

## **UD Support of Core Facilities: A Recommendation from the UD Core Facility Task Force**

### **INTRODUCTION**

The University of Delaware recognizes that institutional investment in faculty-led core facilities, responsive to their user bases, is critical to the research and teaching missions of the University. Core facilities are those that provide shared access to resources that are too expensive or complicated for individual investigators to acquire and/or maintain. Core facilities are increasingly essential as research becomes more interdisciplinary and reliant on expensive instrumentation. In 2011, the Vice Provost for Research established a core facility task force to study capabilities, needs, financing, administration, and compliance on the topic of core facilities at UD. The group (see Appendices A and B for participants) met regularly starting in the 2010-2011 and 2011-2012 AY and produced two formal reports describing their findings. The first report (Appendix A) includes a definition of a core facility, a list of existing cores at UD, and a study of best practices from other academic institutions. It helped establish a survey of a subset of UD faculty that potentially use cores. The second report (Appendix B) updates the definition of a core facility and identifies important characteristics of a successful core facility as well as desirable features of a core facility at UD. Here, we propose principles and implementation mechanisms for supporting such facilities.

Institutions that organize and invest in core facilities realize financial benefits as well as academic benefits. For example, cost savings are achieved and efficiency gained when faculty share access to expensive instrumentation rather than duplicate technologies across campus. Faculty recruitment and retention are improved by providing access to state of the art instrumentation, and our students benefit both in their training and research capabilities. One challenge presented with core facility administration is compliance with very complicated and evolving Federal regulations. An organized approach to management of core facilities enables a better understanding of relevant federal guidelines and improves compliance. Further, excellence in certain technology platforms can lead to an improved academic reputation in the relevant field, even without investment in new faculty hires. Thus, although many core facilities cannot practically achieve 100% cost recovery through direct user fees alone, ongoing institutional support of core facilities is a worthwhile investment in the University mission.

This document describes a framework of support for core facilities that are managed, organized, and maintained by units around campus - "distributed core facilities". That is, core facilities where the fiscal and administrative management is by faculty, centers/institutes, departments, or colleges. It also describes a plan to create an infrastructure to support world-class core facilities that serve a broad cross-section of the University community. These facilities would be "centrally-organized core facilities" meaning that fiscal support and administrative management would be at the level of the Provost, VPR, or a University-wide academic unit. Because of the broad range of possible core facilities, technologies, technical staff, and research interests, we highlight that both "distributed" and "central" core facilities should be nurtured at UD. The objective is not to push central organization of all core facilities, but to create a mechanism and pool of resources to allow for central organization of cores in cases where faculty deem it appropriate.

### **RESOURCES FOR ALL UD CORE FACILITIES**

"Distributed" and "central" core facilities must comply with all relevant federal guidelines (e.g., OMB circular A-21) when charging federal grants and contracts and may have needs in terms of basic infrastructure to support faculty research. Thus, all such facilities should be eligible to receive:

- (1) guidance in the determination and establishment of user fees;
- (2) access to available information technology platforms to facilitate billing, accounting, and data management; and
- (3) opportunities to compete for capitalization funds from external sources (e.g., NSF Major Research Instrumentation program slots).

## **A NEW PROGRAM TO SUPPORT CENTRAL CORE FACILITIES**

Some core facilities serve a very broad cross-section of the University community. One example is the Bioimaging Facility that has faculty clients from nearly all colleges. Cores with a broad user community may be best organized under either a "distributed" or "central" model. To determine which core facilities are priorities for central support, several factors should be considered. Central cores should:

- (1) have broad impact on the research, education, and outreach missions of UD and our partner institutions;
- (2) provide services in a fair and transparent way to any PI, department, or unit;
- (3) rely on faculty input for scientific and strategic direction;
- (4) be fully compliant with all appropriate accounting guidelines (where pricing is set in a way that considers, but does not necessarily charge, the true cost of the service);
- (5) have a reasonable expectation regarding cost recovery or can justify facility costs by the breadth of impact on research and education; and
- (6) have a sunset and/or recapitalization plan.

