

**Division of Academic Affairs  
Technology Fee – Project Proposal  
2015**

*Proposal Deadline: Wednesday, January 21, 2015*

***Project Proposal Type***

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***Systemic Project***

*Projects proposed by operational units of the university (e.g., colleges, academic departments, Library, etc.) for instructional technology enhancements of unit-wide or university-wide scope.*

*All Systemic Project proposals must be acknowledged (signed) by the operational unit head (e.g. Dean, Chair, Director, etc.).*

***Project Title***

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**Enhancement of 3D Printing Services for Students and Faculty in the Library**

***Total Amount of Funding Requested***

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**\$7293.51**

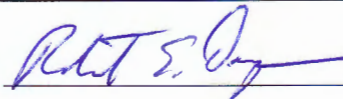
***Primary Project Coordinator***

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**John Barksdale**

***Unit Head Acknowledgment***

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Unit Head Signature: 

Date: 16 January 2015  
*revised 12 February 2015*

**Division of Academic Affairs**  
**Systemic Project Proposal Template**  
**2015**

**Systemic** proposals must provide the following information:

**1. Description of initiative/investment to enhance instructional technology.**

Basic 3D printing and scanning equipment was purchased with library funds and installed in the Skylab in February 2014. A nautilus card reader was also installed in the Skylab by UWF Auxiliary Services in order to collect printing fees from students, faculty and staff. 3D printing is not available to community patrons, as fees collected to cover the cost of materials can only be charged to nautilus cards. This experimental venture has seen high usage and interest by both students and teaching faculty. The goal of this project is to draw upon this success and enhance this service by broadening the scope of 3D printing possibilities for students and faculty by purchasing two 3D printers that have more features and capabilities including the ability to use a variety of plastics, to print in two colors, and to use dissolvable filament for support structures. The dissolvable filament will give us the ability to print infill inside of an object, like the inside of a ball bearing in this example:



*Photo - courtesy of MakerBot Industries.*

These additional features will increase the range of 3D printing possibilities for UWF students.

**2. Description of how initiative has a college/unit-wide or university-wide scope.**

The enhancement of 3D printing in the John C. Pace Library's Skylab will allow the library to continue to provide a valuable learning opportunity that would not be otherwise available. Students from all majors have the opportunity to learn about 3D printing by making their own prints. Familiarity with 3D printing technology is a valuable skill that will help students prepare for careers in fine arts, healthcare, archaeology, computer and electrical engineering, business and other fields. The 3D printer in the Skylab is currently

the only one that is available for use by all UWF students; the addition of two more will be of benefit to the entire university community.

Since installation of one basic 3D printer in February of 2014:

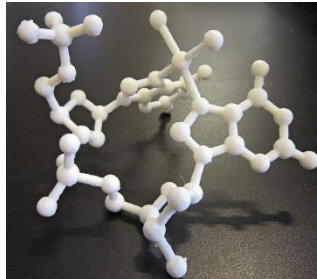
- 157 items have been successfully been printed for students
- 62 items have been printed for UWF classroom use, UWF staff use and 3D printer test/training purposes
- The 3D printer has logged 520 hours of use

### 3. Description of project alignment with UWF Strategic Plan.

**UWF Priority 2.1: Respond to the changing needs of the region, state, and nation by investing strategically to *support innovative instruction* and high-quality, relevant, and distinctive academic and research programs.**

A few examples of support for innovative instruction that have been created with the libraries' existing 3D printing equipment are:

Molecular structures for the Chemistry department



Model of the water bear or tardigrade (Echiniscus species) for Biology student



DNA gel comb for the Biology Lab



Cuneiform tablet for History student



**UWF Priority 4.1: Support and sustain the high quality services and infrastructure needed to achieve identified UWF priorities.**

Currently, the only academic libraries in Florida that offer 3D printing services are the University of West Florida, University of Florida, and St. Petersburg College. As an outcome of having a 3D printer, the University of West Florida Libraries is considered a forerunner in terms of offering desktop 3D printing as a service for students.

The early adaption of basic 3D printing services has shown the academic community in the Panhandle that UWF is a leader when it comes to offering desktop 3D printing technologies as a service.

