- Horticulture Advisory Board
- New Jersey Landscape Contractors Association
- The North Jersey Community

FOCUS ON COMMUNITY

In consideration of available time and resources, we plan on continuing, both on-site and off-site, to provide materials and expertise to the community.

APPENDIX A: EXTERNAL PROGRAM REVIEWER'S CURRICULUM VITAE

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CURRICULUM VITAE

Education:

MA. Educational Leadership Management & Policy, Seton Hall University, CEHS, 2012

BS. Business Management, Rutgers University, NCAS, 1990

AS. Business Administration, Bergen Community College, 1987

NJ Department of Education, Principal, Standard Certificate #984952

NJ Department of Education, Supervisor, Standard Certificate #884470

NJ Department of Education, Certified Teacher of Agricultural Occupations,
Certificate # 00212498

Employment:

Technical Education Teacher, Bergen County Technical Schools, Teterboro Campus
(1996 - 1/2013)

Dean of Students, Bergen County Technical Schools, Teterboro Campus (2005 - 1/2013)

Program Manager of Technical Education Assessment, Bergen County Technical Schools,
Teterboro Campus (2005 - 1/2013)

Assistant Principal, Bergen County Technical Schools, Paramus Campus (2/2013 - 11/2015)

Director of Curriculum, Passaic County Technical Institute, Wayne, NJ (11/2015 - Present)

Faculty Adjunct & Arboricultural Consultant, NJAES Office of Professional Continuing
Education (1992 – Present)

Visiting Scholar, Rutgers University Newark College of Arts & Sciences, Biology Department,
(2000 - Present)

Faculty Adjunct, Bergen Community College, Biological Sciences & Horticulture Department,
(2002 - Present)

NJEA, Frederick L Hipp Foundation for Excellence in Education, Collaborative Grant Recipient
1999

Sterling Consultants LLC, Director, Horticultural & Arboricultural Education Programs (2004-Present)

Certifications/Licenses:

NJ Department of Environmental Protection, Board Certified Tree Expert, License # 340

International Society of Arboriculture, ISA Certified Arborist, License # NJ0223A

International Society of Arboriculture, ISA Certified Tree Worker/Climber Specialist,
License # NJ0223AT

Project Lead The Way / Rochester Institute of Technology Certificate in Civil Engineering &
Architecture, 2003

Rutgers University, NJAES Office of Continuing Professional Education, Geomatics (GIS)
Certificates, 2000

CDL Class A Driver's License, Tank Truck, Articulated Trailer & Motorcycle Endorsements
(current)

Awards and Honors:

Board Member, New Jersey Chapter of the International Society of Arboriculture 1994 - 1997

Past President, Arborist Association of New Jersey 1996 - 1998

Recipient of Arborist of the Year, AANJ (Arborist Association of New Jersey) 2001

Recipient of Excellence in Arboricultural Education, NJAISA (New Jersey Arborists ISA
Chapter) 2002

Member Kappa Delta Pi, International Honor Society in Education, Inducted 2010

U.S. Department of Education, National Blue Ribbon School, Administrator & Teacher -
BCTHS Teterboro 2012

Committee for the Advancement of Arboriculture, New Jersey Master Arborist #11, 1996

Rutgers University's NJAES, Office of Continuing Professional Education, Most Highly Rated
Instructor in 101 Year History (Current)

Community Work:

Township of Little Falls, Shade Tree Commission, 1991 – Present, Commissioner, 2000 - 2012
Member, BCTS District, Readiness and Emergency Management for Schools Grant Team,
2007 - 2010

Member, BCTS District Pandemic Influenza Planning Team, 2006 – 2009

Advisory Board Member, Bergen Community College, Horticulture Department, 2000 – Present

Member: NJ Association of School Administrators, Tree Care Industry Association, NJ Arborist
Chapter International Society of Arboriculture, International Society of Arboriculture, NJ and
National Association for Career & Technical Education

Lecturer, Rutgers Home Gardener's School 1996 – Present

Lecturer, Scott Arboretum of Swarthmore College 2001 – 2003

Featured in the following Newspapers: Record, Star Ledger, New Jersey Herald,
Passaic Valley Today, Montclair Times, Home News Tribune

Featured on the following Radio Station: WDEL 1150AM The Allan Loudell Show,
as a Certified Tree Expert Guest Speaker

Lecturer, Sterling Consultants LLC, Arborist University (arboristuniversity.org)

On-line & Hybrid Arboricultural Educational Programs

Additional Educational Programs Presented:

NJ Turfgrass Expo, Rutgers Cooperative Extension of Essex County, Rutgers Cooperative
Extension of Bergen County, Rutgers Cooperative Extension of Morris, Sussex, Passaic Union &
Bergen Counties Tree Day Program, Totowa Shade Tree Commission, Little Falls Shade Tree
Commission, Rutgers NJAES Home Gardeners School, New Jersey Shade Tree Federation, NJ
Landscape Contractors Association, NJ Arborists Chapter of the International Society Of
Arboriculture, GIE Expo, Scott Arboretum of Swarthmore College, Stony Brook Garden Club of
Princeton, Curricula Practicum

Secondary School Level: Civil Engineering & Architecture, Intro to Geographical Information
Systems, (GIS), Plant Science, Botany, Arboriculture, Landscape Design, Landscape
Maintenance, Landscape Construction, Horticulture, Floriculture, Turf-grass Management,
PHC /IPM & Pesticide Safety.

College & University Level: Plant Science lecture & lab, General Horticulture lecture & lab, Fundamental of Horticulture lecture & lab, Arboriculture lecture & lab, Integrated Pest Management & Plant Health Care lecture & lab, ISA Arborist Certification Program lecture & lab.

Adult Continuing Education: ISA Arborist Certification Program, NJ Certified Tree Expert Prep Course, Plant Identification, ANSI Z133.1 Green Industry Safety Program, Plant Selection, Plant Identification, ANSI A-300 Standard Series, Air-Spade (RCX) Excavation, Calibration of Pesticide & Fertilization Application Equipment, Proper Planting Techniques, Prescription Fertilization, Proper Pruning Techniques, Plant Health Care & IPM, Municipal Shade Tree Management, Arboriculture, Hazardous Tree Identification, Basic Tree Climbing, Plant Science.

35 years of experience in Green Industry Careers, with 24 years as a Technical Skills Educator

References Available Upon Request

APPENDIX B: DR. STEVEN FISCHER'S CURRICULUM VITAE

Steven Jay Fischer, PhD

137 Highland Road
North Haledon, NJ 07508
(Cell Phone 651-206-2865)

I. EDUCATION:

<u>DEGREES</u>	<u>DATE</u>	<u>COLLEGE or UNIVERSITY</u>	<u>MAJOR</u>
B.S.	1970	Delaware Valley College of Science and Agriculture	Ornamental Horticulture
M.S.	1972	University of Maryland	Horticulture
Ph.D.	1974	University of Maryland	Horticulture

II. EXPERIENCE:

<u>COLLEGE OR ORGANIZATION</u>	<u>DATES</u>	<u>RANK</u>	<u>DEPARTMENT</u>
Institute of Applied Agriculture, U. of MD	71-74	Instructor	Vocational Education
State University of NY Farmingdale, NY	9/74-6/77	Assistant Professor	Ornamental Horticulture
Bergen Community College Paramus, NJ	1/78 - Present	Professor	Science, Math & Technology

III. ADMINISTRATIVE ACTIVITIES AT BERGEN COMMUNITY COLLEGE:

1978 – 1995	Co-coordinator for A.A.S. Horticulture Degree with Professor Jacob Fisher
1991 – Present	Coordinator for A.A.S. Horticulture Degree
1984 – Present	Coordinator for Floral Design Certificate
1989 – Present	Coordinator for Landscape Certificate

IV. **OTHER EXPERIENCES:** (Documentation Available)

Curriculum Developer for certificate programs in Landscaping, Floral Design and Grounds Management.

Coordinator of 3 very successful reviews of the Horticulture degree and certificate programs.

Co-creator of People Plant Relationships, a General Education Biology course with Dr. Sydney Birnback, Professor of Psychology.

Designer/Project Manager for numerous landscape sites in the metropolitan area.

Consultant to a number of businesses and organizations in the horticulture industry.

Recipient of 3 CIRD Grants at Bergen Community College.

President of the Parents Association at Stevens Institute of Technology in Hoboken, N.J.

Commentator : • for radio station W.V.N.J. with John Bell and Meadowlands Cablevision, Channel 3, • with John Sanders and for On-Campus at Bergen Community College with Amelia Duggan.

Guest Lecturer: • at numerous horticultural conferences, conventions, and short courses.

•transatlantic crossing of the Queen Elizabeth II passenger liner, • garden clubs, civic and social organizations on wide variety of horticultural topics.

Coordinator of flower show exhibits for Delaware Valley College, University of Maryland, S.U.N.Y. at Farmingdale, Morningside Greenhouse and Bergen Community College.

Board Member: •Skylands Association New Jersey Botanical Garden, Ringwood, N.J. •New Jersey Landscape Contractors Association, •New Jersey Agricultural Education Committee.

•Committee Member for the New Jersey Agricultural Education Advisory Council

Chairman: •B.C.C. Advisory Board for Horticulture. • Search committees for the Divisional Dean of Science and Health, Faculty and Technical Assistant Positions in Horticulture.

STUDENT FOCUSED:

- Advisor to students in the Horticulture Program.
- Participant at B.C.C. in the training for Freshman Year Experience Program.
- Participant in the pilot project grant for (P.I.L.) Partners in Learning at B.C.C.
 - Coordinated and participated with B.C.C. student in the Macy's Flower Show, New York City,
(2001 – 2005.)

TEACHING: 43+ years

Horticulture Courses:

Fundamentals of Horticulture
Turf & Grounds Management
Floral Design
Landscape Design
Landscape Plants and Materials I & II
Pests of Ornamental Plants
Site and Plan Analysis
Horticulture Co-op Work Experience

Biology Courses:

General Botany
People Plant Relationships

V. PUBLICATION:

Scientific research published in Journal of American Society for Horticultural Science and Hort Science.

APPENDIX C: PROFESSOR LINDA WILES CURRICULUM VITAE

LINDA SAUSSY WILES

2140 Wallace Street
Stroudsburg, PA 18360

lwiles@bergen.edu

CAREER OBJECTIVE: Associate Professor in Horticulture/Biology at Bergen Community College.

EDUCATION

Penn State University	M.S. in Horticulture (57 credits), incl. Genetics (19 credits) - 1978
University of Pittsburgh	Post-baccalaureate work in Art - 1975
Virginia Polytechnic Institute	Graduate work in Biology (16 credits), Wildlife focus - 1974
Clarion University	B.A. in Biology and B.A. in English - 1974

WORK HISTORY

2012 -	Assistant Professor, Bergen Community College, Paramus, NJ
2006-	Audubon Certification Committee, Glen Brook Golf Course, Stroudsburg, PA
2006- 2014	Natural Resource Commissioner & Greenway Advisory Board, Stroud Region Open Space & Recreation Comm., Stroudsburg, PA
2012- 2013	Adjunct Horticulture Faculty, Northampton Community College, Bartonsville, PA
1998-2011	Extension Educator, Penn State University, University Park, PA
1990-1998	Marketing/Technical Services Professional, Oglevee Ltd., Connellsville, PA
1979-1989	Plant Breeder, Park Seed Co., Greenwood, SC
1977	Research Assistant in Plant Breeding, Penn State University, University Park, PA
1975-1976	Technical Assistant/Natural History Instructor, Carnegie Museum of Natural History, Pittsburgh, PA
1974	Accounting Clerk, James H. Matthews Co., Pittsburgh, PA

EXPERIENCE

Teaching

- College classes in: Fundamentals of Horticulture, General Botany, General Biology I, Horticulture Marketing and Sales, People Plant Relationships, Pests of Ornamental Plants, Plant Propagation, Plant Science
- Substitute college classes in: Interior Landscaping, Landscape Plants & Materials I, People Plant Relationships
- Green industry personnel/owners, Pesticide Applicators from 1999-2011 – 4,002 attendees were instructed in 60 programs
- Small Farm Expo (tri-state NJ, NY, PA) attendees - in three years, over 4,000 clients were served
- Numerous presentations taught solely or jointly with Master Gardeners to non-profits, garden clubs, community groups and the general public

