Roughrider Area Career & Technical Center
Directors Report
October 2018

Meetings/Activities

October 24 at 3:45 Room 312 DHS – Health Science Advisory Meeting

November 7 at 6:00 Klinefelter 106 – RACTC Board Meeting

November 8 at 10:30 Williston State College – CTE Director Collaboration meeting

High Technology Equipment

The second rotation has been completed. The next rotation is scheduled for November 19. The second laser engraver has been configured and is ready for pickup and delivery.

Below is a list and description of the training workshops that will be offered in the next few months. Please feel free to share this with your schools and instructors. All training will take place at Global Technology Inc (see address below) in Mandan. The training runs from 8:30am-4:30pm (CT) each day. Grad credit from UND will be available. Anyone can register by contacting Michele Renner.

Module	Date(s)	Location	Status
3D Printing	October 19-20, 2018	Mandan	Open for Registration
Mastercam Art	October 29-30, 2018	Mandan	Open for Registration
Bio-Chem	November 13-14, 2018	Mandan	Open for Registration
Robots	December 4-5, 2018	Mandan	Open for Registration
CNC Machining	December 17-18, 2018	Mandan	Open for Registration
Graphic Production	January 10-11, 2019	Mandan	Open for Registration

3D Printing - The training covers use and operating of the 3D printer and the software used to drive the printer. This course is applicable to all curriculum areas. A trained staff member is required for your school to get this module.

Mastercam Art - The training opens up the option for 3D machining on the CNC Mills and Routers. We will be joined in the training by the head of Mastercam Education, Dan Newby. This training is the vehicle to the next step for anyone that used the CNC machines.

Bio-Chem - The training covers the use of the Bio-Chem module. Participants have an opportunity to conduct restriction analysis of DNA and extract DNA from live plants. An amazing opportunity for any Ag, Tech or science instructor.

Robotics - The training teaches the core concept of industrial robotics using the Labvolt 5100 robots. This module provides the foundation skills for the study of robotics, automation, remote control and industrial programming logic. Perfect for agriculture, tech and science or any STEM program.

CNC Machine - The training covers the basic concepts if automated machining and operation of the CNC mills and routers. The mills are smaller and quieter than the routers so they can be used in a classroom setting. CNC Machining is the epitome of STEM. The mills are awesome for hands on math.

Graphic Production - This course teaches the operation of the laser engravers and the BN-20 vinyl cutter/printers. It can be used in agriculture, tech, graphic design, computers, art, business, FACS, marketing or just about any program.

Please contact Michele Renner if interested.

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Health Science Program

We have a Health Sciences Advisory Committee meeting on October 24 in Dickinson. All CTE programs are required to have a diverse committee representing their communities and meet twice a year to receive funding. If any board member wants to attend you are surely welcome. We will be discussing current course offerings, field trip to the UND Medical School, RACTC/DSU nursing practicum and clinical rotations.

CTE Advisory Committees

The Advisory Committee's purpose is to strengthen the CTE program it serves. The committee exists to advise, assist, support and advocate for career and technical education It has no legislative, administrative or programmatic authority and is advisory only. Advisory Committees work cooperatively with school officials in planning and carrying out committee work. Members are volunteers who share an expert knowledge of the career tasks and competency requirements for specific occupations. The committee may serve several programs.

- Advise – Advisory Committees assess specific areas of the CTE program. Suggestions are designed to improve specific content areas. Such suggestions could include industry standards, the updating of curriculum, purchase of new instructional materials or equipment to modernize the classroom and to adopt safety policies. Suggestions should be presented in writing to the administration.

- Assist – Advisory committees help the instructor or Administrator carry out specific activities. These activities could include judging competitive skills events, setting up a scholarship program or obtaining media coverage for special events.
- Support and Advocate – Advisory Committees promote CTE programs throughout the communities they serve. Promotion or marketing could include identifying industry and community resources, talking to legislators, speaking for career and technical education at board meetings, writing articles for local newspapers or arranging for publicity.

RACTC Website

The RACTC website has been updated and now includes the RACTC by-laws and fee structure. The website can be found at **http://ractc.weebly.com/.**

I would like to thank Shelly Christensen, Business Education Instructor Glen Ullin, for updating this site as needed.

CNC Router Article

The RACTC delivers two CNC routers to member schools. There is a MasterCam Art workshop on October 29 and 30 that will teach instructors how to router in 3D.

What Is CNC Woodworking

CNC woodworking is an automated form of woodworking, where a machine cuts, shapes and engraves wood without any human interference, after the initial setup. The full form of CNC is "computer numeric control". Don't fret over how complicated that sounds, it basically means a machine controlled by a computer.

The most common kind of a woodworking CNC machine is a CNC router. There are other kinds as well such as CNC drills and CNC lathes. The difference is that these machines are specifically designed for a specific purpose whereas the CNC router is as versatile as a router can be, and arguably faster and more accurate than a regular router. It can cut, shape and engrave at high speeds with absolute accuracy and do the task repeatedly with consistent results. Lets learn a little more about the CNC woodworking router.

What is a CNC router?

A CNC router is a regular router connected to a computer controlled system. It is positioned over a flat bed or a table and is capable of moving over it according to the instructions that are given to it. A CNC router gets its instructions from a computer that can be attached to it. However, there are many models that can perform many woodworking tasks from their own interface and program. These do not need to be connected to a computer unless you need specific tasks done with require external data to be given to the machine.

A regular CNC router can move along 3 axis, the X, Y and the Z axis, which means that it can move sideways, backwards and forwards as well as up and down. Using these movements, a CNC router can cut, shape and engrave wood. Then there are also 5 axis routers that are capable of performing very complex woodworking tasks.

Example of jobs that a 5 axis CNC router can handle includes: Turning round, square and 8 sided spindles, making a tapered leg with a rope twist, adding inlay, joinery and carving, cutting identical pieces repeatedly with precision and creating all kinds of joints like lap joints, rabbit joints, dovetails, mortise and tenon and sliding dovetails.

Can you operate a CNC router without programming knowledge?

The CNC router takes its commands from a computer and a programming language like G Code. But the new models of CNC routers do not require you to learn the language to operate them. You can perform a lot functions using the build-in functions of the machine. For example, the software that comes with the CNC router only requires you to answer a few questions to do tasks like cutting, engraving, making joints etc.

Drawings can be imported, you can make them using a CAM/CAD program. There are many vector designs available online that you can use. The software that comes with the CNC router allows you to use these drawings, but automatically converting them into a series for instructions for the router.

The result is that you can do some very complex and beautiful wood work designs using your CNC router.

Besides, learning a little bit of the G Code is not difficult and rewarding. With simple commands you can create or modify a project quiet easily.

There are many CAD/CAM software that are used to draw shapes for CNC like ArtCam, