
Open access to rapid prototyping and fabrication technologies including:

Woodworking • Luthier • CNC and Conventional Metalworking • Laser Cutting • 3D Printing and Computer Modeling • Cold Casting • Sound Studio & More!

610-332-8665  northampton.edu/fablab

Vice President of Community Education Paul Pierpoint had a vision: create an informal space where engineer, retiree, entrepreneur, artisan ... anyone could access state-of-the-art equipment and expert instruction that promotes innovation. The idea emerged out of the pages of Neil Gershenfeld’s book, “Fab Lab,” where the MIT professor and author described a low-cost facility that allowed people to “build things they need using digital and analog tools.” Inspired, Pierpoint went immediately to work manufacturing Northampton’s version of the concept at the college’s Fowler Family Southside Center. In 2009, the doors to innovation opened.

Three years later, recently retired entrepreneur Jeffrey Boerner discovered Northampton’s Fab Lab and was an immediate fan. He’d seen a tremendous void in basic manufacturing skills over the course of his career and believed strongly that advanced technologies could not exist without this foundation. With this in mind, he began to support its mission, and in short order, his part-time interest soon became a full-time job as program director.

Since then, the Lab has grown from three to 20 instructors and six to nearly 60 courses. Through support from the college, grants and community, it now includes 3D printers, laser engraving, woodworking, guitar building, metalworking, electronics and audio and has quintupled in size.

As impressive as the growth and the technology within the facility is, the quality of its instructors, a self-motivated collection of master craftsmen and highly degreed individuals fuels the fires of the NCC Fab Lab. Most asked to teach at the Lab simply to share their talents in one of the best fabrication facilities in the country.

“We are breaking new ground,” said Boerner. “The Fab Lab is a place where anyone can attain the high-tech knowledge and/or basic skills to fabricate just about anything. We work hard to ensure that the Lab is accessible and affordable to all. We want the Fab Lab to be a great place to relax, enjoy, explore new opportunities and occupations ... and grow.”

Fowler Family Southside Center
511 East Third Street
Bethlehem, PA 18015
fablab@northampton.edu

The Fab Lab is a division of the Center for Business & Industry, Northampton Community College.
Team Building, Tours and Group Learning Activities

Team Building
The Fab Lab offers exceptional, custom-crafted team-building events, with modules developed to achieve identified goals. Small groups are provided with controlled, project-based experiences that require participants to work together toward a common goal. Each individual finds gratification by contributing to the team effort while working with a partner to produce a tangible product. It boosts confidence and ultimately improves productivity ... all while having fun!

Team-building events are organized through the Center for Business & Industry (CBI).

Please call 610-861-5577 for information and scheduling.

Tours
The Fab Lab welcomes individuals and groups of all ages! Simply call or email the Fab Lab to book a complimentary tour. Groups may also call to pre-arrange a material or technical activity, while visiting the Lab, for a small fee. (Quotes are provided by calling the number below.)

Please call 610-332-8665 for information and scheduling.

Learning Modules
Learning activities for credit college students and secondary school students are available and can be tailored to meet substantive curriculum goals. Please call at least three weeks in advance for a complete consultation and to identify which activities would be most beneficial to include in your group’s Fab Lab experience.

Please call 610-332-8665 for information and scheduling.
Processes

Tech Lab
- Electronics and Robotics
- Laser Engraving and Cutting
- Vinyl Cutting
- Computer Modeling and 3D Design
- 3D Printing
- CNC Sphere Bot and Shapeoko Engraving

Wood Lab
- Basic to Advanced Woodworking

Audio Studio
- Audio Mixing Lab
- Sound Booth
- Podcast

Metals Lab
- CNC Milling with Tormach
- Traditional Metals
- Hot Metals
- Sand Blasting
- G-Code
- Traditional Machining

