February 16, 2015

Texas Tech University
Graduate Program Review
2014-15 Review Cycle
Interdisciplinary Studies

External Review Report

Programs included in the review report:
✓ Wind Science Engineering,
✓ Biotechnology,
✓ Museum Science and Heritage Management, and
✓ Arid Land Studies.

Basis of the review report:
✓ Self-study reports prepared by the four programs,
✓ Overview provided by the Graduate School administration during the site visit on February 11, 2015,
✓ Visits of the program facilities, and
✓ Meetings and interviews of the program leaders, program faculty, and students.

Strengths, Weaknesses, and Recommendations Across all Programs Reviewed

Strengths across all programs reviewed:
✓ Student and faculty enthusiasm about the INDS programs.
✓ Recognizing credits for courses taken at institutions other than Texas Tech.
✓ The final graduation options, thesis or portfolio, are well received by the students.
✓ Students are generally supportive of online classes, however, not entirely, e.g., discussion sections are expected to be offered on personal basis.
✓ Career Center is a good resource for finding jobs.

Weaknesses across all programs reviewed:
✓ Uncertainty about university’s commitment to the programs.
✓ Concerns over availability of funding.
✓ Timing of scholarship/fellowship deadlines and student admission deadlines is not well synchronized.
✓ Some websites contain out of date information, e.g., course offerings.
✓ Study plans are not given enough attention by academic advisors.
✓ Turnover among advisors is an issue for some students.
✓ Departments are not paying enough attention to the INDS students.
✓ Parking space is a problem for some students as they have difficulty getting to classes scheduled across different buildings.

Overall recommendations:
✓ Decupling administrative structure of programs, centers, institutes from their presentation (marketing) at the websites could be advantageous to all programs.
✓ Improvements of marketing of all INDS programs is needed.
✓ Addressing the weaknesses identified across all programs could be considered.

Strengths, Weaknesses, Recommendations and Rankings of Specific Programs

Wind Science Engineering Program

Overall Ranking: Very Good

Program Strengths:
✓ Availability of laboratories and equipment.
✓ Enthusiastic faculty and staff.
✓ The internship program.
✓ Classes from various departments.

Program Weaknesses:
✓ Lack of orientation session and a program seminar.
✓ Student-Center communication needs improvement.
✓ Students appear to be lacking information about faculty research.
✓ In some case the interests of home department of the Center faculty are not well aligned with the interests of the Center.

Recommendations:
Recommendation 1: Productivity the center-contributing faculty should be properly reflected in the Center statistics.
Recommendation 2: Organize an orientation session for new students, call meetings of all program students on a periodic basis (e.g., once per semester), require attending a graduate seminar.
Recommendation 3: Offering a program with about 15 PhD students could be difficult to sustain. Broadening the Program or aligning it with other similar programs could be considered. For example, creating an umbrella sustainable energy program could be undertaken. Expanding research directions to areas with a higher funding potential would benefit the Program.
Recommendation 4: Expanding modes and scope of undergraduate programs, professional graduate programs, certificate programs, and courses to meet the emerging industrial needs is a good idea (Note: The Center has established some of these programs). The tuition received may allow growing funds to support research. In essence both, the number of undergraduate students (or credit hours) and graduate students may increase.
Biotechnology Program

Overall Ranking: Very Good

Program Strengths:
✓ Availability of the state-of-the-art lab technology.
✓ Offering hands-on training.
✓ Curriculum is periodically updated with contemporary topics.
✓ The center is trying to forge interactions with the alumni.
✓ Students have difficulties interacting with the health sciences campus, e.g., getting into the classes needed, arranging course approvals, and issues as benign as getting badges.

Program Weaknesses:
✓ Biotechnology is not well represented at the job fair which limits internship opportunities.
✓ Teaching laboratories need more attention as some of the instruments may not always work, especially when the equipment is serviced by students.

Recommendations:
Recommendation 1: Some classes, e.g., ethics, communication could be scheduled in the second year, rather than in the first year. This would make the course load of the first year more acceptable to the students.
Recommendation 2: Periodically revise the web course postings for accuracy.
Recommendation 3: Streamline the course approval process so that the students enrolled in the Biotechnology Program do not waste time securing enrollment in courses, especially that each student takes classes across multiple programs.
Recommendation 4: The Program is technology and cost intensive. To offset the technology and training cost per student, two options may be considered. One would be to expand the scope of the Program. Besides expansion of doctoral areas, Master level programs, and offering specialized undergraduate courses could be considered. The PhD students interested in academic/training careers could teach some of the classes. It appears that offering a new program in bioinformatics is considered as the Program faculty. The second option would be to attract more externally funded research projects. These in turn would increase the utilization rate of the equipment and engage a larger number of students in sponsored research.