We propose that a process be created that will allow existing or new core facilities to be considered for five years (renewable) of central support, with central support providing:

- (1) funds to cover operational deficits for the financial costs of technical staff, service contracts, operating supplies, etc. based on a five-year budget model and business plan;
- (2) support for hiring and HR liaison functions;
- (3) administrative support for logistical and organizational activities; and
- (4) administrative support for budgeting, invoicing, establishment of fees, projections, reconciliation, etc.

In exchange for central support, each central core facility should agree to:

- (1) have a faculty advisory committee (with a UD faculty chair) that meets regularly;
- (2) demonstrate intellectual impact and visibility commensurate with its level of institutional support;
- (3) conduct annual evaluation of fee structures and benchmarking against similar cores at other universities as part of a business plan;
- (4) provide quarterly financial and user-base updates;
- (5) undergo three- and five-year reviews by a committee knowledgeable in the technology; and
- (6) have recapitalization and/or sunset plans in place for each five-year period of operation.

## **PROPOSED PROCESS**

Periodically, the Vice Provost for Research or other appropriate administrator can issue a call for proposals that invites faculty to propose new or existing core facilities for central support. Each proposal should include a description of the relevance, importance, context, and impact of the proposed facility as well as a budget, faculty advisory committee membership list, and sunset plan. The applications should be considered by a group of relevant, well-respected faculty leaders that can prioritize the importance of proposed facilities. Facilities can then be implemented based on available resources, and the chair of the faculty advisory committee for the proposed core facility can sign a memorandum of understanding describing obligations listed above before the facility receives institutional support.

## Members of the Core Facility Task Force Submitting this Recommendation

Name	Unit
Mark Barteau	Senior Vice Provost for Research and Strategic Initiatives
Kelvin Lee, Chair	Director Delaware Biotechnology Institute
Stuart Binder-Macleod	Physical Therapy
Jeff Caplan	Associate Director Bioimaging Core <sup>†</sup>
Chris Cook	Chief Business Officer, College of Engineering
Kirk Czymmek	Biological Sciences, Director Bioimaging Core, CTCR Core*
Doug Doren	Associate Dean, Arts and Sciences
Matt Doty	Materials Science and Engineering
Melinda Duncan	Biological Sciences
Chris Hudson	Office of the Executive Vice President
Kenneth Kirschner	College of Health Sciences
George Luther III	School of Marine Science and Policy
Mike Matthews	Budget Office
Blake Meyers	Plant and Soil Sciences
Greg Miller	Psychology
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Kristi Kiick	Deputy Dean, College of Engineering
Tatyana Polenova	Chemistry and Biochemistry
Dick Sacher	Assoc. Director, Research Support, IT-Client Support & Services
Carl Schmidt	Animal and Food Sciences
Mark Stanton	Psychology
Karl Steiner	Sr. Assoc. Provost, Research Office
John Xiao	Physics
Other participants:	
Allie Sethman	Delaware Biotechnology Institute

<sup>†</sup>since Aug 2012

\*through July 2012

**First Report from the University of Delaware Task Force on Core Facilities**  
**3 June 2011**

At the start of 2011, Mark Barteau convened a task force of faculty and staff to take a comprehensive look at core facilities at UD - capabilities, needs, financing, administration, and compliance. For the purposes of this Task Force, the definition of a "Core Facility" refers to an entity that provides shared use access to technology platforms. Such facilities often provide a mechanism for individual faculty and students to access platform technologies that are too expensive for a single investigator. They may exist at any level within the University (consortia of faculty, department, College, etc.) and sometimes include technical staff, management staff, physical facilities, administrative support, and a fee structure.

The members of the Task Force are listed in Appendix 1 and include senior administrators, core facility directors, faculty, and staff at the University. The Task Force met in person on February 14, 2011 to discuss an action plan for the group. At that meeting, the task force discussed reasons for exploring core facility organization at UD, a brief background and history of core facility organization at other institutions, and discussed next steps. As a result of that meeting, the Task Force assembled four subgroups. Each subgroup was tasked with one of the following items: 1) define what a core facility is (Appendix 2), 2) explore how other academic institutions have organized their core facility administration (Appendix 3), 3) develop a list of core facilities at UD (Appendix 4), and 4) develop a draft list of survey questions that could be used to poll the community at large on the issue of core facilities (Appendix 5). The Task Force convened on May 25, 2011 to discuss and develop a report summarizing their findings.