Plastics Lab
- Resin Casting
- General Plastics

Instructors

Audio Engineering
Anthony Lucrezi, Audio Engineer

Fab Lab General Instruction
Henry Ancker, Fab Lab Instruction

Luthier and Woodworking
Jeffrey Boerner, Fab Lab/Luthier Director
Robert Blum, Woodworking
Ken Burton, Woodworking
Gerald Millheim, Guitar Building,
Hand Applied Finishing
Justin Jacobs, Luthier/Pearl Inlay
Justin Odom, Luthier
Dr. Frank DiBussolo, Luthier Historian,
Master Guitar Player
Edward Golden, Luthier
Matthew Lieb, Electric Guitar Building/
Electronics
Ed Youtz, Wood Turning
Dave Dion, Wood Carving

Metals
Joe Pellegrino, Metals

Plastics
Michael Bianco, Plastics/Resin Casting

Tech Lab
Tim Dodge, SolidWorks, 3D printing
and Robotics
Kurt Weinstein, Solid Works
Richard Santillo, Electronics
Peter Lowe, Laser Technology
Lisa Glover, Laser Technology
Brian Feldman, Electronics and Robotics
Michael LeVigne, Master Cam and CNC
Joseph Pellegrino, G-Code/Master Cam
and CNC
## Pricing by Process

### GENERAL PRICING

<table>
<thead>
<tr>
<th>Process</th>
<th>Rate</th>
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</thead>
<tbody>
<tr>
<td>Design Assistance</td>
<td>$60/hr.</td>
</tr>
<tr>
<td>One-On-One Instruction</td>
<td>$45/hr.</td>
</tr>
<tr>
<td>Project Contract Work</td>
<td>Request quote</td>
</tr>
</tbody>
</table>

### 3D PRINTING & SCANNING AND PLASTICS LAB

- 3D Print: Stratasys UPrint (including support material) ........................................ $30/cubic inch
- 3D Print: 3D Print Other (including support material) ........................................... $20/cubic inch
- 3D Print: Ultimaker Metal ......................................................... $30/cubic inch
- Plastics Lab ................................................................. $15/hr. plus materials
- 3D Scan if Available ............................................................ $30/hr.

### TECH LAB

- Computer Lab .......................................................... $5/hr.
- Fusion Laser/Fiber Laser ........................................ Fusion $15/hr. ($25 1st hr. w/instruction) • Fiber $20/hr. ($25 1st hr. w/instruction)
- Electronics (Solder/Test Equipment) ........................................ $10/hr. plus material
- Vinyl Cutter ............................................................ $25/hr. minimum plus materials
- Must be accompanied by tech.

### MATERIALS LABS

- General Woodshop/Equipment Use. ...................................... $10/hr.
- Planer/Drum Sander/Metals ........................................... $15 minimum – more than 20 Bd. Ft. $25 plus $15/hr.
- CNC Router and Tormach ................................................. $30/hr.*
- CNC with Tech Assistance ................................................ $50/hr.
- CNC Tool Path Generation ................................................ $60/hr.
  *Requires certification/completion of CNC operation class

### RECORDING STUDIO

- Use of Studio* .............................................................. $20/hr.*
- Recording with Engineer ................................................ $50/hr.
- One-on-One Audio Instruction .......................................... $60/hr.
  *Requires certification/completion of Fab Lab recording studio class

### GUITAR SETUP & REPAIR

- Use of Shop* ............................................................... $10/hr.*
- Setup with Tech ............................................................ $20/hr.
- Repair with Tech ........................................................... $25/hr.
- Contract Work ............................................................ $40/hr.
  *Requires certification/completion of guitar setup/repair course

**Please call 610-332-8665 to make an appointment.**

Specialty work and/or consultation will be quoted. Payment is required upon project completion or according to negotiated arrangements. Cash/check/credit cards are accepted.

Group tours are free. Group activities will be quoted. Call for appointment and/or scheduling.