Museum Science and Heritage Management Programs

Overall Ranking: Very Good

Program Strengths:
✓ School in a museum is a unique feature of the Program.
✓ Hands-on knowledge and solving real-life problems is beneficial to the students.
✓ Faculty are passionate about the Program. The affiliation with the Graduate School is well received.
✓ Dedicated and enthusiastic students.
Program Weaknesses:
- Finding an external faculty to serve on an exam committee could be a challenge.
- Appointing students on hourly basis does not offer them tuition and other benefits. In addition, the museum hourly pay rate is low.

Recommendations:
Recommendation 1: Computational technology needs improvements, e.g., tools for exhibit design, could be taught.
Recommendation 2: At this time the depth of the curriculum is handled through the internships. Getting more in-depth coverage of various topical areas would be desired. More developments in a physical dimension would benefit the Program.
Recommendation 3: A better support for internship opportunities is needed. Improved networking with Texas Tech alumni would be beneficial.
Recommendation 4: Creating opportunities for students to get higher pay from more diverse sources of funding is needed. Students may need to take more than job.
Recommendation 6: The Heritage Management Program need more external visibility to attract better students.
Recommendation 7: Enabling adjunct faculty to apply for university grants would benefit both Programs.

Arid Land Studies Program

Overall Ranking: Good

Program Strength:
- The demand for graduates exists.

Program Weakness:
- Four students are enrolled in the Program at this time.

Recommendation:
Due to the low enrolment m, preserving the Program at a low administrative cost (or essentially none) could be most preferred option. For example, the Program could be administratively housed among one of the sustainability units.

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Mechanical and Industrial Engineering Dept
The University of Iowa
Graduate Program Review
Texas Tech University

Program Reviewed: Museum Science

Onsite Review Dates: February 11, 2015

Name of Reviewers
Internal:
Please include name, title, and Department

External:
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I. Academic Unit Description and Strategic Plan
Please evaluate the following by marking an X in one of the blanks for each item:

Vision, Mission and Goals
___X_ Excellent   ___ Very Good   ___ Good   ___ Needs Improvement

Strategic Plan
___X_ Excellent   ___ Very Good   ___ Good   ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.
The strategic plan is well developed.

II. Program Curriculum
Please evaluate the following:

Alignment of program with stated program and institutional goals and purposes
The adjunct faculty are not eligible to apply for university and other grants which is detrimental to the program.
IV. Students and Graduates

Please evaluate the following by marking an X in one of the blanks for each item:

**Time to degree**

_x_ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Retention**

_x_ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Graduate rates**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Enrollment**

___ Excellent  _x_ Very Good  ___ Good  ___ Needs Improvement

**Demographics**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Number of degrees conferred annually**

___ Excellent  _x_ Very Good  ___ Good  ___ Needs Improvement

**Support Services**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Job Placement**

___ Excellent  _x_ Very Good  ___ Good  ___ Needs Improvement

**Student/ Faculty Ratio**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement

V. Facilities and Resources

Please evaluate the following by marking an X in one of the blanks for each item:

**Facilities**

_x_ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Facility Support Resources**
_x_ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Financial Resources
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Staff Resources
___ Excellent     _x__ Very Good     ___ Good     ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement

VI. Overall Ranking

Very Good

Please provide summative conclusions based on the overall review.

The Museum Science and Heritage Management Programs are housed in the museum. The programs is run by 2.5 tenure track faculty and 6 adjunct faculty. The Program enrolls 45-50 graduate students. The students follow two options, the internship option (about 2/3 students) and the thesis option (1/3). The placement rate is 90%-95% in six months after graduation. The first job after graduation is usually at a small museum.

Opportunity:
✓ Market for more graduates exists.
✓ Reconsider the requirement of funded internships. In some cases this requirement may restrict student opportunities.

Strengths:
✓ School in a museum is a unique feature of the Program.
✓ Hands-on knowledge and solving real-life problems is beneficial to the students.
✓ Faculty are passionate about the Program. The affiliation with the Graduate School is well received.
✓ Dedicated and enthusiastic students.