For example:

In a Google search for "3D Printing Pensacola" on January 2nd, 2015 the University of West Florida Libraries came up as number one, not counting those that paid to come up in Google search first via Google Adwords.



3d printing pensacola

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About 46,500 results (0.21 seconds)

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### 3D Printing | University of West Florida

[uwf.edu/library/about/technology/3d-printing/](http://uwf.edu/library/about/technology/3d-printing/) ▾ University of West Florida ▾

3D Printing. We are now proud to offer 3D printing and scanning as services in the 5th floor Skylab. The services are focused on supporting innovative ...

### 3D printers near Pensacola Fl | makexyz.com

[www.makexyz.com/3dprinters/Pensacola-Fl?ll=30d32917471...](http://www.makexyz.com/3dprinters/Pensacola-Fl?ll=30d32917471...) ▾

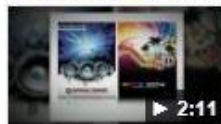
Find 3D printers in Pensacola Fl. Makers and 3D print shops in Pensacola Fl are here to help you make something awesome. Get your 3D prints today.

### Emerald Coast Community Of Makers - Pensacola, Florida ...

<https://www.facebook.com/EmeraldCoastCommunityOfMakers> ▾

We are a makerspace providing members tools, resources, and knowledge to work on projects such as on 3D Printing, remote vehicles, CNC machines, and ...

### Pensacola Printing Companies Dlux Printing Pensacola FL ...



[www.youtube.com/watch?v=Zmn1zUpG8e4](http://www.youtube.com/watch?v=Zmn1zUpG8e4) ▾

May 26, 2012 - Uploaded by dluxprinting1

Pensacola Printing Companies Dlux Printing Pensacola FL at ...

Small Empires: Shapeways and the business ...

#### **4. Description of benefits provided.**

3D prints can take hours to complete. Several times throughout the fall 2014 semester the libraries' one 3D printer was backed up with print jobs and running constantly to construct models for student projects. Some of the prints could not be completed in time and the students had to come up with alternatives. By adding two more printers the library will be in a better position to keep up with demand a peak times.

If our current 3D printer is not operational, we have no backup at this point for student and faculty projects. The addition of two new printers will ensure that students have access to 3D printing if one of the printers is down and in need of repair.

Furthermore, the new printers have capabilities that are not available on our existing 3D printer. Approximately 200 failed experimental prints have been attempted by students and faculty. These failed prints are a part of the learning experience. Some are due to flaws in the 3D models design, while others have failed simply because our current printer is unable to print two different types of plastic simultaneously or handle a variety of types of plastic. The 3D printers, ABS plastic and dissolvable filament selected for this proposal will reduce the number of failed prints and increase the variety of models that we are able to produce.

Here are a few more examples of how expanding 3D printing capabilities the library will enhance instruction at the University of West Florida.

- Art Department 3D design students will have additional access to 3D printing equipment that is not currently available in the Art Department's 3D lab.
- Electrical, Mechanical and Computer Engineering students will have access to up-to-date experimental 3D printing technology to make parts for robotic designs and other projects.
- Archeology, Anthropology and History students have more options for printing artifacts for use in presentations.
- Students from all majors will have state of the art 3D printers that are capable of using a variety of plastics to create prototypes and physical models for class projects.

#### **5. Description of how success/impact will be measured.**

Metrics on printer usage in hours are available as part of the 3D printers' user interface. Data on student and faculty printing is also collected by Skylab staff for all 3D prints. Additionally, Skylab staff interacts with all 3D printing patrons, giving assistance and training in the use of the 3D printing hardware and software. Quantitative and qualitative data for analysis will be derived from these metrics and interactions.