NCC credit students may request special pricing for noncourse work.
The Details

What is the cost?
The Fab Lab offers access to easy-to-use equipment and expert instruction, as well as open-enrollment (noncredit) courses and various credit/certificate programs at a very affordable price. For a small fee, use the facility independently during regular business hours or Open Lab hours. Please refer to the fee schedule for an outline of the standard Lab costs. For specific class schedules and any questions, call, email or visit the Fab Lab website using the contact information at bottom right.

What is an Open Lab and what are the hours?
The Fab Lab is open for individual use on weekdays from 9 a.m. to 4 p.m. You can schedule to work in the Lab anytime during the week. Open Lab is off-hours and can include weekends, holidays and nights when the Lab is not being used for classes. These Open Lab hours are scheduled weekly and fees vary, so check the fee schedule or call with questions. To view or book available times, call or email the number below.

Who uses the Fab Lab?
From teen to senior, novice to skilled, the Lab attracts engineers, artists, artisans, entrepreneurs, musicians, teachers, students and the curious at heart. Looking for a new hobby? Are you an inventor with a great idea? Do you need to acquire the skills to execute? Every level can benefit by our impressive collection of equipment, tools, technology and intellectual resources.

Do I have to know how to use the equipment to access the Lab?
No. Experienced staff are on hand to train the novice on our equipment and state-of-the-art technologies, Monday through Friday from 9 a.m. to 4 p.m., or by appointment. Simply call or visit the Lab to schedule one-on-one instruction or inquire about one of our 50-plus courses.

I know how to use the equipment. Can I book time on a machine?
Yes. A member of our staff will work with you initially to ensure you are familiar with the equipment and our safety procedures. After that, you are free to book and use the equipment for a small hourly fee.

Do you offer consulting services for inventors and entrepreneurs?
Yes. Contract our Lab staff for technical support for business and prototyping projects. Or, if you are an entrepreneur, we’ll provide resources and contacts to local agencies and organizations to help you get your idea off the ground.
Equipment of Note

Tech Lab
- Stratasys uPrint
- Rostock Delta Printer
- 2 Printer Bots
- Ultimaker 3D
- Next Engine Scanner
- Epilog Fusion Laser
- TROTEC Laser/Dual Tube/Through Access
- Roland Vinyl Cutter
- Soldering Stations and Reflow
- 60˝ Plasma Screen

Wood Lab
- 25˝ Spiral-Head Planer
- 12˝ Jointer
- 26˝ Dual Drum Sander
- Techno CNC Router
- 2 10˝ Table Saws
- Oscillating Drum and Edge Sanders
- 2 Band Saws
- 5 Wood Lathes
- 2 Drill Presses
- 16˝ Dewalt Radial Arm Saw
- Dust Collection
- Computer Climate Control

Laser Cutting

3D Printing and Computer Modeling

Cold Casting

Sound Studio & More!

Fab Lab Basic Intro Courses
- 3D Printing and Solid Works
- Prototyping Skills Level 1 and 2
- Master Cam
- Sketch Up
- Laser Etching and Cutting
- Mold Making and Plastics
- Electronics
  - Arduino 1 and 2
  - Robotics Programming
  - Stomp Box for Guitar Players
  - Tube Amp Building Class

Sample Course Offerings

Web Lab
- Fab Lab Basic Intro Courses
- 3D Printing and Solid Works
- Prototyping Skills Level 1 and 2
- Master Cam
- Sketch Up
- Laser Etching and Cutting
- Mold Making and Plastics
- Electronics
  - Arduino 1 and 2
  - Robotics Programming
  - Stomp Box for Guitar Players
  - Tube Amp Building Class

Luther (See the supplemental program brochure for certifications and courses.)