Weaknesses:
✓ Finding an external faculty to serve on an exam committee could be a challenge.
✓ Appointing students on hourly basis does not offer them tuition and other benefits. In addition, the museum hourly pay rate is low.

Please provide summative recommendations based on the overall review.

Observations and Recommendations:
Observation 1: Coverage of technology in courses.
Recommendation 1: Computational technology needs improvements, e.g., tools for exhibit design could be taught.

Observation 2: Curriculum needs expansion.
Recommendation 2: At this time the depth of the curriculum is handled through the internships. Getting more in-depth coverage of various topical areas is desired. More developments in a physical dimension would benefit the Program.

Observation 3: Scope and quality of internship opportunities.
Recommendation 3: A better support for internship opportunities is needed. Improved networking with Texas Tech alumni would be beneficial.

Observation 4: Financial support for students.
Recommendation 4: Creating opportunities for students to get higher pay from more diverse sources of funding is needed. Students may need to take more than job.

Observation 5: Program visibility.
Recommendation 6: The Heritage Management Program needs more external visibility to attract better students.

Observation 7: Funding opportunities for adjunct faculty.
Recommendation 7: Enabling adjunct faculty to apply for university grants would benefit both Programs.
Graduate Program Review
Texas Tech University

Program Reviewed: Wind Science Engineering

Onsite Review Dates: February 11, 2015

Name of Reviewers

Internal:
Please include name, title, and Department

External:
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I. Academic Unit Description and Strategic Plan

Please evaluate the following by marking an X in one of the blanks for each item:

Vision, Mission and Goals
___ Excellent ___x_ Very Good ___ Good ___ Needs Improvement

Strategic Plan
___ Excellent ___x_ Very Good ___ Good ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.
The National Wind Institute strategic plan is comprehensive. Its objectives and strategies are well articulated. The need and feasibility of some objectives could be questionable.

II. Program Curriculum

Please evaluate the following:

Alignment of program with stated program and institutional goals and purposes
Please evaluate the following by marking an X in one of the blanks for each item:

Given the faculty resources assigned to graduate teaching, this program criterion is met. Appendix D of the Self-study lists five courses dedicated to the Program. The courses may not provide sufficient breadth of the topical coverage.

III. Faculty Productivity

Please evaluate the following by marking an X in one of the blanks for each item:

Qualifications
___ Excellent  ____ Very Good  ___ Good  ___ Needs Improvement

Publications
___ Excellent  ____ Very Good  ___ Good  ___ Needs Improvement

Teaching Load
___ Excellent  ____ Very Good  ___ Good  ___ Needs Improvement

External Grants
___ Excellent  ____ Very Good  ___ Good  ___ Needs Improvement

Teaching Evaluations
___ Excellent  ____ Very Good  ___ Good  ___ Needs Improvement

Professional Service
___ Excellent  ____ Very Good  ___ Good  ___ Needs Improvement

Community Service
___ Excellent  ____ Very Good  ___ Good  ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.
Productivity of the faculty cannot be assessed accurately as the center affiliated faculty contribute to the center as well as their own departments.

IV. Students and Graduates

Please evaluate the following by marking an X in one of the blanks for each item:

- **Time to degree**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Retention**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Graduate rates**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Enrollment**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Demographics**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Number of degrees conferred annually**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Support Services**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Job Placement**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

- **Student/Faculty Ratio**
  - ___ Excellent
  - ___ Very Good
  - ___ Good
  - ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement:

Assessment of some categories is of not of high confidence as the student population is rather small. It is not clear how the time to the degree is calculated. If the statistic reflected the time after the MS degree, then an effort should be made to reduce it. Experimental research is usually more time consuming than the theoretical research. The enrollment in the Program is rather steady and relatively low. However, it reflects the level of faculty resources directly assigned to the Program.

Offering internships to graduate students is a good idea as long as it enhances the research mission of the Program.
V. Facilities and Resources

Please evaluate the following by marking an X in one of the blanks for each item:

**Facilities**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Facility Support Resources**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Financial Resources**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

**Staff Resources**

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement

The research facilities are unique and of great value to the program.

VI. Overall Ranking  Very Good

Please provide summative conclusions based on the overall review.