**6. Detailed description of resources required including hardware and software requirements and personnel costs (faculty compensation is not an allowed cost).**

Item	Image	Quantity	Price
MakerBot Replicator 2X Desktop 3D Printer <a href="http://store.makerbot.com/replicator2x?gclid=CNe71q-H0MICFXBp7Aod-koA8g">http://store.makerbot.com/replicator2x?gclid=CNe71q-H0MICFXBp7Aod-koA8g</a>		2	\$5998.00
Makerbot ABS Plastic Filament <a href="http://store.makerbot.com/filament/abs">http://store.makerbot.com/filament/abs</a>		7	\$336.00
Makerbot Dissolvable Filament <a href="http://store.makerbot.com/filament/dissolvable">http://store.makerbot.com/filament/dissolvable</a>		2	\$130.00
Precut Kapton Tape (10 pack) for the MakerBot Replicator 2X Experimental 3D Printer <a href="http://store.makerbot.com/parts-accessories/replicator-2-2x/x10-rep2x-precut-kapton-tape.html">http://store.makerbot.com/parts-accessories/replicator-2-2x/x10-rep2x-precut-kapton-tape.html</a>		2	\$60.00
D-Limonene solvent 100% Organic, 100% Biodegradable, Non-Toxic <a href="http://www.amazon.com/Florida-Chemical-D-Limonene-Gallon/dp/B00HGFTSIW/ref=sr_1_2?ie=UTF8&amp;qid=1420821308&amp;sr=8-2&amp;keywords=d-limonene">http://www.amazon.com/Florida-Chemical-D-Limonene-Gallon/dp/B00HGFTSIW/ref=sr_1_2?ie=UTF8&amp;qid=1420821308&amp;sr=8-2&amp;keywords=d-limonene</a>		1	\$40.49
Wire Security Storage Truck 48 x 24 x 69 with brakes 1200 Lb. Cap,- for storing printers and materials. <a href="http://www.globalindustrial.com/p/material-handling/trucks-carts/security-cage/wire-security-storage-truck-48-x-24-x-69-with-brakes-1200-lb-capacity">http://www.globalindustrial.com/p/material-handling/trucks-carts/security-cage/wire-security-storage-truck-48-x-24-x-69-with-brakes-1200-lb-capacity</a>		1	\$623.00
48x24 Shelf for Storage Truck <a href="http://www.globalindustrial.com/p/material-handling/trucks-carts/security-cage/quick-adjust-shelf-48x24-with-4-hooks-clips-2">http://www.globalindustrial.com/p/material-handling/trucks-carts/security-cage/quick-adjust-shelf-48x24-with-4-hooks-clips-2</a>		1	\$67.95
Stainless steel pan and cover for biodegradable solvent that will be used in new 3D experimental 3D printing process. <a href="http://www.amazon.com/Winco-SPF6-6-Inch-Pan-Full/dp/B001VZ6XP4/ref=pd_sim_k_2?ie=UTF8&amp;refRID=13REC2WZQG14MD2PWS5B">http://www.amazon.com/Winco-SPF6-6-Inch-Pan-Full/dp/B001VZ6XP4/ref=pd_sim_k_2?ie=UTF8&amp;refRID=13REC2WZQG14MD2PWS5B</a>  <a href="http://www.amazon.com/Winco-SPSCF-Size-Solid-Cover/dp/B001VZ58YG/ref=pd_sim_indust_1?ie=UTF8&amp;refRID=0S8TK9696PMVKS0CRAB2">http://www.amazon.com/Winco-SPSCF-Size-Solid-Cover/dp/B001VZ58YG/ref=pd_sim_indust_1?ie=UTF8&amp;refRID=0S8TK9696PMVKS0CRAB2</a>		1	\$38.07
<b>Total</b>			<b>\$7293.51</b>

**Proposed timeline.**

Once the grant is approved and the funds are available, the equipment will be acquired and made available to students within 2 months.

**7. Plan for sustainability beyond conclusion of funding from technology fee, if applicable.**

The funds provided through this technology fee proposal will cover the one-time cost of the 3D printers, start-up and testing supplies and storage equipment. Additional plastic filament for the machines and any future maintenance and repair costs will be covered by 3D printing fees collected from student, faculty and staff nautilus cards.

**8. Resource matching commitments from other organizations/sources (identify organization and amounts), if applicable.**

Not applicable

**9. Individual responsible for reporting and accountability, along with contact information.**

John Barksdale, Skylab Technology Manager  
John C. Pace Library Bldg. 32,  
University of West Florida  
11000 University Parkway  
Pensacola, FL 32514-5750

[jbarksdale1@uwf.edu](mailto:jbarksdale1@uwf.edu)  
850-857-6230