Woodworking Basics and Beyond the Basics
- Wood Turning
- Wood Carving
- Chair Building
- Exotic Box Making (Incra Technology)
- Inlay for the Woodworker
- Inlay for the Guitar Maker
- French Polishing and True Oil Finishing
- Nitrocellulose Lacquer
- Advanced Modules in Woodworking

Audio Recording and Mixing

Metalworking
- Milling Machine Setup and Operation
- CNC Lathe machine Set Up and Operation
- CNC Milling machine Set Up and Operation
- Manual Metal Lathe Operations
- Machining on a Bridgeport Mill

Woodworking

Luthier

CNC and Conventional Metalworking

Laser Cutting

3D Printing and Computer Modeling

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Taught by master craftsmen in a sharing environment, Fab Lab woodworking courses encompass a growing number of skill areas. Beginning with Woodworking Basics, you’ll have the opportunity to interact with other students who are enrolled simultaneously in carving, turning, guitar building, laser engraving, inlaying and more. Our unpretentious, can-do climate will inspire you to safely explore your many creative options and engage in even the most challenging skills-training programs before finding your main area of interest.

**Sample Woodworking Equipment**
- 25” Spiral-Head Planer
- 12” Jointer
- 26” Dual Drum Sander
- Techno CNC Router
- 2 10” Table Saws
- Oscillating Drum and Edge Sanders
- 2 Band Saws
- 5 Wood Lathes
- 2 Drill Presses
- 16” Dewalt Radial Arm Saw
- Dust Collection
- Computer Climate Control

**Sample Woodworking Courses***
- Wood Turning I and II
- Wood Carving I and II
- Chair Building
- CNC for the Woodworker
- Laser Inlay for the Woodworker
- Introduction to Furniture
- Advanced Machine and Tool Modules
- Hand Tools
- Woodworking Basics
- Woodworking Beyond the Basics (Cabinetry)
- Router
- Table Saw
- Sharpening, Scraping and Sanding
- Jigging
- Band Saw and Drill Press
- Finishing
  - Nitrocellulose Lacquer
  - French Polishing, Filling and True Oil Finishes
  - Tinting and Advanced Spraying Techniques

*Check Northampton.edu/fablab for complete course dates and information.

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**FAB LAB**

**REGULAR HOURS:**
9 a.m. to 4 p.m.

**OPEN LAB:**
Open Lab is off-hours and can include weekends, holidays and nights when the Lab is not being used for classes. Check our details sheet for more information or call the number below.

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Metalworking

Taught by experts, our Fab Lab instructors break each metalworking process down into easy, step-by-step techniques designed to dispel the myths of the craft and help even the novice become proficient.

Conventional skills are taught from the ground up to ensure that participants finish with a well-rounded knowledge of metalworking and an ability to create assemblies with an accurate fit and finish. Mastery of basic skills are not required given today’s advanced technology, though most are covered in class.

Participants also learn how advanced computer milling and machining fit into an all-encompassing metals program by following a product through its prototyping, testing and marketing stages. This helps create a working knowledge of almost every metal manufacturing process the Fab Lab has to offer.

Though not all prototyping or idea building can be achieved through computer manufacturing, either additive or subtractive, most conceptual and tangible prototyping is accomplished with basic tools. This is followed by assembly techniques that require knowledge and skill in hand tools, welding and fastening techniques.

Instruction is available in both classroom or one-on-one skills training. Participants are encouraged to have an end goal to add value and motivation to their experience.

Sample Metals Lab Equipment
- Solidworks and Inventor for Metals
- Basics of Conventional Machining
- Master Cam and Machining
- CNC Machine Techniques
- G-Code (Writing and Editing)
- Make Something Cool on the Tormach CNC

Sample Metalworking Courses*
- Anodizing
- Welding
- Aluminum Casting
- Heat Treating
- Sheet Metal Fabrication

*Check Northampton.edu/fablabs for complete course dates and information.

REGULAR HOURS:
9 a.m. to 4 p.m.

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Technology Lab

The Tech Lab offers diverse and abundant equipment to help you create and experiment using the latest tools. Begin in our computer classroom where a multitude of ideas can be drawn and conceived using programs such as Solidworks, Inventor and MasterCam. Turn those ideas into a solid object using the Lab’s collection of 3D printers, including a uPrint prototyping machine capable of printing multiple materials at the same time.