Working with People

- Advisement and mentoring for Horticulture/Biology and other students at Bergen as needed
- Master Gardener's Teacher and Coordinator
 - Managed volunteer training in three counties, training 120 adults and 11 teens
 - Taught 14 Master Gardener classes (~10 people/class) in six other counties
 - Key volunteer activities yielded 23,499 hours and 30,750 contacts through 2010
 - Mentored volunteers for hotline questions, garden writing, teaching, developing trial and community gardens, composting, fair & festival exhibits and community beautification
- Provided technical support to landscapers, grounds managers, nursery and greenhouse growers, communities, service groups, and the general public
- Provided technical support to sales personnel, distributors, and clients
- Supervised plant breeding and production staff

Research

- Current research based professional development study in teaching science
- Coordinated the development of three county trial gardens which served as a research base maintained by Master Gardeners
- Identified improved research methodologies, including breeding and seed germination
- Evaluated cultivars in breeding populations for a range of characteristics, including cold and heat tolerance, water stress, and container size
- Established, designed and coordinated trials with university researchers, public garden researchers, and commercial greenhouses
- Conducted research on the production of ornamentals
- Wrote, or assisted in the preparation of, six patents from my research

Writing and Editing

- Developed and wrote new curriculum to teach without textbooks or to supplement textbooks for most courses taught at Bergen Community College, Northampton Community College and Penn State University to assist students with instructional costs
- "Integrated Pest Management and Global Climate Change" factsheet for distribution at Bergen Community Forestry Conference, November 2013
- "Watchable Wildlife on the Trails" in Pocono Living Magazine, August/September 2013
- Northeast PA Commercial Horticulture Newsletter (6-8 pg./issue) – Published quarterly from 2000-current – 43 issues, 61,748 total circulation
- Commercial publications
 - "2010 List of Assistance and Regulatory Agencies for the Landscape, Nursery, or Other Green Industry Business" – Pub. July 2010
 - "How to Get Started in Landscape, Lawn, Nursery and Greenhouse Businesses & Succeed" – Pub. September 2011
- "The Master Gardener Calendar of Gardening" – 2 editions, 2002-2003, 2004-2005 (written with Master Gardeners)
- "Garden Spot" newspaper column – Edited and submitted 201+ articles by Master Gardeners and self (26,000 circulation per issue)
- Newsletter articles for Monroe and Pike Co. Extension – 181+ articles
- Horticulture/Gardening factsheets – 40 published from 2007-2010
- Coordinated production of and authored most of a company catalog for eight years (1997-1998 edition is 48 pages)
- Authored several articles for company newsletters and trade publications

Technology

- Integrating Moodle online course management into courses – May 2014 to current
- Developed project literature evaluation research guide with Edith Sirianni 2014
- Bergen Community College Horticulture website revised and updated August/September 2013
- Monroe Co. Horticulture Extension website – 2000-2008 – 252,551 hits on horticulture/gardening; 35% of commercial clientele indicated they used this information
- Developed “Landscaping, Grounds and Arborist” section of PSU Green Industry website
- Webinars with Dr. Gary San Julian – 2010 and 2011 – eight programs with 3,125 attendees

Management

- Assisted Dr. Steven Fischer with Horticulture program needs
- Developed student intention surveys to guide students to program completion and improve course scheduling
- Developed curriculum maps for Horticulture degree and certificate programs to clarify student guidance
- Developed library Horticulture and Botany reference list for Perkins grant
- Managed tri-county compost programs with 94 workshops reaching 3,058 attendees
- Negotiated contracts resulting in 24% cost savings annually
- Improved the administration and collection of royalties by 65% over four years
- Developed national freight program for company, increasing freight profits and effectiveness by 335% over four years
- Coordinated the labeling efforts for product branding, resulting in increased usage by 208% over seven years

Organizational Support

- **Bergen Community College** Committees [Academic Standing, Horticulture Advisory, Sustainable Learning Community, Web Advisory, Writing and Reading Across the Curriculum (WRAC)], Marketing Venues [Teen STEM Day, Let's Grow New Jersey, Spring 2013 Open House], Horticulture Spring Sale, Community Forestry Conference
- **Penn State University** Committees [Genetic Engineering, Landscape Horticulture, Pesticide Education Advisory, Master Gardener Steering Committee, Master Gardener Policy], Marketing Venues (Fairs, Festivals, Community Days), Ag Progress Days, Farm Show, Philadelphia Flower Show

Public Relations

Newspaper, Radio and TV interviews

Professional Associations

A.A.A.S. (American Association for the Advancement of Science) – (2017-)

LinkedIn Groups (2011-):

Science: Ecological Landscaping, International Plant Propagator, NSF Media & Informal Science Learning, Perennial Plant Association, Plant Breeders and Agents

General Education: LinkEds and Writers, PA/DE/NJ Distance Learning, Science Writers

PACAA (Pennsylvania Association of County Agricultural Agents)/NACAA (National Association of County Agricultural Agents) – 1998-2011

ESP (Extension Service Professionals) – 2010-2011

ACCOMPLISHMENTS

- Curriculum development of new course BIO-217 “Sustainability in Nature” General Education course (approved by NJ in Fall 2015 for General Education Science credits)
- Overall Achievement - 2008 PACAA Achievement Award
- Communications - 2010 NACAA 2nd place finalist for Team Newsletter; nine PACAA Communications Awards
- Public Speaking – Won Dale Carnegie Reporting Award, Human Relations Award, and Highest Award for Achievement
- Patents – *Achimenes* ‘Blue Rose’ PP5919, ‘White Rose’ PP6634, ‘Pink Rose’ PP6633, ‘Picotee Rose’ PP6637; *Pelargonium* ‘Global Rich Red’ PP10443, ‘Louise’ PP10185; numerous inbred lines and hybrids
- Academic Publications – M.S. on corn developmental patterns

OCCUPATIONAL RELATED TRAINING COURSES

- Bergen Community College – professional development activities annually
- Penn State University – professional development activities annually
- Dale Carnegie – semester course
- Tissue Culture – short course at University of Tennessee
- Leadership Skills – several courses at Clemson, the University of South Carolina and Penn State
- Photography – non-credit course at Penn State
- Computer Training – multiple courses in computer hardware, software and social media

APPENDIX D: SUMMARY FROM LAST PROGRAM REVIEW

The last Program Review was on May 26, 1998, submitted by Dr. John D. Martin, Chairman, Department of Ornamental Horticulture and Environmental Design, Delaware Valley College.

Faculty Recommendations:

At that time, Professor Jacob John (Jack) Fisher had just retired, and Dr. Steven Fischer was the only full-time position. Steve's "excellent reputation and track record of accomplishment and innovation" was strongly applauded. The extensive network of industry support, especially the very supportive Advisory Board, as well as his "great rapport with both students, fellow faculty, staff and industry" was noted.

Recommendations:

1. Full-time, tenure track budget line be reinstated. "A one man department, no matter how good the one man is, can be limiting, and potentially dangerous should something happen to the man."
2. Faculty diversity should be considered for the reclaimed position.
3. Upgrade faculty credentials with more M.S. and Ph.D. full and part-time instructors "Solid practical industry experience, however, should remain the primary prerequisite for hiring faculty for this hands-on program."

Mission Recommendations:

Department mission is relevant and consistent with BCC mission and the population served.

Curriculum Recommendations:

1. Two new courses recommended as proposed: Arboriculture/Integrated Pest Management and Horticulture Technologies.
2. Also a new A.A.S. Turf and Landscape Management was recommended, due to the large number of golf courses (three surrounding BCC alone).
3. An increase in interdisciplinary instruction, instructional partnerships with other institutions (Rutgers's Cook College, Ramapo College) and distance learning opportunities is recommended to stretch the finite resources.
4. Reviewer recommended increased articulation agreements with four year colleges in and out of state.
5. There was concern over grade inflation in Horticulture.
6. An interdisciplinary approach with Environmental Science at Bergen was recommended.

7. The use of data from the Office of Institutional Research and Planning could assist with target markets for programs.
8. A website on Bergen's server for Ornamental Horticulture was recommended. Associated with this is the potential for instruction delivered and/or assisted via the Web.
9. The incorporation of business oriented courses to the program was also recommended.

Facilities and Equipment Recommendations:

The facilities were improved from the reviewer's last visit, however, computer and audiovisual capability was needed in both E-186 and E-187. The greenhouse was in need of major updating. There are both built and natural landscapes useful for instruction around Ender Hall, but they were poorly labeled.

1. Due to the age and condition of the existing greenhouse, it was recommended that the old one be demolished and a new greenhouse, twice the size, and with updated benches, environmental control system, etc. built in its place.
2. Relocate the landscape and hardscape outdoor classroom area to the Ender Hall courtyard. The larger area is convenient for outdoor instruction and can be flood lit for evening classes.
3. Tissue culture lab with proper design and equipment can best be served at nearby Ramapo College as part of a collaborative venture.
4. Two new desk-top computer workstations on rolling carts with two portable or mounted LCD projectors for each classroom to have CAD, Landscape Imaging, Plant Material Databases, internet connectivity, especially for Horticulture Technology.
5. Fenced in site of the old nursery should be returned to former use and include a poly-(polyethylene plastic) greenhouse for overwintering container and nursery stock.
6. The classrooms and offices should be wired for internet and telecommunications.
9. State-of-the-art audiovisual equipment system should be available, including a video camera.
10. Plant materials in educational gardens and in the landscape should be better labeled to maximize benefit for Horticulture programs and the general college population.

Support and Resources Recommendations:

1. Library holdings, print and non-print are substantial, up-to-date and relevant. The library staff appears friendly, knowledgeable and service oriented. It is recommended that the availability of off-campus library searches via the internet be available.
2. The lack of technician assistance is an undue burden on faculty and is inequitable compared to other areas of BCC and needs to be corrected. It is recommended that a full-time technician be hired to assist for Horticulture.
3. The Advisory Board is a blessing – very active, supportive and concerned, and “is one of the Department’s most important resources.” While the board has a good cross-section of disciplines in Horticulture, it is recommended that one or more individuals of color be added.

Miscellaneous Comments:

“From the brief conversations with upper administration, there appears to be good support for the Ornamental Horticulture Department and its programs and an understanding of the Department’s value and potential. Indications are that Ornamental Horticulture should continue to be an attractive course of study with an excellent job and earnings potential. Working with the College’s dedicated and future oriented administration team and the excellent Ornamental Horticulture Advisory Board, the reviewer strongly feels that Bergen Community College’s Ornamental Horticulture Department has an excellent foundation for increased student and industry service and program and enrollment growth.” Dr. John Martin, 1998

APPENDIX E: HORTICULTURE ADVISORY BOARD 2016 - 2017

NAME	ADDRESS	PHONE(S), E-MAIL
Mr. Mark Borst	President, Borst Landscape & Design 260 W. Crescent Avenue Allendale, NJ 07401	201-785-9400 mborst@borstlandscape.com
Mr. Brian Brunsch	Arborist, SavATree 681 Lawlins Road Wyckoff, NJ 07481	201-891-5379 bbrunsch@savatree.com
Mr. Greg Carpenter	Owner, American Beauty Landscape Design, Inc. P.O. Box 9147 Paramus, NJ 07653-9027	201-265-2665 abld1@optonline.net
Mr. Robert DeRosa	Owner, DeRosa Landscaping 128 Spring Valley Road Montvale, NJ 07645	201-207-9589 derosal0761@aol.com
Mr. Jim Dusenbery	Grounds Supervisor, Dwight-Englewood School 315 E. Palisade Avenue Englewood, NJ 07631	201-569-9500 jdusenbery@optimum.net
Mr. Raymond A. Edel	Writer & Blogger 482 Valley Road Clifton, NJ 07013	973-207-7585 raymondaedel@gmail.com
Mr. Peter Evans	Golf Superintendent, Orchard Hills Golf Course 404 Paramus Road, Paramus 07652	201-447-3433 pevans@co.bergen.nj.us
Prof. Susan Gruben	Retired, BCC Professor 1 Tecumseh Trail Oakland, NJ 07436	201-405-2048 skgruben@aol.com
Mr. Glenn Jacobsen	Founder and President, Jacobsen Landscape Design & Construction 41 Birch Street Midland Park, NJ 07432	201-891-1199 Glenn@JacobsenLandscape.com