The Center was established to research energy hazards. The NSF IGERT received by the Center has led to the development of the PhD Program. The Center operates unique laboratories equipped in specialized equipment such as the StickNet Instrumentation Platform, mobile doppler radars, debris impact cannon, wind tunnels, a tornado simulator, and a met tower. In addition, the West Texas Mesonet Network, wind-water desalination project, and WERFL building (to research impact of wind on structures) are available. The PhD Program enrolls usually 13 - 15 PhD students. The recently developed graduate certificate program enrolls 20 - 30 students, including online students. The PhD has existed for about 7 years. Most of its graduates have joined industry and some have become faculty. The PhD enrollment depends on funding. The establishment of an undergraduate program has created two TA lines.

**Program Strengths**

- Availability of laboratories and equipment.
- Enthusiastic faculty and staff.
- The internship program.
- Classes from various departments.

**Program Weaknesses**

- Lack of an orientation session and a program seminar.
- Student-Center communication needs improvement.
- Students appear to be lacking information about faculty research areas.
- In some cases the interests of home departments of the Center faculty are not well aligned with the interests of the Center.
Please provide summative recommendations based on the overall review.

Observations and Recommendations:

Observation 1: The number of faculty associated with the Center is large, however, the cumulative deliverables (research funding, publications, number of students) attributed to the Center do not scale well. This may have to do either with uneven productivity of the faculty or the formula used to allocate faculty output to the Center.

Recommendation 1: Productivity the center-contributing faculty should be properly reflected in the Center statistics.

Observation 2: Some students feel isolated in the Program.

Recommendation 2: Organize an orientation session for new students, call meetings of all Program students on a periodic basis (e.g., once per semester), require attending a graduate seminar.

Observation 3: Revisit the Program scope and its relationship to other programs.

Recommendation 3: Offering a program with about 15 PhD students could be difficult to sustain. Broadening the Program or aligning it with other similar programs could be considered. For example, creating an umbrella sustainable energy program could be implemented. Expanding research directions to areas with a higher funding potential would benefit the Program.

Observation 4: The curriculum of the PhD Program is versatile. It draws from courses offered across different departments. The students in the PhD Program are largely supported by the center faculty.

Recommendation 4: Expanding modes and scope of undergraduate programs, professional graduate programs, certificate programs, and courses to meet the emerging industrial needs is a good idea (Note: The Center has established some of these programs). The tuition received may allow growing funds to support research. In essence both, the number of undergraduate students (or credit hours) and graduate students could increase.
Graduate Program Review
Texas Tech University

Program Reviewed: Arid Land Studies

Onsite Review Dates: February 11, 2015

Name of Reviewers
Internal:  
Please include name, title, and Department

External:  
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I. Academic Unit Description and Strategic Plan
Please evaluate the following by marking an X in one of the blanks for each item:

Vision, Mission and Goals  
___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

Strategic Plan  
___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.

II. Program Curriculum
Please evaluate the following:

Alignment of program with stated program and institutional goals and purposes  
___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement
Curriculum development coordination and delivery
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Program learning outcomes assessment
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Program curriculum compared to peer programs
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Please evaluate the following by marking an X in one of the blanks for each item:

III. Faculty Productivity
Please evaluate the following by marking an X in one of the blanks for each item:

Qualifications
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Publications
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Teaching Load
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

External Grants
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Teaching Evaluations
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Professional Service
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Community Service
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.
IV. Students and Graduates

Please evaluate the following by marking an X in one of the blanks for each item:

**Time to degree**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Retention**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Graduate rates**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Enrollment**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Demographics**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Number of degrees conferred annually**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Support Services**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Job Placement**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Student/ Faculty Ratio**
___ Excellent ___ Very Good ___ Good ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement

V. Facilities and Resources

Please evaluate the following by marking an X in one of the blanks for each item:

**Facilities**
___x_ Excellent ___ Very Good ___ Good ___ Needs Improvement

**Facility Support Resources**
___x_ Excellent ___ Very Good ___ Good ___ Needs Improvement
Financial Resources
___ Excellent  _x__ Very Good  ___ Good  ___ Needs Improvement

Staff Resources
_x__ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.

VI. Overall Ranking

Good

Please provide summative conclusions based on the overall review.

The Master of Science in Arid Land Studies is an interdisciplinary graduate program designed intended for students interested in expanding their knowledge rather than specialize in a specific area. Students in the Program design a unique program to suit their individual career goals.

Program Strength:
✓ The demand for graduates exists.

Program Weakness:
✓ Four students are enrolled in the Program at this time.

Please provide summative recommendations based on the overall review.

Observation: The size of the program largely depends on the grant support.