Laser technology is also available to everyone with a minimum of training. Our lasers are versatile, equipped with 60- and 80-watt laser tubes, fit 39 inches of material and are perfect for engineers, architects, artists, woodworkers, metalworkers and guitar builders who use the laser for cutting, engraving and inlaying.

You’ll also find great inspiration by interacting with people from other disciplines, including woodworkers, guitar makers, metalworkers and more who are working on their own projects within the facility. So whether you’re a model maker, model train enthusiast, jeweler or something in between, come in ... and explore.

Sample Tech Lab Equipment
- Arduino
- Robotics
- Guitar Hot Rodding
- Amplification Both Tube and Solid State
- CNC Technology

Sample Tech Lab Courses*
- Solidworks I and II
- 3D Printing and Cold Casting
- Master Cam
- G-Code Writing and Editing
- Sketch Up
- Auto Cad
- Corel Draw and the Epilog Laser
- Make Something Cool on the Laser I and II
- Arduino I and II
- Robotics – Sensors and Arduino Programming

*Check Northampton.edu/fablab for complete course dates and information.

REGULAR HOURS:
9 a.m. to 4 p.m.

OPEN LAB:
Open Lab is off-hours and can include week-ends, holidays and nights when the Lab is not being used for classes. Check our details sheet for more information or call the number below.

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Audio Lab/ Sound Booth

Whether you want to lay down a soundtrack for your latest iPhone® video, GoPro® movie or Kickstarter campaign or are simply interested in learning how to control and master music, you can do it in the Fab Lab.

Audio, i-movie and other video programs can be created in our studio with optional assistance from our professional engineer.

Luthier Program participants: Use the controlled environment within our booth to record and compare the guitars you build in the Lab. Even test resonant frequencies prior to putting an instrument together!

Sample Studio Options
- Create and Record Music
- Mix Existing Music using Pro Tools or Logic Pro
- Sound Effects and Arduino Control
- Audio Book Reading and Mixing
- Audio Testing
- Podcast Technology

Sample Studio Courses*
- Home Acoustic Treatment
- Music Production and Recording Techniques
- Podcasting for the Beginner

*Check Northampton.edu/fablabor for complete course dates and information.

REGULAR HOURS:
9 a.m. to 4 p.m.

OPEN LAB:
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Plastics Lab

Plastic technology and basic skills are a vital part of any prototyping program. As part of our commitment to provide a facility where you can learn and make almost anything, we offer casting and machining tools. We also support the creation of products in plastic with other relevant processes including CNC milling, woodworking, 3D printing, lasering and more.

Plastic Lab Equipment

- Extrusion
- Vacu-Forming
- Injection Molding
- Resin Casting
- Bending and Milling

Sample Plastics Courses*

- General Plastics I and II
- Copy Any Shape Resin Casting and Mold Making

*Check Northampton.edu/fabl for complete course dates and information.
Luthier Program

The Fab Lab Luthier Program combines old-world craftsmanship with modern manufacturing to guide participants through the fine art of building an instrument that is both rich in sound and beauty. From laser engraving and inlay, cutting the neck and exploring exotic woods to spray booth techniques and tonewood resonance testing, participants are encouraged to dream, innovate and create using the facility’s comprehensive Lab tools and the guidance of master luthiers.

Years in the making, the Luthier Program at Northampton Community College has increasingly expanded its program with tooing, lab and classroom space, instruction and technology. It means that you will get the best, most comprehensive training in the art, science and mechanics of guitar building available anywhere. And, you will get that education at a price you can afford.