NAME	ADDRESS	PHONE(S), E-MAIL
Mr. Walter Perry, III	Greenhouse & Garden Center Manager Perry's Florist and Gardens 660 Harristown Road Glen Rock, NJ 07452	201-445-5668 perry3rd@optonline.net
Mr. Peter Punzi	Executive Director Tenaflly Nature Center 313 Hudson Avenue Tenaflly, NJ 07670	201-568-6093 ppunzi@tenafllynaturecenter.org
Mr. Christopher Raimondi	President and CEO Raimondi Horticulture Group 1 Hollywood Avenue Bldg. 28 Ho-Ho-Kus, NJ 07423	201-445-1299 chrisr@raimondihg.com
Mr. Bruce Rohsler	Owner Rohsler's Allendale Nursery & Florist 100 Franklin Turnpike Allendale, NJ 07401	201-327-3156 brohsler@rohslers.com
Ms. Dorothy Romaine	Retired, BCC Board of Trustees 90 George Road Emerson, NJ 07630	201-265-4765 dotromaine@verizon.net
Mr. Ted Szczawinski	Director of Curriculum Passaic County Technical Institute (PCTI) 35 Micklejohn Avenue Little Falls, NJ 07424-1023	973-389-4190 lszczawinski@pcti.tec.nj.us
Ms. Betty Wiest	Sales Associate Rohsler's Allendale Nursery & Florist 100 Franklin Turnpike Allendale, NJ 07401	201-370-0448 bgwiest47@gmail.com

FACULTY AND STAFF REPRESENTATIVES

NAME	ADDRESS	PHONE(S), E-MAIL
Dr. Steven Fischer	Coordinator, Horticulture Program Full Professor, Bergen Community College	201-447-9217 sfischer@bergen.edu
Asst. Prof. Linda Wiles	Faculty Representative Bergen Community College	201-447-9225 lwiles@bergen.edu
Mr. Garrett Planten	Horticulture Technical Assistant Bergen Community College	201-447-7955 gplanten@bergen.edu
Mr. Hugh Knowlton	Grounds Dept. Supervisor Bergen Community College	201-889-1268 hknowlton@bergen.edu

APPENDIX F: HORTICULTURE ADVISORY BOARD SURVEY

Dear Advisory Board Member,

To assist in our Program Reviewer's comments on activities of the Board, please complete this survey.

Thank you,

Steve and Linda

Name _____

Please complete this online by e-mail, or check off and mail in the enclosed SASE.

Activity	Yes	Comments
BCC Horticulture Advisory Board		
Adjunct instructor for any course		
Guest lecturer (on-campus or off-campus)		
Host of a field trip		
Involvement with any Horticulture program events (ex. Record/BCC Garden Conference, Macy's Flower Show, etc.)		
Employer of any BCC student or graduate		
Past or present member of any educational boards or plant societies (if yes, please specify)		

APPENDIX G: PROPOSAL FOR CERTIFICATE OF ACHIEVEMENT IN LANDSCAPE DESIGN/BUILD

This certificate is designed to replace the current A.A.S. Horticulture Landscape Design/Build. It removes BIO-108, BIO-130, WRT-101, WRT-201, Social Science elective and Humanities elective and eliminates twenty course credits.

Some Horticulture courses are also removed: HRT-103, HRT-204, HRT-213, HRT-214, HRT-233, HRT-236, HRT-292, HRT restricted elective, thus eliminating twenty-six course credits.

Rationale: The Horticulture Advisory Board and faculty in the Horticulture Program have explored many options to encourage greater participation in the pursuit of academic credential for people already in the industry or those wishing to complete this offering and to transfer, or complete other offerings, in a Horticulture Certificate of AAS degree program.

Support: After careful consideration by the Horticulture Advisory Board, the proposal to make this attractive to the industry received a unanimous vote to create a Certificate of Achievement from the existing courses in the program. The proposal was also accepted as a very positive incentive by the New Jersey Landscape Contractors Association Board for member certification as a Design/Build Contractor.

Resources: No new faculty, staff, equipment, costs, space or library resources will be needed for this proposal. All courses currently offered in the Horticulture Program will remain as presently listed in the BCC catalog.

HRT-102	Plant Science	4 credits
HRT-104	Landscape Plants and Materials I	2 credits
HRT-113	Principles of Landscaping	3 credits
HRT-235	Landscape Analysis	3 credits
HRT-130	Landscape Contracting	1 credit
HRT-114	Computer App. for Landscape Design	3 credits
HRT-215	Landscape Design and Building Mgmt.	3 credits
	Total credit hours	19

APPENDIX H: PROPOSAL FOR COMBINED CERTIFICATE

PROPOSAL TO COMBINE "GROUNDS MANAGEMENT" AND "LANDSCAPE" CERTIFICATES
TO A NEW "LANDSCAPE AND GROUNDS MANAGEMENT CERTIFICATE" (see bold items)

COURSE #	COURSE NAME	GROUNDS CERTIFICATE	LANDSCAPE CERTIFICATE	NEW COMBINED	NEW # CREDITS
HRT-102	Plant Science	yes	-----	-----	-----
HRT-103	Turf & Grounds	yes	yes	yes	3
HRT-104	Landscape Pls. & Materials I	yes	-----	yes	2
HRT-112	Pests and Orn. Plants	yes	-----	yes	4
HRT-113	Principles of Landscaping	-----	yes	yes	3
HRT-115	Floral Design	elective	-----	-----	-----
HRT-119	Ghse. Op. & Production	elective	-----	-----	-----
HRT-124	Irrigation Technology	yes	-----	-----	-----
HRT-125	Equipment Management	yes	-----	elective	(2)
HRT-130	Landscape Contracting	yes	yes	yes	1
HRT-204	Landscape Graphics	-----	yes	yes	2
HRT-233	Landscape Pls. & Materials II	-----	yes	elective	(4)
HRT-235	Landscape Analysis	yes	yes	-----	-----
HRT-236	Hort. Mktg. & Sales	-----	-----	yes	3
HRT-237	Arboriculture & Plant Health	yes	-----	elective	(3)
WRT-101	English Composition I	yes	yes	yes	3
BUS-101	Intro. to Business	-----	yes	-----	-----
DFT-107	Drafting I	-----	yes	-----	-----
INF-101	Intro. to Info. Technology	-----	yes	yes	3
HRT-ELECTIVE		yes	-----	yes	2-4
GEN.ED. ELECTIVE		yes	yes	BIO-131 General Botany	4

Combining Two Certificates into One Certificate

This is a transition between two earlier certificates, Grounds Management and Landscaping. Key Horticulture courses are added, Horticulture Marketing & Sales, Principles of Landscaping, Landscape Graphics and Introduction to Information Technology. Plant Science is replaced with General Botany to cover the General Education requirement.

Deleted for the new certificate are courses in Irrigation Technology and Landscape Analysis, as well as Introduction to Business and Drafting I.

Restricted electives change from Floral Design or Greenhouse Operations and Production to one of the following: Equipment Management, Arboriculture & Plant Healthcare or Landscape Plants & Materials II.

According to the Census Day Data Sheet from the BCC Center for Institutional Effectiveness, there is a large percentage of the BCC student populations that is part-time. This critical group of students represented 45% of the total student population in Fall 2016, and ranged from 42-47% over the past ten years. Credits generated by full-time students represented 71% of the total credits, with 29% from part-time students. Currently there is only a 0.3% decrease from ten years ago, with a 2.7% drop in part-time students, mostly covered by a 1.6% rise in full-time students.

BCC Spring 2016 enrollment is down more substantially with a 39% decrease from ten years ago, 12.9% of this is due to a loss of part-time students, also covered by a 5.9% rise in full-time students.

Summer sessions have dropped the most from ten years ago. Summer I enrollment is down 18.5% over ten years; Summer U enrollment is down 13.7% over ten years; and Summer II enrollment is down 7.6% over ten years. Overall for ten years, the total enrollment is down 10.7% and the number of credits generated is down 9.8%.

Analysis: We are discussing registration and scheduling with our students over the next two months and will make plans to address this for the Horticulture Program.

Rationale: The Horticulture Advisory Board and faculty, Dr. Fischer and Professor Wiles, have designed a single certificate "Landscape and Grounds Management" to replace the two current certificates in "Landscaping" and "Grounds Management." This also has the approval of the New Jersey Landscape Contractors Association, where Dr. Fischer serves on their Advisory Board. The choice of restricted electives will give greater flexibility to the student pursuing a Design/Build/Maintenance career path.

Support: Administrative support for this action has been expressed to the Horticulture faculty. In addition, our Horticulture Advisory Board has formulated the course offerings and unanimously supports it.

Resources: No new faculty, staff, equipment, costs, space or library resources will be needed for this proposal. All courses currently offered in the Horticulture Program will remain as presently listed in the BCC catalog.

APPENDIX I: RESEARCH BASED PROFESSIONAL DEVELOPMENT SUMMARY

Name: Linda S. Wiles

Date: May 16, 2016

Mentor: Dr. Sydney Birnback

Dean: Dr. P.J. Ricatto

Final Abstract (limit to 200 words):

A two-semester analysis of the use of daily observation essays (DOE) in improving student interaction with nature, others and class performance demonstrated the value of DOE. Two different writing assessments were developed, the test type of DOE and the control of topic essays, each counting for 15% of total grades. These were assessed in two courses of General Botany, and comparable DOE were used in professional courses in same period – Pests of Ornamental Plants in the fall, and Plant Science in the spring.

Essay quality and concept understanding compared to using science topic essays was 8.5% higher in the fall semester, 18.8% higher in the spring semester. Course grades were 25% better in the fall, 7.1% better in the spring. In the fall classes, there was a 31.6% greater connection to classmates in the DOE class over the control class, and 52.6% greater connection in the professional class over the control class. In the spring classes, there was 8.2% greater interest in science in the DOE class over the control class and 35.8% greater interest in science in the professional class over the control class. Class attendance, participation, and interest in science were greater in the DOE classes overall.

Modifications to the project (only record a response in the applicable areas, no one area should have a statement over 300 words):

- 1.) Research Question: What is the effect of the use of daily observations of nature (specifically of plants) on the individual student's interaction with nature, others and their class performance?
- 2.) Methods and Assessment Plan: Focused on comparing writing across the curriculum in two different formats – daily observations of nature compared to a series of topic essays. This was a two semester-long experiment with two classes of General Botany in each semester, and comparable daily observation essays for other courses, in Fall 2015 for Pests of Ornamental Plants, and in Spring 2016 for Plant Science. The original and primary focus was on comparing the same course, BIO-131, General Botany in each format. Since observations

are extremely important in both Pests of Ornamental Plants and Plant Science study and work, they were also included in the review.

In Spring 2016 the BIO-131-002 class included small groups of individuals who were already associates, therefore the survey question selected changed from connection to classmates to interest in science for the reported data. Attendance and participation data was also included as these were substantially different.

3.) Student Learning Outcome(s)

1. Demonstrate curiosity about nature
2. Demonstrate increased observational skills in the details reported
3. Demonstrate the ability to think critically and evaluate the importance of nature
4. Increased class cohesiveness

4.) Performance Indicator(s) for Student Learning Outcome

1. Quality of the essays and illustrations, questions asked and understanding in evidence.
2. Exam performance for the class, comparing between test 2 and test 3.
3. An improved classroom learning environment as evidenced by instructor observation and student comments.

Survey question –

“How interested are you in doing research [such as growing geraniums or germinating seeds?”

Attendance/participation comparison for Spring 2016 among classes was also reviewed.

5.) Teaching, counseling or librarianship strategies

Beginning classes with daily observation essays has the effect of relaxing students so that they are more ready to focus and learn during the class. This was observed directly by the instructor, as well as noted by several students.

Writing about personal contact with nature makes many students more open to discussing issues of concern with the instructor. It also encourages further interest in science as a career and/or as a part of their lives.

6.) Assessment Method(s)

A combination of several assessments were used: supplemental topics overall survey, changes in performance from the second to third exam, creative scientific writing and illustration lab practical (reflected in the first lab practical grade), midterm and final class individual student surveys. Upon a review of the attendance and participation patterns being dramatically different, this was added as an indicator for the Spring 2016 semester.

