



May 22, 2020

Design/Drafting

- From John Peros, Autodesk - AutoDesk Design Academy – students and educators can access free design software, along with free educational resources in manufacturing, construction, and production—including self-paced online courses, guided webinars, tutorials, industry contests, class projects, and curriculum for all levels. <https://academy.autodesk.com/>
- From Sal Lascola: Monterey Trail HS EGUSD, AutoCAD Web App, Edit, create, and view CAD drawings in the web browser on any computer for FREE. <https://autode.sk/2zdehol>
- From John Peros, Autodesk – Fusion 360 – self paced learning, Each course includes videos, step-by-step tutorials, and downloadable 3D models to help you learn Fusion 360 at your own pace. <https://f360ap.autodesk.com/courses>
- OnShape [Onshape Education Registration Form](#) (free for students and educators)
 - **Classroom Set Up** - [How to Set Up Your Onshape Classroom](#) for helpful tips on getting started.
 - Check with your IT department to ensure that your students will receive emails from Onshape. View the [Security and IT Checklist](#) for more details.
 - [Onshape Education Instructor Guide](#) features tips, best practices and additional resources.
 - [Instructor Community](#) share, adopt and discuss CAD projects and curriculum for the classroom.
 - [Onshape Fundamentals: CAD](#) and [Introduction to CAD learning pathways for users to get familiar with CAD and basic features and capabilities](#).
 - **Student Exercises** - The following exercises are designed specifically for students, with attention-grabbing graphics and activities that support meaningful learning experiences:
 1. [Eyeglasses Editing Exercise](#)
 2. [Gyrosphere Modeling Exercise](#)
 3. [Molecule Assembly Exercise](#)

Disinfecting

- May 7, 2020 from CDC - <https://www.cdc.gov/coronavirus/2019-ncov/community/reopen-guidance.html>

Electronics

- TINKERCAD From Randy Sanafran, Autodesk – TinkerCAD – is a FREE, easy to use web app for 3D design, electronics and coding. Tons of resources:
<https://www.tinkercad.com/learn/circuits>
 - This is the first in the series of weekly design challenges we are posting:
 - These two posts have good resources in terms of pointing people towards the in-app learning tools and other existing resources:
 - <https://blog.tinkercad.com/explore-tinkercad-resources-for-distance-learning>
 - <https://blog.tinkercad.com/parents-guide-to-starting-kids-in-tinkercad>
 - This one shows how to create a teacher account and setup a virtual classroom in Tinkercad: <https://blog.tinkercad.com/2019/08/05/introducing-tinkercad-classroom/>
 - Here is where we will be posting daily content for students. A lot of the content is geared more towards a 5-8 grade audience, but may be helpful for beginners: <https://blog.tinkercad.com/tag/teachers-parents>
 - The Tinkercad hub on Instructables has hundreds of example DIY projects that use the software: <https://www.instructables.com/tinkercad/>
 - These are some PD tutorials centered around Tinkercad:
<https://www.instructables.com/member/Tinkercad%20for%20Education/instructables/>
 - Finally, this is a good primer for students to get introduced to Tinkercad and 3D printing, but may not be useful at home: <https://www.instructables.com/class/Easy-3D-Printing/>
- Multisim - <https://www.multisim.com/> Multisim Live offers an intuitive schematic layout experience in a web browser. With the familiar Multisim interface, component library and interactive features ensures you can capture your design with no difficulty. Schematics can be accessed on any computing or mobile device and shared from any supported browser.
- Jon Zeh, Sac City College – virtual circuit trainer
https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html

Machining – Manual & CNC

- From Rob Haworth: Laguna Creek HS EGUSD, Tomach – PathPilot HUB is a cloud-based, full-featured Tormach simulator. <https://hub.pathpilot.com/try>
- From John Peros, Autodesk – Fusion 360 – self paced learning, Each course includes videos, step-by-step tutorials, and downloadable 3D models to help you learn Fusion 360 at your own pace. <https://f360ap.autodesk.com/courses>
- Immerse 2 Learn - <https://web.immerse2learn.com/web/> courses for CAD, CAM, Inspection, manual machining an core skills.
- Sandvik - e-learning resources for metal cutting.
<https://www.sandvik.coromant.com/en-us/services/education/pages/e-learning.aspx?f=1>

- NCSIMUL Machine is comprehensive G-Code verification software for smart CNC machining, including machine simulation and toolpath optimization prior to transferal of code to CNC machines.