The Task Force recommends that UD further study the issue of core facility organization at UD with an eye toward building a centrally organized infrastructure to administer, maintain, and continually update core facilities. Such an infrastructure should be flexible enough to allow various types of technologies to be included (from physical sciences to life sciences to computational sciences) and also not be forced onto faculty and units. Such an infrastructure should encourage growth and investment in state of the art instrumentation to support the research and educational missions of UD to help recruit and retain distinguished faculty as well as offer a mechanism to improve compliance with relevant federal circulars. Importantly, such an infrastructure, if developed, should be guided and informed by the experience of other institutions, yet developed in a way that addresses UD's unique characteristics and strengths.

Key findings from the Task Force:

- A) A definition of a Core Facility is suggested that describes in some detail the relative roles of personnel, infrastructure, and administration (see Appendix 2).
- B) The Task Force identified an initial list of 20 core facilities on campus (Appendix 4). These cores have a variety of financial models that include support from user fees, from grants, from UD, and from the state. The initial list is incomplete because it is difficult to find all such cores and no central portal to communicate the existence of core facilities is available.
- C) Many other institutions around the country have centralized the management and organization of some core facilities. Such a switch has been motivated by faculty who desire access to technologies, yet wish to be relieved of the burden of managing core facilities. Such a switch has also been motivated by administrations that wish to facilitate faculty recruiting and retention as well as improve compliance (increasing federal regulations as well as expectations from NSF and

NIH moving forward were often cited as reasons for reorganizing cores). Such a changeover is viewed as providing significant cost savings to the institution.

- D) Among institutions that have switched to a centrally organized group, a primary issue is Change Management among the PIs. Faculty/units organizing certain core facilities may feel a loss of control and technical staff may be uncomfortable with new arrangements. However, after the fact, it appears that most faculty realize they give up very little, gain a lot, and technical staff are removed from some of the politics associated with various units.
- E) Building an infrastructure to organize core facilities is best done with an influx of funds to "encourage the behaviors and culture" that are desired. Such investment includes support for administrative staff, subsidies in core facility operating expenses, and investment in capital equipment. Such an investment comes with the expectation of a detailed reporting structure.
- F) Very few of the core facilities studied are able to recover all of their operating expenses through user fees.
- G) Each institution interprets OMB A-21 guidelines differently and this can have an important impact on core facility organization, management, and success.
- H) Anecdotal evidence suggests that between 10% and 15% of NIH R01 dollars are spent in a core facility setting. [At UD in 2010, there were 66 NIH awards for \$35.7M including 37 R01s at \$14.4M].
- I) If UD determines it appropriate to continue studying this issue, an important next step will be to survey relevant faculty and students on their experiences using cores at UD, on their core facility needs moving forward, and on their expectations for support. A list of possible survey questions is provided in Appendix 5.

## APPENDIX 1

## UD Task Force on Core Facilities

Name, <sup>Subgroup</sup>	Unit
Mark Barteau	Senior Vice Provost for Research and Strategic Initiatives
Kelvin Lee, Chair <sup>2</sup>	Director Delaware Biotechnology Institute
Chris Cook <sup>1</sup>	Chief Business Officer, Engineering College
Kirk Czymmek <sup>3</sup>	Biological Sciences, Director Bioimaging Core, CTCR Core
Doug Doren <sup>2</sup>	Associate Dean, Arts and Sciences
Chris Hudson <sup>2</sup>	Office of the Executive Vice President
Kenneth Kirschner <sup>3</sup>	College of Health Sciences
George Luther III <sup>4</sup>	School of Marine Science and Policy
Blake Meyers <sup>4</sup>	Plant and Soil Sciences
Tunde Ogunnaiké <sup>3</sup>	Deputy Dean, Engineering College
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Carl Schmidt <sup>1</sup>	Animal and Food Sciences
Mark Stanton <sup>1</sup>	Psychology
Karl Steiner <sup>2</sup>	Sr. Assoc. Provost, Research Office
<i>Other participants:</i>	
Kawkab Rasheed	Office of the Executive Vice President
Allie Sethman	Delaware Biotechnology Institute
Melissa Harrington	ACE Fellow, Research Office

<sup>1</sup>Subgroup on "What is a Core Facility Comprised Of?"