Significant Results

1.) Project Results (limit to 500 words):

In Fall 2015 two classes of BIO-131, General Botany, were taught using two different essay requirements, BIO-131-002 with daily observation essays (DOE), and BIO-131-003 with a series of topic essays. HRT-112-601, Pests and the Ornamental Plant, was used to further test the DOE format. Performance varied sharply in the different formats for several indicators, with the DOE format of BIO-131-002 being superior for this semester.

BIO-131-002 DOE compared to BIO-131-003: 8.5% better in average essay quality and concept understanding; 16.0% better in average test grades; 31.6% greater connection with classmates; 25% better in average course grades. HRT-112-601 compared to BIO-131-003: 9.6% better in average test grades; 52.6% greater connection with classmates; 32.1% better in average course grades.

In Spring 2016 two classes of BIO-131, General Botany, were taught using two different essay requirements, BIO-131-001 with DOE, and BIO-131-002 with a series of topic essays. HRT-102-601, Plant Science, was used to further test the observation essay format. Performance varied as for the Fall 2016 review, with the DOE format of BIO-131-001 being superior for this semester.

BIO-131-001 DOE compared to BIO-131-002: 18.8% better in average essay quality and concept understanding; 2.7% better in average test grades; 8.2% greater interest in science; 7.1% better in average course grades. HRT-102-601, Plant Science compared to BIO-131-002: 4.0% lower in average essay quality and concept understanding (due to four students not completing essays); 8.7% better in average test grades; 35.8% greater interest in science; 7.2% better in average course grades.

There was a substantial improvement from test 2 to test 3 grades for the DOE vs. topic Botany, BIO-131-001 had a test score increase from the 2nd to 3rd tests of 12.7%, vs an increase of 5.1% for BIO-131-002. The HRT-102-601 had a net increase of 4.0% from the 2nd to 3rd test.

Overall, the creative scientific writing and illustration part of the lab practical had comparable results for both Botany classes – 80.1% for the DOE, 80.7% for the topic essays, and as expected, the Plant Science class scored substantially higher at 88.1%

All four of the classes using DOE rather than topic essays had a better classroom environment that enhanced learning. As an indicator of this, the attendance and participation patterns differed dramatically in Spring 2016 – both DOE classes had an average of 93.6%, while the BIO-131-002 class with topic essays had an average of 84.9%.

2.) Interpretation of Results (limit to 500 words):

Nature writing, journaling, reflections – all different names for essentially the same process, is an important part of a science curriculum as demonstrated via the supplemental plant topics survey. There are students with excellent initial observation skills in each of the classes, as well as those less adept initially.

Students who have difficulty with writing in general did not appreciate working on any form of essays. There were significant improvements in their writing and analysis over the course of the term even though this was not a preferred classroom activity.

Individually, having a base of observations assists students with different learning styles and needs in doing better in the rest of the class assignments.

Reflection

1.) Reflection on the entire Research Based Professional Development Project (limit to 300 words):

We as a world are in challenging times to correct the results of poor environmental stewardship and to adapt to new environmental changes that are occurring. In order to do this, we need an informed and devoted citizenry. Each person needs to come to understand and care for the environment and actively participate in this process.

Reflecting on nature as a daily, or twice weekly, basis is a good start to this process. It also has the benefit of providing relaxation and focus for our daily endeavors. Writing about nature and illustrating those thoughts helps to reinforce the different aspects of what is observed. Sometimes these are very concrete and sensory, sometimes they are philosophical, other times they are profoundly personal.

2.) Modifications based on the results (limit narrative to 300 words, no limit on appendices):
Primarily, I would include daily observation essays in all of my courses, with adaptations based on the subject, such as was done for Pests of Ornamental Plants in Fall 2015.

Based on student response for the value of outdoor plant reviews in HRT-102, with 92.5% finding these “a lot” to “extremely” important to their classroom experience, it would be good in professional courses to tie the observation essays directly to class lab and field work where possible.

Some students with limited experience with nature had difficulty selecting topics and a directed approach on topic may assist some of them as a back-up option when they cannot think of a topic for a given day. This is best limited to only so many “back-up” topics per student, so that they can improve their observational skills otherwise.

Dissemination and Collaboration

1.) Dissemination Actions (limit to 150 words):

Initially I had proposed discussing the project results in small groups or individually to any interested parties. I can have this available in fall 2016, starting with an introduction at a Biology and Horticulture Department meeting.

Based on feedback from Dean Ricatto, I will plan on expanding this to a wider audience as well to the STEM Cadre, faculty development workshop or at a Division meeting this fall.

2.) Collaborative Actions (limit to 150 words):

Since these are nature-based essays, it would be ideal to start with the sciences, then the arts and other disciplines. Some instructors may prefer having the essays with a specific focus the students can work with – such as the cherry tree blooming or the fall foliage.

It would work well with Science-English Department collaboration, possibly in the Science Infusion program.

APPENDIX J: BCC HORTICULTURE COURSES

HRT-101 Fundamentals of Horticulture

This course is designed to acquaint the student with the multifaceted field of ornamental horticulture. Topics for examination include the historical role of horticulture from the artistic and scientific perspectives, as well as its commercial and aesthetic significance and applications for the future. Discussion of current employment opportunities, trends and practices will be emphasized. Noted guest lecturers from all fields of horticulture will share their views and experiences. Lecture [2.00], Laboratory [3.00]. Credits – 3

HRT-102 Plant Science

This course is designed to familiarize the student with the horticultural relationship of plants to botanical anatomy and function, including the limiting factors that influence plant growth such as light, temperature, water and nutrients. The characteristics of soils, soil nutrient deficiencies, fertilizers and soil amendments, as well as their relationship to plant growth will be covered. Lecture [3.00], Laboratory [3.00]. Credits 4

HRT-103 Turf and Grounds Management

This course is the study of turf and plant practices on the residential and commercial sites. Emphasis is placed on the structure and growth habits of commonly used species and cultivars including installation, renovation and maintenance practices. Exposure to grounds maintenance equipment commonly utilized in the installation and maintenance of the landscape is included. Lecture [2.00], Laboratory [3.00]. Credits 3

HRT-104 Landscape Plants and Materials I

This course is an introduction to the basic genera of the most commonly utilized trees, shrubs and ground covers in the landscape. In addition to identification, growth form, color, texture and habitat requirements, and their uses in the residential and commercial sites will be studied. Lecture [1.00], Laboratory [2.00]. Credits 2

HRT-112 Pests and the Ornamental Plant

This course introduces the student to the insects, diseases, and environmental disorders that affect plants. Identification of pests and methods of controlling them are emphasized. Lecture [3.00], Laboratory [3.00]. Credits 4

HRT-113 Principles of Landscaping

This course is a study of the design and development of landscape plans from plot plans and site analysis studies. Instruction in drafting and mechanical skills is included. Lecture [2.00], Laboratory [3.00]. Credits 3; Prerequisite HRT-104; Corequisite HRT-104

HRT-114 Computer Applications for Landscape Design

This course will introduce students to the Computer Aided Design [CAD] and quotation software used by professionals in the green industry. The course's focus is on learning to use industry standard computer software such as DynaSCAPE to develop landscape design projects. Students should be familiar with basic computer functions before enrolling. Lecture [2.00], Laboratory [2.00]. Credits 3

HRT-115 Floral Design

This course is a study of the plants, supplies, and design skills used in flower arranging. Laboratory experiences include seasonal and non-seasonal arrangements for a variety of occasions. Lecture [2.00], Laboratory [3.00]. Credits 3

HRT-119 Greenhouse Operations and Production

This course is a study of the management practices of field and greenhouse production of foliage and floral crops. Emphasis is placed on the commercial practices of purchasing, programming, cultural production, storage, handling, and sales of cut flowers and potted plant crops. The chain-of-life concept is discussed as it relates to the consumer's aesthetic use of cut flowers and plants. Lecture [2.00], Laboratory [3.00]. Credits 3

HRT-120 Interior Plantscaping

This course acquaints the student with interior plant materials, with emphasis on their cultural requirements, maintenance practices and key ornamental aspects. Basic business applications regarding installation and maintenance contracts are covered. Emphasis will be placed on selection of appropriate plants in environments calling for a balance of human needs and plant culture. Lecture [2.00], Laboratory [2.00]. Credits 3

HRT-124 Irrigation Technology

This is a course designed to expose students to landscape and turf equipment technology, system designs, installation and maintenance of a variety of irrigation types. Students will be involved with reading irrigation blueprints, troubleshooting potential problems and repair techniques. Lecture [1.00], Laboratory [2.00]. Credits 2

HRT-125 Equipment Management

This course introduces the student to the selection, proper use, maintenance and repair of power tools that are used in the lawn and tree care industries. Lecture topics will focus on the necessary information needed to make purchasing decisions as well as safety and proper use practices. The lab section provides the student with a hands-on approach to troubleshooting engine problems and a variety of repair options. Students will be required to present projects relating to their industry's equipment needs. Lecture [1.00], Laboratory [2.00]. Credits 2

HRT-130 Landscape Contracting

This course is a study of the basic requirements for developing landscape contracts and the writing of detailed specifications. Ethical practices and professional relationships among the client, consultant, contractor, other allied professions, and employees are also studied. Project costs and fee determination procedures are represented and simulated in the labs. Lecture [1.00], Laboratory [1.00]. Credits 1

HRT-204 Landscape Graphics

This course emphasizes the techniques for formulating, presenting, and drafting landscape designs. In addition, the basic design elements of planting, including form, texture, color, sequence of bloom, and ecological associations will be studied. Lecture [1.00], Laboratory [2.00]. Credits 2; Prerequisite HRT-113

HRT-213 Sustainable Design and Construction

This course is a continuation of the advancement of the student's design skills and practices. This course will place special emphasis on the ecological association of the land and plants. Students will develop landscape plans utilizing green technology while addressing the environment and topographical concerns of a site. Lecture [2.00], Laboratory [2.00]. Credits 3; Prerequisite HRT-113

HRT-214 Landscape Design and Building Capstone

This course will continue improving the student's design skills with a series of group projects using a variety of sites. Students will polish their presentation skills while solving problems and business management issues of increasing complexity. Off-campus visitations to design/build facilities and project sites will offer students additional insight into the day-to-day experience of working in the green industry. Lecture [2.00], Laboratory [2.00]. Credits 3; Prerequisite HRT-213

HRT-215 Landscape Design and Building Management

This course brings together the student's knowledge of both horticulture and business. Students will take a residential design and a project of their own choosing from start to finish, combining design with construction. Emphasis is on design and construction details, estimating, specifications, and contract documents. Lecture [2.00], Laboratory [2.00]. 3 Credits; Prerequisite HRT-213

HRT-232 Plant Propagation

This course is designed to familiarize the student with the techniques, facilities and materials needed for plant propagation in the greenhouse. Techniques of both vegetative and sexual reproduction of herbaceous and woody plants, as well as greenhouse crops and crops for the interior landscape are covered. Lecture [3.00], Laboratory [3.00]. Credits 4; Prerequisite HRT-102

HRT-233 Landscape Plants and Materials II

This course places emphasis on the identification, culture and use of both native and cultivated herbaceous materials used in the landscape and further continues with the identification and use of more specialized and unique woody plant materials. Laboratory and field exercises include studies and demonstrations of their applications and uses in both natural and designed settings. Lecture [3.00], Laboratory [3.00]. Credits 4; Prerequisite HRT-104

HRT-234 Commercial Floral Design Management

This course introduces the student to the production methods encountered in a commercial floral operation. Flower selection, basic and specialized supplies and their uses in all phases of the commercial operation will be discussed and demonstrated. In addition to designs of special occasion arrangements, students will be exposed to various marketing aspects of the floral industry including purchasing, sales and profitability. Lecture [3.00], Laboratory [3.00]. Credits 4; Prerequisite HRT-115

HRT-235 Landscape Analysis

This course acquaints the student with the different sites encountered by the landscape contractor, emphasizing appropriate planning in the development of both residential and commercial properties. Construction considerations will include drainage, irrigation, structures and the selection of materials. The integration of site analysis and construction materials in student projects will be stressed. Lecture [2.00], Laboratory [3.00]. Credits 3; Prerequisite HRT-104

