ABOUT THE INSTITUTE...

- The mission of the University of South Florida Institute of Applied Engineering is to provide agile, best value engineering products and services to enhance the performance, effectiveness and safety of our customers. The Institute’s customers include the Department of Defense, other federal, state and local agencies, and industry.

- In support of its mission, the Institute performs applied research in alignment with the following core competencies: Autonomous Systems; Human Performance Enhancement; Data Analytics; Cyber and Electromagnetic Domain Security; and Transportation and Energy infrastructure.

- As a direct support organization of USF, the Institute is a separately incorporated Florida 501(c)(3) authorized to use USF property, facilities, and personal services for the benefit of USF’s research, development, and education mission. As such, the Institute’s operations and research staff collaborate with USF faculty and students to develop and deliver these engineering solutions in support of its customers’ requirements.

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CONTACT US

Institute Rapid Prototyping Facility:
The Institute hosts a rapid prototyping capability at its secure facility in support of select customer projects. This unique capability enables the complete cycle of sensitive manufacturing, testing, reverse-engineering, debugging and validation of system readiness in one space.

Capability Areas
- **Physical Prototyping**
  - Laser cutting polymer and wood media, FDM 3D printers with multiple materials support, saws, drills, forming, welding, and machining equipment

- **Visual Prototyping**
  - Support equipment includes vinyl cutter, paper printers and plotters, Polyjet 3D printers, 3D scanners*, cameras, and microscopes

- **Electronic Systems**
  - Support equipment includes soldering station, electronic test and support equipment, oscilloscopes, network analyzers, function generators, test loads, environmental test equipment*, PCB assembly, and power supplies

- **Software and Programming**
  - Support equipment includes microcontroller and FPGA development tools*, wireless test equipment, RF and radio conditioning, applications and software development computers and environments

*Future capability as we add tools and expand our equipment in all areas
CNC MACHINING

Multi-Axis Milling: Today’s systems require more advanced manufacturing techniques coupled with high end materials. Our milling machine is a 5 axis control 4-axis automatic CNC which can cut everything from Aluminum to Titanium. It is outfitted with a 10 socket auto tool changer and MQL and Flood coolant system.

You will not need to search far and wide for the optimal tools because we stocked them all so you can get working faster! From Nitride and cobalt bits for working with hardened or difficult materials, to HSS for polymer and aluminum, we have you covered.

WELDING AND BUILDING

TIG and Multi-process Welding: TIG welding is the perfect solution to reliably join parts which were fabricated to produce more complex assemblies. Our AC/DC high duty cycle welder and integrated fume exhaust system will ensure that you can work comfortably and safely on your project.

Hand Tools
Whether it is cutting, drilling, tapping, or assembly /disassembly, this lab is fully stocked with everything you need to complete your project. Our suite of quality battery operated tools and stationary cutting and drilling stations will make quick work of any job.
DIGITAL AND TESTING

Electronics Bench: Today’s electronics operate faster than ever and demand equipment that can keep up with the times. We have the latest multi-channel oscilloscopes, high current power supplies, power meters, digital loads, multimeters, you name it!

RF Testing and Compliance: FCC pre-compliance can save money and time as you validate whether or not a design meets the requirements for radio emission. Alternatively, you can study existing systems and analyzer modes of operation.

Load and Environmental Testing: Is your solution going to work in the field? Subject it to some environmental testing where we can heat, cool, vacuum, spray, and drop your system to ensure it will execute its mission free of unexpected failures. You can test the strength of your design and know the true limits of operation with our load testing rig.

3D PRINTING

FDM Rapid Prototyping:
Our FDM 3D print technology allows the fabrication of 5 different material types for ultra-fast prototyping of mission ready parts. An example of this is the TPU 92A material which is a directly manufactured flexible, high-temperature tolerant elastomer. Normally a mold would be needed but we can directly fabricate in a fraction of the time and cost by directly printing the elastomer part. For systems where temperature resistance is important, heat deflection temperatures of up to 230°F ensure that these 3D printed production parts are much more than just decorations for a desk. Abrasion resistant, high impact, and UV and chemically stable polymers for harsh environments are among those in our capability.
INSPECTION AND ASSEMBLY

Stereo Microscope with Computer Interface

Assembly and validation are some of the most critical times in product fabrication. There must be good assurance that the product has been designed according to specification and does not contain defects. Enjoy minimal eyestrain and best posture for those long working ours with our Mantis Elite Microscope Station.

Reverse Engineering

With the included software functions, you can quickly take in existing system and work backwards using CAD tracing or photogrammetry measuring tools. These systems will help you in a variety of soldering and electronics parts identification tasks as well.

DESIGN TO REALITY

High resolution 3D fabrication

Our polyjet printing technology permits the direct fabrication of high resolution molds, physical models, and production small parts faster than any other fabrication method. Your idea or CAD design can become a reality the same day it was designed. This printer can has a broad materials capability including crystal clear parts, high temperature tolerant parts, and flexible parts. It can fabricate geometries not possible using any other fabrication method.

Laser Cutting

Realize your design or quickly mockup a structure with our CO₂ laser cutter. This versatile tools has the ability to vector cut woods, polymers, leather, card stock, and foams, in addition to the ability to mark a wide variety of materials.