What makes Northampton’s program special?
Northampton Community College is only 12 miles from C.F. Martin. As a select member of the certification class, you will have an opportunity to tour the factory. Martin Guitar is the oldest and most prestigious guitar manufacturing company in the world. Although you will be learning how to build your instruments from scratch (step by step), you will also be introduced to the technology that is incorporated into manufactured guitars, including CNC, 3D printing, resin and carbon fiber, laser engraving/inlay, electronics and more. Advanced technical knowledge, coupled with the mastery of old-world skills, will help you apply your earned NCC Luthier Certification to a wide range of opportunities.

SOUND BOOTH ACCESS: All Luthier participants are also welcome to utilize the controlled environment within the Fab Lab Sound Studio booth to record and compare the guitars built on site. You can even test resonant frequencies prior to putting an instrument together!

Luthier Certification

INFORMATION SESSIONS: Enjoy a free, two-hour information session on the Luthier Certification Program, including curriculum details, Lab tours and more. Call or visit northampton.edu/luthier for the most up-to-date schedule dates and information.

### REQUIRED COURSES

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>COURSE COST</th>
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<tbody>
<tr>
<td>FABGA100</td>
<td>Acoustic Guitar Building: The Basics</td>
<td>$1,249.00</td>
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<tr>
<td>FABGA101</td>
<td>Acoustic Guitar II: Flat Top</td>
<td>$1,075.00</td>
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<tr>
<td>FABGA103</td>
<td>Electric Guitar Building</td>
<td>$899.00</td>
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<td>FABGT104</td>
<td>The Evolution of the Guitar</td>
<td>$139.00</td>
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<td>FABGT331</td>
<td>Guitar Setup, Repair and Maintenance Certification</td>
<td>$269.00</td>
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<tr>
<td>FABGT501</td>
<td>Building a Ukulele</td>
<td>$384.00</td>
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<tr>
<td>FABWD100</td>
<td>Woodworking Basics</td>
<td>$229.00</td>
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<tr>
<td>FABGT104</td>
<td>Finishing: Hand Application Techniques</td>
<td>$148.00</td>
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**TOTAL COST FOR MANDATORY CLASSES** $4,392.00

### ELECTIVE CLASSES (2 Required)

<table>
<thead>
<tr>
<th>COURSE CODE</th>
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<th>COURSE COST</th>
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</thead>
<tbody>
<tr>
<td>FABGA105</td>
<td>SolidWorks for Guitar Design</td>
<td>$169.00</td>
</tr>
<tr>
<td>FABGT102</td>
<td>Stomp Box: Design, Build and Rock On</td>
<td>$129.00</td>
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<tr>
<td>FABGT103</td>
<td>Tube Amp: The Ultimate Build</td>
<td>$289.00</td>
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<tr>
<td>FABGT202</td>
<td>Archtop Guitar Building</td>
<td>$1,160.00</td>
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<tr>
<td>FABGT330</td>
<td>Pearl and Material Inlay</td>
<td>$289.00</td>
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<tr>
<td>FABMC110</td>
<td>CNC with MasterCAM</td>
<td>$209.00</td>
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<tr>
<td>FABWD510</td>
<td>Laser Inlay and Engraving for the Guitar Builder</td>
<td>$95.00</td>
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**AVERAGE TOTAL COST OF 2 ELECTIVES** $500.00

**TOTAL COST OF CERTIFICATE BASED ON AVERAGES** $5,300.00

### MODULES (1 Required)

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<th>COURSE CODE</th>
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<tbody>
<tr>
<td>FABEX103</td>
<td>Fab Lab and the Entrepreneur</td>
<td>$45.00</td>
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<tr>
<td>FABWD500</td>
<td>Mastering the Table Saw</td>
<td>$69.00</td>
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<tr>
<td>FABWD501</td>
<td>Mastering the Router</td>
<td>$148.00</td>
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<tr>
<td>FABWD509</td>
<td>The Three-Hour Box</td>
<td>$79.00</td>
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**AVERAGE COST OF MODULE** $85.00

For luthier-specific questions:
610-332-8665 northampton.edu/luthier

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