HRT-236 Horticulture Marketing and Sales

This course introduces the student to concepts relating to preparation for a career in horticulture. Field studies into horticultural businesses, group discussions and consultations with industry professionals assist in formulating effective strategies and planning for a profitable business. Included are discussions of basic principles of marketing, current industry trends and sales. Lecture [3.00]. Credits – 3; Prerequisite HRT-101

HRT-237 Arboriculture and Plant Healthcare

This course is the study of the care of trees and woody plants. Emphasis is placed on pruning, pest control and proper cultural practices including planting procedures and fertilization schedules. Other important topics to be covered are the safety practices involved with tree climbing, pesticide application, and tree removal. The course will provide an understanding of the basic functions of woody plant systems. Lecture [2.00], Laboratory [3.00]. Credits 3

HRT-292 Co-Op Work Experience [Horticulture]

This course is a supervised work experience program which includes paid employment at an approved horticultural establishment and attendance at a weekly seminar. The course is designed to provide students with opportunities to learn and to practice skills under professional guidance. The area of placement will depend upon the student's background and interests. Job assistance is available through the Co-Op Office. Lecture [1.00], Cooperative [11.00]. Credits 2; Prerequisite 1 course from HRT

APPENDIX K: BCC BIOLOGY COURSES TAUGHT BY HORTICULTURE FACULTY

BIO-130 People-Plant Relationships

This course explores the effects of plants on biological organisms that influence human economic, social and psychological behavior. The course will focus on two major themes: 1] plants as sources of food, shelter, clothing, drugs, and industrial raw material; and 2] the influence of plant life on human cultural diversity, biotechnology, medicine, and conservation efforts. >General Education Course. Lecture [3.00], Laboratory [3.00]. **Credits 4**

BIO-131 General Botany

This course is an introduction to the biology of plants. The course includes an analysis of plant structure and function, an explanation of the principles of plant genetics, an exploration of plant evolution, and an examination of plant ecology. The importance of plants to people will be illustrated through discussions of people's ecological and economic dependence upon plants. The course content will be presented through lectures, demonstrations, and laboratory exercises. >General Education Course. Lecture [3.00], Laboratory [3.00]. **Credits 4**

BIO-217 Sustainability in Nature

Our Earth's systems, natural and human, are experiencing sudden and dramatic changes that challenge their sustainability. The principles and practices of sustainability need to be interdisciplinary so that current needs are met without compromising the needs of future generations. This course provides a fundamental knowledge of these topics and the balance of the multiple interactions. Discussions will include responsible environmental stewardship through the actions of individuals and of private & public sectors. Lecture [3.00], Laboratory [3.00] . General Education Course: **Credits 4; Prerequisite** BIO 108; BIO 130; or, BIO 131

APPENDIX L: BCC HORTICULTURE CURRICULUM MAPS

Bergen Community College

Curriculum Map: Horticulture: A.A.S. in Horticulture

Courses to Program/Discipline Level Student Learning Outcomes

Completion Date: October 6, 2013

The Associate in Applied Science Degree in Horticulture curriculum prepares students to achieve the expected student learning outcomes identified by the program or discipline. The following table demonstrates how learning activities in specific courses map to these learning outcomes.

KEY:

I – Introduced **R** – Reinforced and opportunity to practice **M** – Mastery at exit level [indicate how assessment evidence is collected]

Required Courses	Program/Discipline Student Learning Outcomes* - Part 1				
	Describe & apply landscape design elements & principles.	Analyze environmental needs for good plant growth.	Coordinate landscape plans, materials & installation for projects.	Know "Best Horticultural Practices" for many plants.	Demonstrate propagation materials & methods for many plants.
HRT- 101- Fund. Horticulture	I			I	
HRT- 102 - Plant Science		I		I	I
HRT- 103 – Turf & Grounds Mgmt.		R	R	R	
HRT- 104 – Landscape Plants & Mat. I	I	I		I	
HRT- 112 – Pest & the Ornamental Plant		R		R	
HRT- 113 – Principles of Landscaping	I	I		I	
HRT- 120 – Interior Plantscaping	R	I	R	I	
HRT- 204 –	M (project)	R	R		

Landscape Graphics					
HRT- 232 – Plant Propagation		R		R	R
HRT- 233 – Landscape Plants & Mat. II	R	R		R	
HRT- 236 – Hort. Mrkt. & Sales				R	
HRT- 462 – Co-Op Work Experience		M (intern)	R	M (intern)	
HRT - elective					

Adapted from Community College of Philadelphia's Curriculum Map template

Bergen Community College

Curriculum Map: Horticulture: A.A.S. in Landscape/Design/Build

Courses to Program/Discipline Level Student Learning Outcomes

Completion Date: October 6, 2013

The Associate in Applied Science Degree in Landscape/Design/Build curriculum prepares students to achieve the expected student learning outcomes identified by the program or discipline. The following table demonstrates how learning activities in specific courses map to these learning outcomes.

KEY:

I – Introduced **R** – Reinforced and opportunity to practice **M** – Mastery at exit level [indicate how assessment evidence is collected]

	Program/Discipline Student Learning Outcomes*				
	Describe & apply a site analysis for new or existing landscapes.	Coordinate landscape plans, materials & installation for projects.	Develop a budget and payment plan for each phase of a project.	Detail the landscape plants and hardscape materials & methods to be used in a project.	
Required Courses					
HRT- 102 - Plant Science	I			I	
HRT- 103 – Turf & Grounds Mgmt.	R	R			
HRT- 104 – Landscape Plants & Mat. I	I	I		I	
HRT- 113 – Principles of Landscaping	I	I		I	
HRT- 114 – Comp. App. for Landscape Design	R	I		R	
HRT- 130 – Landscape Contracting		I	I		
HRT- 204 – Landscape Graphics	R	RM (project)		M (project)	
HRT- 213 – Sustainable	M (project)	RM (project)		M (project)	

Design & Construction					
HRT- 214 – Landscape Design/Build Capstone	M (project)	M (project)	M (project)	M (project)	
HRT- 215 – Landscape Design/Build Mgmt.	M (exam)	M (exam)	M (exam)	M (exam)	
HRT- 233 – Landscape Plants & Mat. II	R			R	
HRT- 235 – Landscape Site Analysis	R			R	
HRT- 236 – Hort. Mrkt. & Sales			R	R	
HRT- 462 – Co-Op Work Experience	R	RM (intern)	M (intern)	M (intern)	
HRT - elective					

Adapted from Community College of Philadelphia's Curriculum Map template

Bergen Community College

Curriculum Map: Horticulture: Certificate in Floral Design

Courses to Program/Discipline Level Student Learning Outcomes

Completion Date: October 6, 2013

The Certificate in Floral Design curriculum prepares students to achieve the expected student learning outcomes identified by the program or discipline. The following table demonstrates how learning activities in specific courses map to these learning outcomes.

KEY:

I – Introduced **R** – Reinforced and opportunity to practice **M** – Mastery at exit level [indicate how assessment evidence is collected]

Required Courses	Program/Discipline Student Learning Outcomes*				
	Identify common cut flowers, greens & supplies of florist industry.	Identify common tropical & holiday plants of florist industry.	Construct basic designs for holiday and special events.	Discuss & demonstrate elements & principles of floral design.	Handle & process cut flowers & greens under best mgmt. practices.
HRT- 102 - Plant Sci.	I	I			I
HRT- 115 – Floral Design	I	I	I	I	I
HRT- 119 – Grhs. Operation & Prod.	R	R			R
HRT- 120 – Interior Landscaping	I	R	IR		
HRT- 232 – Plant Propagation	R	R			R
HRT- 234 – Comm. Floral Des. Mgmt.	M (intern)	M (intern)	M (intern)	M (intern)	M (intern)
HRT- 462 – Co-Op Work Experience	RM (intern)	RM (intern)	M (intern)	R	M (intern)
BUS. elective					

Bergen Community College

Curriculum Map: Horticulture: Certificate in Grounds Management

Courses to Program/Discipline Level Student Learning Outcomes

Completion Date: October 6, 2013

The Certificate in Grounds Management curriculum prepares students to achieve the expected student learning outcomes identified by the program or discipline. The following table demonstrates how learning activities in specific courses map to these learning outcomes.

KEY: *I* – Introduced *R* – Reinforced and opportunity to practice *M* – Mastery at exit level [indicate how assessment evidence is collected]

Required Courses	Program/Discipline Student Learning Outcomes*				
	Identify major insect, disease and abiotic disorders affecting plants in landscape & turf.	Analyze sites for existing & potential problems of plants and surrounding areas.	Collect soil samples & analyze them to determine changes for landscape & turf plant needs.	Consult on pruning practices for shrub & tree care.	Coordinate sub-contracted services as necessary.
HRT- 102 - Plant Sci.		I	I	I	
HRT- 103 – Turf & Grounds Mgmt.	R	R			R
HRT- 104 – Landscape Plants & Mat. I	I	I			
HRT- 112 – Plant Pests	R	R		R	
HRT- 124 – Irrig. Tech.	IR	IR			
HRT- 125 – Equip. Mgmt.				IR	IR
HRT- 130 – Land. Cont.		I		I	
HRT- 235 – Site Analysis		R	R	R	
HRT- 237 - Arboriculture	M (exam)	M (exam)		M (exam)	
HRT - elective					

Adapted from Community College of Philadelphia's Curriculum Map template

Bergen Community College

Curriculum Map: Horticulture: Certificate in Landscape

Courses to Program/Discipline Level Student Learning Outcomes

Completion Date: October 6, 2013

The Certificate in Landscape curriculum prepares students to achieve the expected student learning outcomes identified by the program or discipline. The following table demonstrates how learning activities in specific courses map to these learning outcomes.

KEY: *I* – Introduced *R* – Reinforced and opportunity to practice *M* – Mastery at exit level [indicate how assessment evidence is collected]

Required Courses	Program/Discipline Student Learning Outcomes*				
	Conduct site & family needs analysis for residential site.	Identify & offer design solutions to drainage & other site issues.	Develop concept through final draft plans for site.	Create functional & aesthetic landscapes using plant groups & materials.	Coordinate landscape plans & materials through permits, installation & inspections.
BUS – 101 – Intro. Bus.					I
DFT – 107 – Drafting I					I
HRT- 103 – Turf & Grounds Mgmt.	R	R	R		
HRT- 113 – Principles of Landscaping	I	I		I	
HRT- 204 – Landscape Graphics	R	M (project)		RM (exam)	
HRT- 233 – Landscape Plants & Mat. II				R	
HRT- 235 – Site Analysis & Constr.	R	R	R		R
HRT - elective					
INF – 101 – Info. Tech.					I

Adapted from Community College of Philadelphia's Curriculum Map template

APPENDIX M: HORTICULTURE ASSESSMENT REPORTS 2016-2018

Bergen Community College

ASSESSMENT REPORT FORM FOR ACADEMIC PROGRAM

Assessment Period: Fall 2016-Spring 2018

Department/Program: Biology and Horticulture Department/ Horticulture Program (AAS.ST.HORT)

Department Chair: Professor Bob Highley

Department Assessment Liaison: Professor Linda Wiles

Date Submitted: May 29, 2017

❖ **Program Description or mission/outcome statement of the Department/Program:**

The Horticulture Program Mission Statements for our students include:

- Training in the art, science & business of the ornamental plant industries.
- Fostering professionalism and entrepreneurship.
- Encouraging creative problem-solving.
- Promoting teamwork and individual effort.
- Providing opportunities for hands-on learning.
- Encouraging and responding to student input.
- Developing abilities to research, evaluate and organize information to present their findings before teachers, peers, employers or clients.

This Outcomes Assessment aligns with all of the outcomes for our Mission Statements for our students.

❖ **Program Learning Outcomes:**

Career Technologies AAS – Science Technology, Horticulture Degree; Code: AAS.ST.HORT

The two-year Horticulture option prepares students for employment in horticulture based on hands-on training in a wide range of topics that can lead directly to employment in horticulture or to a four-year program. Topics include science, art and business aspects such as: plant science, propagation, turf, pests, design, marketing, plant materials, etc.