Interfaced with CAM software and based on virtual machines that are digital twins of your real machines, it ensures the accuracy of your NC code.

1. NCSIMUL - <https://www.ncsimul.com>
 - a. Possible that you can have your students remotely access this using a remote desktop such as Splashtop or Chrome Remote Desktop.
2. Immerse2Learn - <https://web.immerse2learn.com/web/product/>
3. Haas Online. They have an entire certification program that runs 20 to 30 hours and leads up scheduling an in-person certification if they want.
<https://learn.haascnc.com/?fbclid=IwAR13kMjYaiTmc9MUEZlGfzJFKzvz2Cn7Wrnh3PAqDh2blQ-pNUv3hV2rHHI>

Mechatronics

Thanks to Roy Ingram, Mechatronics, Sierra College, for sharing these on the May 5 Shop Talk: [Mechatronics video](#) and Sierra College Mechatronics website: [Real Skills Real Jobs](#)

On Line Courses and Lessons

- From Dan Turner, Yuba Community College, CTE Coalition - choose from a variety of industry leaders offering resources for remote learning opportunities. Scroll down on their home page to view the list of company's offering resources. <https://ctecoalition.com/>
- [udemy.com](https://www.udemy.com) Lots of classes, many are free. Use the filter to find the free classes. Classes on electronics and Arduinos
- [bayareamanufacturingcareers.com](https://www.bayareamanufacturingcareers.com) Click on the 'more' tab, then scroll down to the K-16 discussion forum. Chalk full of ideas and resources for online instruction. Categories: CAD/CAM, Electronics, Machining (Manual / CNC), robotics (VEX / other), welding.
- www.cteonline.org Butte County Office of Education – lots of lessons in a variety of CTE disciplines.

- <https://www.smctraining.com/en/newpage/newsdetail/1540> - (AutoSIM-200 license) With this software, it is possible to carry out simulations using pneumatic, electro-pneumatic, hydraulic, electrohydraulic, electrical and electronic circuits. It is also possible to carry out virtual systems controlled by the virtual PLC that it is included
- SME Tooling U - Contact Lori for a free login and password for an introductory account
Lori Byrne Account Executive Workforce Education , Workforce Education Group Tooling U - SME
| www.toolingu.com www.sme.org
Lori.byrne@toolingu.com | Office: 216-706-6635 | Fax: 216-706-6601
- 3D Printing <https://www.instructables.com/class/Beginner-3D-Printing-Class/>
- Design Academy - Di Jin : Design Academy has a lot of content to teach and learn. All the classes are well designed and you can simply point students to there to learn. There are lots of content not related to a specific tool, too. <https://academy.autodesk.com>

Other

- Summer Teacher training, from Parallax: Free to technology educators in the U.S, each of these courses feature the **cyber:bot robot with micro:bit** and introduce Python programming, electronics, and cybersecurity following the **cyber:bot tutorial series**. Each course includes three 90 minute Zoom meetings, with homework in between. Parallax Inc. will be hosting two of the courses, and NICERC will be hosting the other two.

<https://mailchi.mp/parallax/parallax-expands-distance-learning-for-tech-educators>
- Comparing Design and Engineering - Randy Schuster, American River College
https://docs.google.com/presentation/d/1o9QmGQytyAmrmRf9FhS_8s8mciBq7KzJ-3xM2hSUxxl/edit?usp=sharing
- ARC Design Hub – Instagram <https://www.instagram.com/arcdesignhub/?hl=en>

Proctoring on-line exams

1. <https://web.respondus.com/he/lockdownbrowser/pricing/>
 - a. Lockdown - A free, 2-month trial of LockDown Browser is available to institutions that use Blackboard Learn, Brightspace, Canvas, Moodle, Schoology, or Sakai. This is the best way for an institution to try all features and functionality with their learning management system. See details below on “Getting Started with a Free Trial.”
2. <https://www.proctortrack.com/proctorlock/>
 - a. Proctorlock - A cost-effective and smart prevention solution for secure test monitoring and attendance verification. Detects 11 unique testing violations.

3. <https://www.proctoru.com/>
 - a. ProctorU - Online proctoring to advance your learning and testing program. Validate knowledge. Reduce costs. Expand access.
4. https://www.safeexambrowser.org/about_overview_en.html
 - a. Safe Exam Browser - Safe Exam Browser is a web browser environment to carry out e-assessments safely. The software turns any computer temporarily into a secure workstation. It controls access to resources like system functions, other websites and applications and prevents unauthorized resources being used during an exam.