<sup>2</sup>Subgroup on "Study Other Institutions"

<sup>3</sup>Subgroup on "What is Available at UD Now?"

<sup>4</sup>Subgroup on "What are the Needs at UD / Survey?"

## APPENDIX 2

**What is a core facility? Core facilities typically:**

- Provide shared access to state of the art technologies that are typically too expensive to warrant purchase by individual investigators.
- Provide appropriate infrastructure (software, computational support) to render data into product useful to clients.
- They may be formed by faculty working as a small consortium, may exist at a Department-level, College-level, or may support faculty and students Institution-wide.

**Core Technical Personnel:**

- Are experts in the application of the appropriate core technologies.
- Train clients in the use of facility resources.
- Consult and collaborate with investigators to design optimal strategies for using the core resources.
- Remain knowledgeable of technology developments and recommend adoption of new approaches and instruments as they become available.

**Physical Plant:** Many core facilities occupy space dedicated to the facility although some are housed within spaced devoted to other activities (such as professors' laboratories). The amount of dedicated space is sufficient to house the equipment and reagents necessary to execute the core facilities mission and to carry out the experimental procedures associated with that mission. Many core facilities have special needs such as high throughput computer lines, high performance computers, appropriate ventilation and disposal systems (biohazards, ozone) which may require an interface with Environmental Health and Safety. Appropriate office space and/or desks are present to serve staff needs.

**Core Director:** Many core facilities have a Ph.D. level director that is responsible for the activities of one or more cores. In some cases, the director is responsible for strategic oversight, interaction with senior administration (chairs, deans, provost), proposal writing to support the core activities along with collaborating or consulting on proposals written by core clients. The director may be responsible for the core facilities budget along with determining core fee structure on a yearly basis and communicating this structure to clients and senior administrators. The director may or may not be a faculty member. Many effective core facilities have leadership from faculty either through a Director role or through an advisory committee.

**Core Facility Staff:**

Facilities requiring more than one technician may have staff with different levels of responsibility. For example, a manager may have a Master's degree and be responsible for the day-to-day activities of the core including supervising technicians, running experiments, consulting with users on sample preparation and experimental technique, training users in use of the core's technologies and monitoring core facility usage. In addition, the manager may interact with non-core groups that are required for core activities (administrative support, IT, building maintenance, suppliers, etc.) and ensures that maintenance contracts are initiated or renewed on all instruments.

A core may employ junior staff that report to the core director. These individuals can perform a variety of technical duties including reagent preparation, execution of experiments, supervising clients

that are using core resources, equipment maintenance (when not performed by suppliers), daily and weekly inventory of supplies along with chemical hygiene and biosafety.

**Administrative Support:** Core facilities require administrative support for billing, tracking expenses and evaluating fee structures, and maintaining compliance with federal and state laws. Billing and expense tracking are typically done by administrative assistants that are either a part of the core facility administration or affiliated with a department or college. Overall financial aspects (fee structure, compliance) are evaluated by interaction between the core supervisor, director and university administration (Office of Research Compliance). Assessment of core facility impact is an additional component that is important.

**Clients:** Core facility users are typically grouped in two categories: internal and external clients. Internal clients are those affiliated either with the host institution or with affiliated institutions (e.g. Christiana Hospital). External clients are those not associated with the core facility host institution or its affiliates. This distinction is typically used to establish different fee structures for internal and external clients. In many cases internal users are offered a subsidized fee structure while external users are billed for all expenses associated with using the core facility.