Program Learning Outcomes

- Describe and demonstrate the elements and principles of design utilized for a landscape site.
- Conduct an analysis of the environmental concerns for good plant growth at an interior and/or exterior landscaped site.

- Coordinate the process of preparing a plan, specifying materials to be used and the installation of those materials on a landscaped site.
- Prescribe the “Best Horticultural Practices” for a wide variety of interior and exterior plant materials used in the ornamental industries.
- Demonstrate the materials and methods used for the propagation of a wide variety of ornamental crops.
- Discuss the anatomy and physiology of a plant at an industry-needs level.
- Identify the biotic and abiotic problems associated with the maintenance of a wide range of interior and exterior plant materials used in the ornamental industries.
- Collect a soil sample for analysis of the structure, texture, pH and nutrient content so a determination can be made to add amendments to the soil or to apply a chemical treatment.
- Discuss the marketing and sale of the aesthetic and environmentally achieved results of a design.

This Outcomes Assessment aligns with the underlined outcomes for this program.

SEMESTER 1: CREATING PROGRAM-LEVEL ASSESSMENT PLAN

1. Program Learning Outcome(s) to be assessed (from the above section):

Career Technologies AAS – Science Technology, Horticulture Degree; Code: AAS.ST.HORT

Program Learning Outcomes

Conduct an analysis of the environmental concerns for good plant growth at an interior and/or exterior landscaped site.

Fall 2016 Qualitative Results Examples:

“Earlier this year one of the guys I work with took the left over sweet potato plants that was removed from a flower bed that was being redesigned and cut it up and rooted it in his garden.” M.S. 11/22/16

“Brought in the ‘will freeze outside’ plants and transplanted for indoor keep & use. Replanted (them) in different forms.” A.G. 10/27/16

The Fall 2016 qualitative results examples were selected from essays written by students on self-selected topics throughout the semester. Key examples were selected as representative of one or more learning outcomes.

2. Means of Assessment:

The assessment project will be a daily (during class) series of observational essays (DOE) related to the class content. This is an extension of my Research Based Professional Development (RBDP) that focused on the multiple benefits of writing across the curriculum and regular observations of nature.

In Fall 2016, the assessment was on the Plant Propagation class, which had one section that semester.

- **Feedback from Dean:** Assessment plan seems to be very well thought out and appropriate for the academic program.

SEMESTER 2: DEVELOPING ASSESSMENT TOOL (s) and TIMELINE

3A. Describe or attach assessment tool (s), including sources of data, timeline for data collection and how data will be analyzed.

In Spring 2017 the Plant Science class was evaluated as originally planned.

Spring 2017 Qualitative Results Examples:

"I did not know plants could get sunburned so after leaving it (spider plant) inside all winter I left it out for a day and now it's almost dead." G.H. 5/9/17

"Moodus, Connecticut is a great place to be surrounded by nature. . . . It's amazing how much going on in an object (tree) that doesn't speak. I visited my mom this past weekend and laid in the soft, mossy grass and was completely content besides worrying about ticks." V.L. 5/9/17

In Spring 2017 qualitative results examples were selected from student essays targeted to one of several learning outcomes for their final essay.

Original Timeline: Data will be collected in each semester for one Horticulture class. As the class evaluated will change from semester to semester, specific guidelines will apply relative to the focus of the class. For example, in Semester 1 (Fall 2016), Plant Propagation was evaluated, with an emphasis on opportunities for propagating, observations of propagating, etc. In Semester 2 (Spring 2017), Plant Science is being evaluated, with a more general emphasis on any type of plant related observation. In Semester 3 (Fall 2017), Pests of Ornamental Plants will likely be evaluated, with an emphasis on observations of pests, diseases, abiotic problems of plants. In Semester 4 (Spring 2018), Plant Propagation will likely be evaluated again, with the same criteria as before. The data will be evaluated in the following semester. Results will be organized both quantitatively and qualitatively.

The primary assignment is to write about and illustrate (storyboard) a direct observation about plants that was made prior to each class. There are two variations on this, the first essay is to be an historical one including one or more other people, and the last essay is to summarize the development of their observational skills over the semester.

Grading criteria include a baseline for doing each assignment, with additional points based on demonstrating greater observational skill, more detailed description, and higher level perception.

Criteria	Exceeds Standard	Meets Standard	Nearly Meets Standard	Does Not Meet Standard
Observational skill	Shows deep knowledge & understanding	Relates learning to class material or some personal reflection	Some general knowledge or understanding	Minimal general knowledge or understanding evident
Detailed description, verbal or illustrative	Logical sequence of description and expansion on the experience	Presents more details, though not perfected	Organizes some details, may be missing illustration	Minimal or no description
Higher level perception	Abstract reasoning or potential research or business related ideas expressed	Average insight	Limited insight	Not applicable
Overview for course length	Substantial observational skills as noted above, either throughout the course, or by the end of the course	Some improvement as noted above	Limited improvement as noted above	No progression in observational skills

3B. Desired results faculty would like to see.

The results are directed toward the ability of students to analyze environmental concerns for plant growth at an interior and/or external landscaped site.

It is expected that 75% of students achieve a mastery level of 90% or higher. Also, 90% of students would score 70% or above.

Fall 2016, 15 students taking the Plant Propagation class scored an average of 91.3%, with a range of 70-110%; 80% of the students scored 90% or higher.

Spring 2017, 10 students taking the Plant Science class scored an average of 90%, with a range of 80-101%; 50% of the students scored 90% or higher.

In collecting the Spring 2017 data, it was observed that there appears to be a strong relationship between final grades and DOE assignment grades, students scored an average of 95% on their semester DOE essays, with a range of 82-109%. There is not a complete correlation, sometimes students did better on final grades than on DOE grades, sometimes the reverse.

- **Feedback from CIE:**

- Linda, you have identified a PLO for this assessment project and developed a general rubric, which assists in the assessment of observational skills, perception, the students' ability to include details, etc. In order to better align the rubric with the targeted PLO and bring more attention to the content of the observational essays, I recommend specific language that reflects the PLOs you identified in the first semester. For example, instead of, "Shows deep understanding", include the content of the PLO In the rubric, "Shows deep understanding of how to conduct an analysis of the environmental concerns for good plant growth at an interior and/or exterior landscaped site." In other words, include the content you are assessing within the grading criteria.
- The desired results you describe will be yield useful data for assessing if the PLO has been mastered by a substantial amount of students.
- Additionally, your preliminary findings described in the last paragraph above, though interesting, do not relate to the targeted PLO, which should remain the focus of this project.
- (On page 1 of this report, 3 PLOs are underlined, though only one PLO is the focus of this project.)

SEMESTER 3: COLLECTING AND ANALYZING DATA

4. Summary of Results (attach aggregated data table, survey tool, etc., to support the summary)

5. Recommendations for Improvement:

- **Feedback from Dean:**

SEMESTER 4: CLOSING THE LOOP AND SHARING KNOWLEDGE

6. Use of Results:

- **Feedback from CIE:**

Bergen Community College

ASSESSMENT REPORT FORM FOR ACADEMIC PROGRAM

Assessment Period: Fall 2016-Spring 2018

Department/Program: Biology & Horticulture Department/ Horticulture Program (AAS.ST.LAND)

Department Chair: Professor Bob Highley

Department Assessment Liaison: Professor Linda Wiles

Date Submitted: May 29, 2017

❖ **Program Description or mission/outcome statement of the Department/Program:**

The Horticulture Program Mission Statements for our students include:

- Training in the art, science & business of the ornamental plant industries.
- Fostering professionalism and entrepreneurship.
- Encouraging creative problem-solving.
- Promoting teamwork and individual effort.
- Providing opportunities for hands-on learning.
- Encouraging and responding to student input.
- Developing abilities to research, evaluate and organize information to present their findings before teachers, peers, employers or clients.

This Outcomes Assessment aligns with all of the outcomes for our Mission Statements for our students.

❖ **Program Learning Outcomes:**

**Career Technologies AAS – Science Technology, Horticulture – Landscape/Design/Build Option Degree;
Code: AAS.ST.LAND**

The two-year Landscape Design/Build option provides students with a set of knowledge, skills and abilities that prepares them for direct employment in the landscape design field. It includes sustainable design and construction, management and development of presentation skills.

Program Learning Outcomes

- Describe a site analysis of a new or existing landscape and evaluate the removal or transplanting of existing plant materials.

- Prepare a conceptual, preliminary and final copy plan complete with a detailed Plant Materials List, Construction Materials to be used and the Order of Occurrence for implementation of the design.
- Develop a budget for each phase of project and propose a payment plan for project.
- Explain in detail the materials and methods to be used with both plant and construction materials.

This Outcomes Assessment aligns with the underlined outcomes for this program.

SEMESTER 1: CREATING PROGRAM-LEVEL ASSESSMENT PLAN

3. Program Learning Outcome(s) to be assessed (from the above section):

**Career Technologies AAS – Science Technology, Horticulture – Landscape/Design/Build Option Degree;
Code: AAS.ST.LAND**

Program Learning Outcomes

- Describe a site analysis of a new or existing landscape and evaluate the removal or transplanting of existing plant materials.

Fall 2016 Qualitative Results Examples:

"I noticed their magnolia tree was producing seed from pink cone-like pods. The seed were bright red and were popping out of the dried up pods. I read that to propagate them you have to soak them for "x" amount of time." M.S. 10/13/16

"Brought in the 'will freeze outside' plants and transplanted for indoor keep & use. Replanted (them) in different forms." A.G. 10/27/16

The Fall 2016 qualitative results examples were selected from essays written by students on self-selected topics throughout the semester. Key examples were selected as representative of one or more learning outcomes.

4. Means of Assessment:

The assessment project will be a daily (during class) series of observational essays (DOE) related to the class content. This is an extension of my Research Based Professional Development (RBPd) that focused on the multiple benefits of writing across the curriculum and regular observations of nature. The instructional strategies of *Writing Across the Curriculum* coupled with the experiential learning experience of students' formal observations in nature are effective and beneficial for student learning.

In Fall 2016, the assessment was on the Plant Propagation class, which had one section that semester.

- **Feedback from Dean:** Assessment plan seems to be very well thought out and appropriate for the academic program.

SEMESTER 2: DEVELOPING ASSESSMENT TOOL (s) and TIMELINE

3A. Describe or attach assessment tool (s), including sources of data, timeline for data collection and how data will be analyzed.

In Spring 2017 the Plant Science class was evaluated as originally planned.

Spring 2017 Qualitative Results Examples:

"Today over in Harrington Park I made new flower beds and then planted new flowers and shrubs. Along the house I planted boxwoods while along the fence I planted Begonias." S.L. 5/9/17

"While walking on the golf course I observed a random tree with bunches of white flowers. I don't know its name, but it reminded me of the simpleness, the love of all plants that surround us all the time." M.M. 5/9/17

In Spring 2017 qualitative results examples were selected from student essays targeted to one of several learning outcomes for their final essay.

Original Timeline: Data will be collected in each semester for one Horticulture class. As the class evaluated will change from semester to semester, specific guidelines will apply relative to the focus of the class. For example, in Semester 1 (Fall 2016), Plant Propagation was evaluated, with an emphasis on opportunities for propagating, observations of propagating, etc. In Semester 2 (Spring 2017), Plant Science is being evaluated, with a more general emphasis on any type of plant related observation. In Semester 3 (Fall 2017), Pests of Ornamental Plants will likely be evaluated, with an emphasis on observations of pests, diseases, abiotic problems of plants. In Semester 4 (Spring 2018), Plant Propagation will likely be evaluated again, with the same criteria as before. The data will be evaluated in the following semester. Results will be organized both quantitatively and qualitatively.

The primary assignment is to write about and illustrate (storyboard) a direct observation about plants that was made prior to each class. There are two variations on this, the first essay is to be an historical one including one or more other people, and the last essay is to summarize the development of their observational skills over the semester.

Grading criteria include a baseline for doing each assignment, with additional points based on demonstrating greater observational skill, more detailed description, and higher level perception.