Recommendation: Due to low enrolment, preserving the Program at a low administrative cost (or essentially none) could be most preferred option. For example, the Program could be administratively housed among one of the sustainability units.
Graduate Program Review
Texas Tech University

Program Reviewed: Biotechnology

Onsite Review Dates: February 11, 2015

Name of Reviewers

Internal:
Please include name, title, and Department

External:
Please include name, title, and Department
Andrew Kusiak
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I. Academic Unit Description and Strategic Plan
Please evaluate the following by marking an X in one of the blanks for each item:

Vision, Mission and Goals
___X__ Excellent   ___ Very Good   ___ Good   ___ Needs Improvement

Strategic Plan
___ Excellent   _X__ Very Good   ___ Good   ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.
The Program offers modern and growing opportunities.

II. Program Curriculum
Please evaluate the following:

Alignment of program with stated program and institutional goals and purposes
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Curriculum development coordination and delivery
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Program learning outcomes assessment
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Program curriculum compared to peer programs
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Please evaluate the following by marking an X in one of the blanks for each item:

The program fits well the institutional goals.

III. Faculty Productivity

Please evaluate the following by marking an X in one of the blanks for each item:

Qualifications
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Publications
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Teaching Load
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

External Grants
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Teaching Evaluations
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Professional Service
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Community Service
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement.

The Program faculty is very dedicated.
IV. Students and Graduates

*Please evaluate the following by marking an X in one of the blanks for each item:*

*Time to degree*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Retention*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Graduate rates*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Enrollment*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Demographics*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Number of degrees conferred annually*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Support Services*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Job Placement*

___ Excellent  ___x_ Very Good  ___ Good  ___ Needs Improvement

*Student/ Faculty Ratio*

___ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement

*Please comment on the positive components and suggested areas of improvement*

The students enjoy the education and internship opportunities provided by the Program.

V. Facilities and Resources

*Please evaluate the following by marking an X in one of the blanks for each item:*

*Facilities*

___x_ Excellent  ___ Very Good  ___ Good  ___ Needs Improvement
Facility Support Resources
___ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Financial Resources
___ Excellent     _x_ Very Good     ___ Good     ___ Needs Improvement

Staff Resources
_ _x_ Excellent     ___ Very Good     ___ Good     ___ Needs Improvement

Please comment on the positive components and suggested areas of improvement

The lab facilities are modern.

VI. Overall Ranking

Very Good

Please provide summative conclusions based on the overall review.

The Biotechnology Program emerged out of a core facility over a decade ago. The Program emphasizes hands-on experience. Most of students (about 80%) follow the internship (non-thesis) option. The lab infrastructure is modern.

Program Challenges:
✓ Running labs is time consuming.
✓ Arranging internships to essentially all students is time consuming.

Program Strengths:
✓ Availability of the state-of-the-art lab technology.
✓ Offering hands-on training.
✓ Curriculum is periodically updated with contemporary topics.
✓ The Center is trying to forge interactions with the alumni.
✓ Students have difficulties interacting with the health sciences campus, e.g., getting into the classes needed, arranging course approvals, and issues as benign as getting badges.

Program Weaknesses:
✓ Biotechnology is not well represented at the job fair which limits internship opportunities.
✓ Teaching laboratories need more attention as some of the instruments may not always work, especially when the equipment is serviced by students.

Please provide summative recommendations based on the overall review.
Observations and Recommendations:

Observation 1: The curriculum is not well balanced across the first and second year of the Program. 
Recommendation 1: Some classes, e.g., ethics, communication could be scheduled in the second year, rather than in the first year. This would make the course load of the first year more acceptable to the students.

Observation 2: University/ Program catalog is not current. 
Recommendation 2: Periodically revise the web course postings for accuracy.

Observation 3: Course approval procedure are cumbersome. 
Recommendation 3: Streamline the course approval process so that the students enrolled in the Biotechnology Program do not waste time securing enrollment in courses, especially that each student takes classes across multiple programs.

Observation 4: Long-term viability of the Program. 
Recommendation 4: The Program is technology and cost intensive. To offset the technology and training cost per student, two options may be considered. One would be to expand the scope of the Program. Besides expansion of doctoral areas, Master level programs, and offering specialized undergraduate courses could be considered. The PhD students interested in academic/training careers could teach some of the classes. It appears that offering a new program in bioinformatics is considered as the Program faculty. The second option would be to attract more externally funded research projects. These in turn would increase the utilization rate of the equipment and engage a larger number of students in sponsored research.