**Faculty:** Core facilities may also have faculty serving as advisors to the core. These individuals are frequently heavy users, are familiar with the technology and can provide valuable feedback regarding core products. In addition, these faculty may work with the Core Director to prepare proposals (as Co-PIs) and to champion the core's role in the institution.

**Fees:** Fee structure must be in compliance with appropriate federal and state laws and funding agency requirements. Fees are determined based on reagent costs, equipment costs (maintenance fees, equipment depreciation, computer cycles, etc.), and core personnel time. As mentioned under Clients (see above) there may be different fee structures for internal and external users. The fee structure must be transparent to clients.

**Core Personnel Performance Evaluations:** Core personnel responsibilities are sometimes difficult to translate to standard departmental performance evaluations, particularly at senior levels. Core directors may fall outside standard tenure track considerations. Core supervisors and technicians also have responsibilities that preclude their ability to achieve promotion to the highest levels attainable by professionals not working in core facilities. It is essential that clearly defined, achievable goals be incorporated into performance evaluations for core personnel. Core personnel must have a path available to them to achieve promotion levels comparable to other professionals.

**Informatics:** A growing concern for some core facilities is informatics. Some of these concerns can be handled by the institution's IT department, including support of hardware and software dedicated to "housekeeping" issues such as scheduling, billing, training and text processing. Some cores have unique issues. For example, the DNA Sequencing Core will require access to large capabilities in both data warehousing and sharing. Such unique need may be difficult to handle solely within the institutions IT department(s). With growing reliance on techniques that produce large datasets (>1TB per experiment), IT and laboratory information management systems (LIMS) are critical considerations for a core facility and core facility infrastructure.

## APPENDIX 3

**KEY SUMMARY POINTS BASED ON CONVERSATIONS WITH OTHERS**

(UC San Francisco, University of Chicago, Jackson Laboratories,  
Cornell University and information from national surveys):

A switch to a centrally organized group of core facilities is motivated by faculty who desire access to important instruments, who wish to be relieved of the burden of managing core facilities themselves. It is also motivated by an administration that wishes to facilitate faculty recruiting and retention as well as improve compliance. Such a process is often viewed as being cost effective to the University.

Change from a distributed system to a centrally organized group brings with it important issues around Change Management. Faculty/units organizing certain core facilities may feel a loss of control and technical staff may be uncomfortable with new arrangements. However, after the fact, it appears that most faculty realize they give up very little, gain a lot, and technical staff are removed from some of the politics associated with various units.

It is important to define what a core facility is. The decision about which cores are included in a central organization may be based on having a broad user base. Other factors may include sources of funding, the technology itself, as well as considerations about the importance to the institution of the faculty that would be the primary beneficiaries. Defining what a core is and then having an open process to centralize cores (without forcing it) is an important part of the Change Management issue.

It is important to figure out what behaviors you want and the how to create that culture. A "large influx" of funds helped start that at Univ Chicago and Cornell. Jackson Labs benefits from a large revenue stream related to mouse production. All centrally organized cores studied receive significant investment from the central administration in both administrative staff support (nominally, an administrative director, an HR person, a financial person, and possibly others) as well in operating subsidies. These subsidies are 10% - 35% of the operating budget of the cores beyond the administrative support.

While the operating structure varies, a typical structure includes a Core Facility Director (not faculty), technical staff that report to the Core Director, and Faculty engagement through an Advisory Board.

Equipment purchases are a critical challenge. Possible sources of support include: institutional investment, NIH/NSF equipment grants, faculty generosity (start-up or everyone just chipping in), a portion of user fees tied to equipment depreciation.

Other Topics That Came Up Repeatedly:

10-15% of NIH R01 dollars are probably spent on core facility services.

Every institution interprets A-21 differently.

Most cores do not recover all of their costs through user fees.

It is important to have clearly defined plans for closing a core facility and/or moving it out of a central infrastructure.

New cores should be developed with a stronger sense of the role of IT issues.

Many cores include repair/maintenance costs in user fees.

Many include professional development activities in user fees.

Some do and some do not include protocol development activities in user fees.

**Appendix 4** contains confidential financial information about certain UD Core Facilities and is redacted from this document.