Criteria	Exceeds Standard	Meets Standard	Nearly Meets Standard	Does Not Meet Standard
Observational skill	Shows deep knowledge & understanding	Relates learning to class material or some personal reflection	Some general knowledge or understanding	Minimal general knowledge or understanding evident
Detailed description, verbal or illustrative	Logical sequence of description and expansion on the experience	Presents more details, though not perfected	Organizes some details, may be missing illustration	Minimal or no description
Higher level perception	Abstract reasoning or potential research or business related ideas expressed	Average insight	Limited insight	Not applicable
Overview for course length	Substantial observational skills as noted above, either throughout the course, or by the end of the course	Some improvement as noted above	Limited improvement as noted above	No progression in observational skills

3B. Desired results faculty would like to see.

The results are directed toward site analysis and the removal or transplanting of existing plants in a landscape.

It is expected that 75% of students achieve a mastery level of 90% or higher. Also, 90% of students would score 70% or above.

Fall 2016, 15 students taking the Plant Propagation class scored an average of 91.3%, with a range of 70-110%; 80% of the students scored 90% or higher.

Spring 2017, 10 students taking the Plant Science class scored an average of 90%, with a range of 80-101%; 50% of the students scored 90% or higher.

In collecting the data it was observed that there appears to be a strong relationship between final grades and DOE assignment grades, students scored an average of 95% on their semester DOE essays, with a range of 82-109%. There is not a complete correlation, sometimes students did better on final grades than on DOE grades, sometimes the reverse.

- **Feedback from CIE:**

- Linda, you have identified a PLO for this assessment project and developed a general rubric, which assists in the assessment of observational skills, perception, the students' ability to include details, etc. In order to better align the rubric with the targeted PLO and bring more attention to the content of the observational essays, I recommend specific language that reflects the PLOs you identified in the first semester. For example, instead of, "Shows deep understanding", include the content of the PLO. In the rubric, "Shows deep understanding of Describe a site analysis of a new or existing landscape and evaluate the removal or transplanting of existing plant materials. In other words, include the content you are assessing within the grading criteria.
- As I suggested in my preliminary feedback, earlier in the semester, including specific grading criteria related to the content related to the PLO, would assist in the assessment of the PLO you identified.
- The desired results you describe will be yield useful data for assessing if the PLO has been mastered by a substantial amount of students.
- Additionally, your preliminary findings described in the last paragraph above, though interesting, do not relate to the assessment of the PLO, which should remain the focus of this project.

SEMESTER 3: COLLECTING AND ANALYZING DATA

4. Summary of Results (attach aggregated data table, survey tool, etc., to support the summary)

5. Recommendations for Improvement:

- **Feedback from Dean:**

SEMESTER 4: CLOSING THE LOOP AND SHARING KNOWLEDGE

6. Use of Results:

- **Feedback from CIE:**

Bergen Community College

ASSESSMENT REPORT FORM FOR ACADEMIC PROGRAM

Assessment Period: Fall 2016-Spring 2018

Department/Program: Biology and Horticulture Department/ Horticulture Program (CERT.FLORAL)

Department Chair: Professor Bob Highley

Department Assessment Liaison: Professor Linda Wiles

Date Submitted: May 29, 2017

❖ **Program Description or mission/outcome statement of the Department/Program:**

The Horticulture Program Mission Statements for our students include:

- Training in the art, science & business of the ornamental plant industries.
- Fostering professionalism and entrepreneurship.
- Encouraging creative problem-solving.
- Promoting teamwork and individual effort.
- Providing opportunities for hands-on learning.
- Encouraging and responding to student input.
- Developing abilities to research, evaluate and organize information to present their findings before teachers, peers, employers or clients.

This Outcomes Assessment aligns with all of the outcomes for our Mission Statements for our students.

❖ **Program Learning Outcomes:**

Floral Design Certificate [30-36 credit]; Code: CERT.FLORAL

Students taking the Floral Design Certificate are exposed to the materials and creative processes of the florist and interior landscaping industries. The role that both the physical and environmental setting has on the elements of design (color, texture and form) and aesthetic considerations are dealt with in laboratory and lecture projects.

Program Learning Outcomes

- Identify the commonly used cut flowers, greens and supplies used in the floral industry.
- Identify the common tropical plants and holiday plants used in the floral industry.
- Construct the basic designs (e.g. centerpieces, arrangements, corsages etc.) for holiday and special events.

- Discuss and demonstrate the elements and principles of design used by the floral industry.
- Handle and process cut flowers and greens under accepted industry practices.

This Outcomes Assessment aligns with the underlined outcomes for this program.

SEMESTER 1: CREATING PROGRAM-LEVEL ASSESSMENT PLAN

5. Program Learning Outcome(s) to be assessed (from the above section):

Floral Design Certificate [30-36 credit]; Code: CERT.FLORAL

Program Learning Outcomes

- Identify the commonly used cut flowers, greens and supplies used in the floral industry.

Fall 2016 Qualitative Results Examples:

"...we had to remove bamboo from someone's yard. When we got back to our yard to dump it I took a few pieces with me and stuck them in a water bottle to see if it would root or grow. After some time it rooted..." M.S. 9/22/16

"Took babies out of the aloe & put them in another pot. Many babies & teenagers growing; they needed space." A.G. 12/1/16

The Fall 2016 qualitative results examples were selected from essays written by students on self-selected topics throughout the semester. Key examples were selected as representative of one or more learning outcomes.

6. Means of Assessment:

The assessment project will be a daily (during class) series of observational essays related to the class content. This is an extension of my Research Based Professional Development (RBPd) that focused on the multiple benefits of writing across the curriculum and regular observations of nature.

In Fall 2016, the assessment was on the Plant Propagation class, which had one section that semester.

- **Feedback from Dean:** Assessment plan seems to be very well thought out and appropriate for the academic program.

SEMESTER 2: DEVELOPING ASSESSMENT TOOL (s) and TIMELINE

3A. Describe or attach assessment tool (s), including sources of data, timeline for data collection and how data will be analyzed.

In Spring 2017 the Plant Science class was evaluated as originally planned.

Spring 2017 Qualitative Results Examples:

"Lily-of-the-Valley are in full bloom – a neighbor has a large batch and can smell its scent several feet before you reach it. May 1 – Labor Day in France – small bouquets of the flower are exchanged among workers." I.R.. 5/9/17

"In the fall I had planted some kale which had sat through the winter until I cut them at the stem. Being a perennial they have already started growing into a new kale plant. While it is only green now, it had deep dark colors when it was planted originally." P.M. 5/9/17

In Spring 2017 qualitative results examples were selected from student essays targeted to one of several learning outcomes for their final essay.

Original Timeline: Data will be collected in each semester for one Horticulture class. As the class evaluated will change from semester to semester, specific guidelines will apply relative to the focus of the class. For example, in Semester 1 (Fall 2016), Plant Propagation was evaluated, with an emphasis on opportunities for propagating, observations of propagating, etc. In Semester 2 (Spring 2017), Plant Science is being evaluated, with a more general emphasis on any type of plant related observation. In Semester 3 (Fall 2017), Pests of Ornamental Plants will likely be evaluated, with an emphasis on observations of pests, diseases, abiotic problems of plants. In Semester 4 (Spring 2018), Plant Propagation will likely be evaluated again, with the same criteria as before. The data will be evaluated in the following semester. Results will be organized both quantitatively and qualitatively.

The primary assignment is to write about and illustrate (storyboard) a direct observation about plants that was made prior to each class. There are two variations on this, the first essay is to be an historical one including one or more other people, and the last essay is to summarize the development of their observational skills over the semester.

Grading criteria include a baseline for doing each assignment, with additional points based on demonstrating greater observational skill, more detailed description, and higher level perception.

Criteria	Exceeds Standard	Meets Standard	Nearly Meets Standard	Does Not Meet Standard
Observational skill	Shows deep knowledge & understanding	Relates learning to class material or some personal reflection	Some general knowledge or understanding	Minimal general knowledge or understanding evident
Detailed description, verbal or illustrative	Logical sequence of description and expansion on the experience	Presents more details, though not perfected	Organizes some details, may be missing illustration	Minimal or no description
Higher level perception	Abstract reasoning or potential research or business related ideas expressed	Average insight	Limited insight	Not applicable
Overview for course length	Substantial observational skills as noted above, either throughout the course, or by the end of the course	Some improvement as noted above	Limited improvement as noted above	No progression in observational skills

3B. Desired results faculty would like to see.

The results are directed toward the ability of students to identify commonly used plant materials and supplies used in the floral industry.

It is expected that 75% of students achieve a mastery level of 90% or higher. Also, 90% of students would score 70% or above.

Fall 2016, 15 students taking the Plant Propagation class scored an average of 91.3%, with a range of 70-110%; 80% of the students scored 90% or higher.

Spring 2017, 10 students taking the Plant Science class scored an average of 90%, with a range of 80-101%; 50% of the students scored 90% or higher.

In collecting the data it was observed that there appears to be a strong relationship between final grades and DOE assignment grades, students scored an average of 95% on their semester DOE essays, with a range of 82-109%. There is not a complete correlation, sometimes students did better on final grades than on DOE grades, sometimes the reverse.

- **Feedback from CIE:**

Please see the feedback I provided for your AAS.ST.HORT and AAS.ST.LAND reports. I would suggest that five programs with similar and replicated PLOs would benefit from differentiation of Program Learning Goals, course assignments, students' outcomes or If programs are indeed as similar as they seem, can they be consolidated, yielding stronger programs?

SEMESTER 3: COLLECTING AND ANALYZING DATA

4. Summary of Results (attach aggregated data table, survey tool, etc., to support the summary)

5. Recommendations for Improvement:

- **Feedback from Dean:**

SEMESTER 4: CLOSING THE LOOP AND SHARING KNOWLEDGE

6. Use of Results:

- **Feedback from CIE:**

Bergen Community College

ASSESSMENT REPORT FORM FOR ACADEMIC PROGRAM

Assessment Period: Fall 2016-Spring 2018

Department/Program: Biology and Horticulture Department/ Horticulture Program (CERT.GRND.MGT)

Department Chair: Professor Bob Highley

Department Assessment Liaison: Professor Linda Wiles

Date Submitted: May 29, 2017

❖ **Program Description or mission/outcome statement of the Department/Program:**

The Horticulture Program Mission Statements for our students include:

- Training in the art, science & business of the ornamental plant industries.
- Fostering professionalism and entrepreneurship.
- Encouraging creative problem-solving.
- Promoting teamwork and individual effort.
- Providing opportunities for hands-on learning.
- Encouraging and responding to student input.
- Developing abilities to research, evaluate and organize information to present their findings before teachers, peers, employers or clients.

This Outcomes Assessment aligns with all of the outcomes for our Mission Statements for our students.

❖ **Program Learning Outcomes:**

Grounds Management Certificate [30-36 credit]; Code: CERT.GRND.MGT

The student of our Grounds Management Certificate understands the function of various plant types (e.g. grasses, shrubs, trees, herbaceous plants) and the cultural needs of these for sustainably dealing with soils, water, fertilizer, pruning, pest control, planting and more. A hands-on educational approach is given to each student with designed projects for them to fulfill on campus.

Program Learning Outcomes

- Identify the major insect, disease, nutritional and physiological disorders that effect plant growth.
- Conduct a site analysis of the existing and potential problems to the plants and surrounding items and areas.
- Take a soil sample and remedy any deficiencies, abnormal pH levels or nutritional concerns

- Manage the turf area for weeds, insects, diseases and nutrient needs.
- Consult on pruning practices appropriate for shrub and tree care.
- Coordinate sub contracted services necessary to the site.

This Outcomes Assessment aligns with the underlined outcomes for this program.

SEMESTER 1: CREATING PROGRAM-LEVEL ASSESSMENT PLAN

7. Program Learning Outcome(s) to be assessed (from the above section):

Grounds Management Certificate [30-36 credit]; Code: CERT.GRND.MGT

Program Learning Outcomes

- Conduct a site analysis of the existing and potential problems to the plants and surrounding items and areas.

Fall 2016 Qualitative Results Examples:

"I learned quickly that wisteria can take root fairly easy as I see wisteria vines flowering every year in the trees (where we had thrown clippings.)" M.S. 9/15/16

"(I) was up a tree, trimming it, leaving the leaves for mulch. Keeping the soil warm for next year's growth, never an afterthought." A.G. 10/6/16

The Fall 2016 qualitative results examples were selected from essays written by students on self-selected topics throughout the semester. Key examples were selected as representative of one or more learning outcomes.