Projects

Craig Todd, Monterey Trail HS: I have a digital dice unit that only costs \$20 per unit. I designed the PCB.

Robotics Software

- Fusion for Chromebooks – Mark Martin & Di Jin: To get access to Fusion 360 on a Chromebook (or older computer). Sign up to get access to our virtual machines at: <https://forms.gle/9wuhNvzUFYD626Wo6>
- Python Programming: From - Jim Burnham

I have a google site where I keep resources for programming in python -

<https://sites.google.com/view/steam-clown-mechatronics/units/unit-6-programming/unit-raspberry-pi-python?authuser=0>

1) here is a great on line class my Dr Chuck from the University of Michigan www.py4e.com

2) here is a good online browser based coding IDE - www.repl.it

if you have any questions contact me - Jim Burnham - Mechatronics Engineering Instructor @ Silicon Valley CTE jim.the....@gmail.com

Student Interaction

- From Sal Lascola: Monterey Trail HS EGUSD, Here is a great video for allowing your students to interact directly with a document like a worksheet. https://m.youtube.com/watch?v=sd_QN3Jcnao
- From Ian Duncan Kinney HS FCUSD: Soapbox is FREE, easy to use tool to record, edit, and share videos in minutes <https://wistia.com/soapbox>
- From Rob Haworth: Laguna Creek HS EGUSD, Create screencast videos with our screen recorder. It's fast, free and easy to use! Capture your screen, add a webcam and use narration to customize your video. <https://screencast-o-matic.com/>
- From Rob Haworth: Laguna Creek HS EGUSD, Online interviewing skills, OSHA 10, and more.

<https://www.careersafeonline.com/>

- From Jon Zeh: Sacramento City College, Using a document camera to record a lecture and push the video out to students.
 - From Dan Turner, Yuba Community College, Use Camtasia to record and create professional-looking videos on Windows and Mac <https://www.techsmith.com/video-editor.html>
 - From Rob Haworth: Laguna Creek HS EGUSD, iMovie, With iMovie for iOS and macOS, you can enjoy your videos like never before. It's easy to browse your clips and create Hollywood-style trailers and stunning 4K-resolution movies. You can even start editing on iPhone or iPad, then finish on your Mac. <https://www.apple.com/imovie/>
 - From Dan Turner, Yuba Community College, CTE Coalition - choose from a variety of industry leaders offering resources for remote learning opportunities. Scroll down on their home page to view the list of company's offering resources. <https://ctecoalition.com/>
 - EdPuzzle.com Free YouTube video editing site. Edit the length of a video, insert your voice-over, and embed questions students need to answer before they can proceed viewing the video. Can link student progress to teachers grade book, Interacts with many LMS'.
 - Spatial Viz app - allows students to sketch orthographic and isometrics on a smartphone or tablet. The sketches are graded automatically and students receive personalized hints when stuck. The immediate personalized feedback is especially well suited for remote learning. During the current COVID-19 school closures and recognizing that remote instruction may extend for a while, we are offering free accounts for teachers and students through the end of summer. Egrove.education
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Teacher's YouTube Channels

- Rob Haworth – Laguna Creek HS, Manufacturing Production Technology Academy YouTube channel
<https://www.youtube.com/channel/UCzyR1tuyCUBYIUQyOKwbDsg/featured>
- Dan Frank – Rocklin HS, Engineering and Manufacturing
<https://www.youtube.com/channel/UCSF3hiN8UZoy12JVqYz3oKw>
- John Fuller – Roseville HS, Manufacture Engineering
https://www.youtube.com/channel/UCEDvxIWVEKK-RpqJllkB92w?view_as=subscriber
- Sierra College Engineering & Physics
<https://www.youtube.com/channel/UCARFaqKMJMou0i5fa6p03Mg>

Welding

- <https://openbook.millerwelds.com>

- <https://awo.aws.org>
- Tooling U SME - <https://www.toolingu.com> - has over 500+ online courses related to manufacturing. They are offering CA teachers a free, 90-day access to their platform to evaluate it's use for your classroom

Thank You

Thank you to the instructors who suggested these resources on the Shop Talk calls sponsored by Edu2Mfg, the North Region Advanced Manufacturing Initiative of the California Community College Chancellor's Office.

Find more updated resources at

- Instructor Resources: <https://edu2mfg.org/news/category/instructor-resources>
- Recoded Shop Talk calls: <https://edu2mfg.org/news/category/shop-talk>
- Map showing regional manufacturing education programs: <https://edu2mfg.org/map>