## APPENDIX 5

**Suggested Survey Questions on the UD Core Facilities (Questions need to be reworked into a format suitable for an electronic survey).**

1. Do you know what core facilities are available at UD and where they are located?
2. Do you use any core facilities at UD?
  - a. If so, how often do you use each of the core facilities?
3. For each facility that you use:
  - a. Are you satisfied with the service?
  - b. Are the user fees reasonable?
  - c. If not, which rates in particular and what is the basis for your dissatisfaction with them?
  - d. Are you familiar with how the user fees are determined?
4. Are any of the following aspects relevant to the core facility that you use and could be improved:
  - a. Sample tracking or other aspects of lab information management
  - b. Customer service
  - c. Data delivery; the data retention policy
  - d. The cost of long-term data maintenance
5. Are there any redundancies that diminish service, cost effectiveness or are confusing about the core facilities that you use?
6. Please describe the core facility services offered at UD that should:
  - a. Get smaller or be outsourced during the next 2 years?
  - b. Expand in new directions or via the addition of new (related or newer generation) equipment?
7. Should any (and if so, which) UD core facilities offer more services to facilitate your work?
8. What core facilities do you use that are not located at UD?
9. What core facilities should be available at UD that we do not have?
10. Do you prefer to use an outside vendor for some services available on campus?
11. Do you have equipment or are you aware of equipment on campus that is currently not part of a core facility but would be suitable for inclusion in core facility?
  - a. If so, what is it and where is it?

**Second Report from the University of Delaware Task Force on Core Facilities  
May 24, 2012 (updated with names July 2012)**

**Summary**

This second report of the Task Force on Core Facilities (committee members listed at end of this report) covers the period of September 2011 – May 2012. During this time, CFTF had multiple in-person meetings focused on i) surveying the faculty experiences with the Life Sciences Core Facilities at UD; ii) studying selected Core Facilities; iii) establishing salient characteristics of successful core facilities on campus; iv) beginning to discuss the implementation plans for the development of University-wide policies on Core Facilities. The outcome of this work is i) more comprehensive understanding of the current infrastructure on campus; ii) realization that the existing core facilities have diverse missions, necessitating diverse operating models; iii) refinement of the definition of a core facility. The CFTF will next consider a UD framework for guidelines and policies related to Core Facilities.

***Specific activities/findings***

Fall Semester: We launched a survey of selected Core Facilities at UD. The survey focused only on faculty experiences using Life Science Core Facilities (i.e. molecular/cellular life science) because these types of core facilities are common among institutions, PIs normally expect to pay a fee to access the core facility, and there is significant federal interest in and guidance related to such cores. The results of the survey are posted at: <http://www.dbi.udel.edu/coreFacilityTF/Report/>. We note that the mandate of the CFTF is broader than life science cores.

Spring Semester: We had nine in-person meetings. We began by discussing some of the key issues related to core facilities, including i) core facility mission; ii) user base; iii) physical and personnel infrastructure; iv) reporting structure; v) financial structure. We felt that we needed more faculty input into the process and expanded the group by adding four more members. We realized that there is a diversity of operating models amongst the current core facilities on campus, and to understand better the existing cores we studied several representative facilities. These facilities are: NMR facility (Department of Chemistry and Biochemistry, College of Arts and Sciences), Keck Imaging Facility (College of Engineering), and ResCore (Delaware Rehabilitation Institute and Department of Physical Therapy). These facilities were deemed to be very successful in serving the scientific-technological, educational and outreach missions of the University community. In the course of these studies and discussions, we learned that these successful facilities have different operational models, which are determined by the needs of their respective user constituencies. It became clear that any Institution-wide framework developed by CFTF will have to provide flexibility to accommodate diverse requirements of the current and future core facilities.

As a result of these conversations, we refined the definition of a core facility to be the following:

Core Facilities:

Provide shared access to resources (e.g. specialized expertise, state of the art technology, research populations, computational infrastructure, etc.) that are often too expensive or complicated to acquire and/or maintain by individual investigators.

They may be formed by faculty working as a small consortium, or may exist at a Department, Center, Institute, or College level, and/or may support faculty and students Institution-wide.