8. Means of Assessment:

The assessment project will be a daily (during class) series of observational essays related to the class content. This is an extension of my Research Based Professional Development (RBDP) that focused on the multiple benefits of writing across the curriculum and regular observations of nature.

In Fall 2016, the assessment was on the Plant Propagation class, which had one section that semester.

- **Feedback from Dean:** Assessment plan seems to be very well thought out and appropriate for the academic program.

SEMESTER 2: DEVELOPING ASSESSMENT TOOL (s) and TIMELINE

3A. Describe or attach assessment tool (s), including sources of data, timeline for data collection and how data will be analyzed.

In Spring 2017 the Plant Science class was evaluated as originally planned.

Spring 2017 Qualitative Results Examples:

"Over the weekend I went to my grandma's house for an early Mother's Day. In her yard she has crabapple trees. We picked a couple small ones off and she never knew what the tree was. I told her that they were edible just how they were and her and my grandpa both really liked them! The white flowers made a mess of their lawn, but now they have a tree they can eat off of." D.H. 5/9/17

"I recently learned that columbine is a pink, star-shaped flower with a sweet, soft smell. We have several sitting in pots for sale, but I found one growing near our hoses behind the garage. There's a lot to say for how much it takes to make something grow, but even more about how plants persevere in the conditions they begin with. All the columbine in their pots are budding, but this one was already fully grown. S.P. 5/9/17

In Spring 2017 qualitative results examples were selected from student essays targeted to one of several learning outcomes for their final essay.

Original Timeline: Data will be collected in each semester for one Horticulture class. As the class evaluated will change from semester to semester, specific guidelines will apply relative to the focus of the class. For example, in Semester 1 (Fall 2016), Plant Propagation was evaluated, with an emphasis on opportunities for propagating, observations of propagating, etc. In Semester 2 (Spring 2017), Plant Science is being evaluated, with a more general emphasis on any type of plant related observation. In Semester 3 (Fall 2017), Pests of Ornamental Plants will likely be evaluated, with an emphasis on observations of pests, diseases, abiotic problems of plants. In Semester 4 (Spring 2018), Plant Propagation will likely be evaluated again, with the same criteria as before. The data will be evaluated in the following semester. Results will be organized both quantitatively and qualitatively.

The primary assignment is to write about and illustrate (storyboard) a direct observation about plants that was made prior to each class. There are two variations on this, the first essay is to be an historical one including one or more other people, and the last essay is to summarize the development of their observational skills over the semester.

Grading criteria include a baseline for doing each assignment, with additional points based on demonstrating greater observational skill, more detailed description, and higher level perception.

Criteria	Exceeds Standard	Meets Standard	Nearly Meets Standard	Does Not Meet Standard
Observational skill	Shows deep knowledge & understanding	Relates learning to class material or some personal reflection	Some general knowledge or understanding	Minimal general knowledge or understanding evident
Detailed description, verbal or illustrative	Logical sequence of description and expansion on the experience	Presents more details, though not perfected	Organizes some details, may be missing illustration	Minimal or no description
Higher level perception	Abstract reasoning or potential research or business related ideas expressed	Average insight	Limited insight	Not applicable
Overview for course length	Substantial observational skills as noted above, either throughout the course, or by the end of the course	Some improvement as noted above	Limited improvement as noted above	No progression in observational skills

3B. Desired results faculty would like to see.

The results are directed to site analysis and problem identification.

It is expected that 75% of students achieve a mastery level of 90% or higher. Also, 90% of students would score 70% or above.

Fall 2016, 15 students taking the Plant Propagation class scored an average of 91.3%, with a range of 70-110%; 80% of the students scored 90% or higher.

Spring 2017, 10 students taking the Plant Science class scored an average of 90%, with a range of 80-101%; 50% of the students scored 90% or higher.

In collecting the data it was observed that there appears to be a strong relationship between final grades and DOE assignment grades, students scored an average of 95% on their semester DOE essays, with a range of 82-109%. There is not a complete correlation, sometimes students did better on final grades than on DOE grades, sometimes the reverse.

- **Feedback from CIE:**

- Please see the feedback I provided for your AAS.ST.HORT and AAS.ST.LAND reports. I would suggest that five programs with similar and replicated PLOs would benefit from differentiation of Program Learning Goals, course assignments, students' outcomes or If programs are indeed as similar as they seem, can they be consolidated, yielding stronger programs?

SEMESTER 3: COLLECTING AND ANALYZING DATA

4. Summary of Results (attach aggregated data table, survey tool, etc., to support the summary)

5. Recommendations for Improvement:

- **Feedback from Dean:**

SEMESTER 4: CLOSING THE LOOP AND SHARING KNOWLEDGE

6. Use of Results:

- **Feedback from CIE:**

Bergen Community College

ASSESSMENT REPORT FORM FOR ACADEMIC PROGRAM

Assessment Period: Fall 2016-Spring 2018

Department/Program: Biology and Horticulture Department/ Horticulture Program (CERT.LAND)

Department Chair: Professor Bob Highley

Department Assessment Liaison: Professor Linda Wiles

Date Submitted: May 29, 2017

❖ **Program Description or mission/outcome statement of the Department/Program:**

The Horticulture Program Mission Statements for our students include:

- Training in the art, science & business of the ornamental plant industries.
- Fostering professionalism and entrepreneurship.
- Encouraging creative problem-solving.
- Promoting teamwork and individual effort.
- Providing opportunities for hands-on learning.
- Encouraging and responding to student input.
- Developing abilities to research, evaluate and organize information to present their findings before teachers, peers, employers or clients.

This Outcomes Assessment aligns with all of the outcomes for our Mission Statements for our students.

❖ **Program Learning Outcomes:**

Landscaping Certificate [30-36 credit]; Code: CERT.LAND

Students enrolled in the Landscape Certificate are exposed to the plants and construction materials utilized to transform a new or existing site for functional and/or aesthetic needs. Students study a site, prepare a plan, and implement a project on campus as one of the laboratory components. They demonstrate the design principles they have learned to resolve problems in the everyday world of landscaping (drainage, topography, exposure, sustainability, etc.).

Program Learning Outcomes

- Conduct a site analysis and family inventory analysis for a residential landscape site.
- Identify and propose solutions to the drainage and site problems that need to be rectified by the design.
- Develop conceptual, preliminary and final copy plans for the site.
- Formulate a functional and/or aesthetic group of plants and materials that best suits the environment and the client's needs.

- Organize the various phases of implementing the design, from permits to final inspections.

SEMESTER 1: CREATING PROGRAM-LEVEL ASSESSMENT PLAN

9. Program Learning Outcome(s) to be assessed (from the above section):

Landscaping Certificate [30-36 credit]; Code: CERT.LAND

Program Learning Outcomes

- Conduct a site analysis and family inventory analysis for a residential landscape site.

Fall 2016 Qualitative Results Examples:

"Some of the grasses on one of our jobsites grew a little out of control so we pulled them apart of the ground and divided it to a more manageable size and then planted it." M.S. 10/4/16

"This morning we pulled out the cleome. Before removing the thorny plant, cut off the dried pods for next year." A.G. 9/13/16

The Fall 2016 qualitative results examples were selected from essays written by students on self-selected topics throughout the semester. Key examples were selected as representative of one or more learning outcomes.

10. Means of Assessment:

The assessment project will be a daily (during class) series of observational essays related to the class content. This is an extension of my Research Based Professional Development (RBPDP) that focused on the multiple benefits of writing across the curriculum and regular observations of nature.

In Spring 2017 the Plant Science class was evaluated as originally planned.

- **Feedback from Dean:** Assessment plan seems to be very well thought out and appropriate for the academic program

SEMESTER 2: DEVELOPING ASSESSMENT TOOL (s) and TIMELINE

3A. Describe or attach assessment tool (s), including sources of data, timeline for data collection and how data will be analyzed.

In Spring 2017 the Plant Science class was evaluated as originally planned.

Spring 2017 Qualitative Results Examples:

"Today we finally finished up the Landscape at Scoskie Hall and we had a really nice ribbon cutting as an official opening. The Vice Presidents were there and the staff at the new building. They were truly happy that that once boring landscape is now beautiful." O.M. 5/9/17

"Today I noticed that the Kwanzan cherry blossoms have started to fall off the trees. All of the Kwanzan cherry trees that I have seen have either fully or partially lost all the pink petals and now only the leaves are left. Other flowering trees have also started to lose their blossoms." L.T. 5/9/17

In Spring 2017 qualitative results examples were selected from student essays targeted to one of several learning outcomes for their final essay.

Original Timeline: Data will be collected in each semester for one Horticulture class. As the class evaluated will change from semester to semester, specific guidelines will apply relative to the focus of the class. For example, in Semester 1 (Fall 2016), Plant Propagation was evaluated, with an emphasis on opportunities for propagating, observations of propagating, etc. In Semester 2 (Spring 2017), Plant Science is being evaluated, with a more general emphasis on any type of plant related observation. In Semester 3 (Fall 2017), Pests of Ornamental Plants will likely be evaluated, with an emphasis on observations of pests, diseases, abiotic problems of plants. In Semester 4 (Spring 2018), Plant Propagation will likely be evaluated again, with the same criteria as before. The data will be evaluated in the following semester. Results will be organized both quantitatively and qualitatively.

The primary assignment is to write about and illustrate (storyboard) a direct observation about plants that was made prior to each class. There are two variations on this, the first essay is to be an historical one including one or more other people, and the last essay is to summarize the development of their observational skills over the semester.

Grading criteria include a baseline for doing each assignment, with additional points based on demonstrating greater observational skill, more detailed description, and higher level perception.

Criteria	Exceeds Standard	Meets Standard	Nearly Meets Standard	Does Not Meet Standard
Observational skill	Shows deep knowledge & understanding	Relates learning to class material or some personal reflection	Some general knowledge or understanding	Minimal general knowledge or understanding evident
Detailed description, verbal or illustrative	Logical sequence of description and expansion on the experience	Presents more details, though not perfected	Organizes some details, may be missing illustration	Minimal or no description
Higher level perception	Abstract reasoning or potential research or business related ideas expressed	Average insight	Limited insight	Not applicable
Overview for course length	Substantial observational skills as noted above, either throughout the course, or by the end of the course	Some improvement as noted above	Limited improvement as noted above	No progression in observational skills

3B. Desired results faculty would like to see.

The results are directed to site analysis and inventory of plant and associated materials.

It is expected that 75% of students achieve a mastery level of 90% or higher. Also, 90% of students would score 70% or above.

Fall 2016, 15 students taking the Plant Propagation class scored an average of 91.3%, with a range of 70-110%; 80% of the students scored 90% or higher.

Spring 2017, 10 students taking the Plant Science class scored an average of 90%, with a range of 80-101%; 50% of the students scored 90% or higher.

In collecting the data it was observed that there appears to be a strong relationship between final grades and DOE assignment grades, students scored an average of 95% on their semester DOE essays, with a range of 82-109%. There is not a complete correlation, sometimes students did better on final grades than on DOE grades, sometimes the reverse.

- **Feedback from CIE:**
- Linda, you have identified a PLO for this assessment project and developed a general rubric, which assists in the assessment of observational skills, perception, the students' ability to include details, etc. In order to better align the rubric with the targeted PLO and bring more attention to the

content of the observational essays, I recommend specific language that reflects the PLOs you identified in the first semester. For example, instead of, "Uses abstract reasoning...", include the content of the PLO In the rubric, "Uses abstract reasoning to describe how to conduct a site analysis and family inventory analysis for a residential landscape site." In other words, include the content you are assessing within the grading criteria.

- The desired results you describe will be yield useful data for assessing if the PLO has been mastered by a substantial amount of students.
- Additionally, your preliminary findings described in the last paragraph above, though interesting, do not relate to the targeted PLO, which should remain the focus of this project.

SEMESTER 3: COLLECTING AND ANALYZING DATA

7. **Summary of Results (attach aggregated data table, survey tool, etc., to support the summary)**

8. **Recommendations for Improvement:**

Feedback from Dean: This assessment seems to be progressing along on schedule, please to be sure to incorporate the feedback from CIE above in next stage of the project

SEMESTER 4: CLOSING THE LOOP AND SHARING KNOWLEDGE

9. **Use of Results:**

- **Feedback from CIE:**