In addition, we identified a list of characteristics of successful core facilities at UD, as well as some desirable features of cores. These are provided in Appendix 1.

We have begun to discuss possible implementation plans and will continue to meet over the summer to develop a recommended framework for core facilities.

In these initial discussions we have identified some important challenges that any institution should address:

- financing and support of core facilities
- capitalization of core facilities
- support for core facility staff

**APPENDIX 1****Characteristics of a successful core facility at UD**Technology or service capabilities and resource allocation

Unique capabilities are provided in state-of-the-art technologies or services and/or skills.

Facility specialty (i.e. technology, skill, etc.) is commensurate with the needs of a broad user base (rather than a single PI).

Faculty leadership is centrally involved in defining the technologies or services and/or skills needed on campus.

Transparent access is provided to the core facility based on user needs and available resources.

Each core facility may have unique issues, staffing, technology, and other needs.

Importance to Advancing Research and Education at UD

Core facilities enable dissemination of scientific results through publications in peer reviewed journals, books, and other printed and electronic sources.

Core facilities often enhance the quality and competitiveness of applications for external funds.

User base

A critical mass of multiple faculty is involved, typically from multiple units across campus (rather than a single department).

User base includes faculty, technical staff, postdocs, graduate and/or undergraduate students

User base may include other academic and research institutions (partners, regional, national, international) and/or industry.

User base of faculty is actively engaged in research activities that rely on the core facility technology/services.

One measure of engagement is external funding for research activities.

Staffing

Successful cores have excellent technical staff available to interact with and train faculty, students, and external users. In many cases (as appropriate to the core) this may involve a Ph.D. level scientist with relevant expertise who manages day to day operations of the core (basic budgeting, equipment oversight, training and education, management of other staff, interactions with administrative staff, etc.)

Recruiting and retaining excellent core facility staff may require basic operating budget (1 book) or CNTT type positions to provide some measure of job security and continuity as well as opportunities for continued professional development.

The number of technical staff is commensurate with the size and scope of the core.

An infrastructure of administrative staff is available to support OMB A-21 compliance, billing, HR, etc.

A faculty committee provides strategic and technical guidance to the facility staff and vice-versa.

Facility staff may report to the unit that provides the greatest financial support for the facility, the unit that has the closest related technical expertise, or other unit. The optimal reporting structure for any given facility may be different from other facilities.

Finances

Fees should be established in a way that is compliant with OMB A-21 and that involves a calculation of the true cost of delivering the service. Fees should be set in the context of a comprehensive, realistic financial model for the facility. This principle is separate from whether or to what extent fees cover operating costs, replacement costs, amortized purchase costs, etc.

Nearly all core facilities should not be expected to fully recover operating expenses through user fees alone, so an institutional investment will be required to maintain most cores. The rationale for and sources of funding as well as the mechanism for periodic review of such arrangements will likely vary across core facilities and perhaps over time.

The user fee established for any given service should balance the need for having the facility at UD (versus elsewhere), efficient operation of the facility, a desire to recover as much of the operating expense as is reasonable, and realistic / market pricing.

New core facilities may require capital investment.

Other

An institutional process or framework could help identify appropriate core facilities for support in the face of limiting resources.

**Desirable Features of a core facility at UD:**

Core facilities that include ongoing informal education of PIs, students, and staff. In some instances it may be appropriate for core facility staff to directly participate in the formal educational mission of the University.

Core facilities should strive to make new knowledge and technologies available to the UD community including through protocol and technology development.

Core facility staff should offer help to PIs and students on experimental design and analysis.

## Appendix 2

### Members of the Core Facility Task Force AY2011-2012

Name	Unit
Mark Barteau	Senior Vice Provost for Research and Strategic Initiatives
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Matt Doty	Materials Science and Engineering
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Greg Miller	Psychology
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Kristi Kiick	Deputy Dean, Engineering College
Tatyana Polenova	Chemistry and Biochemistry
Dick Sacher	Assoc. Director, Rsch Data Mgt, IT-Client Support & Services
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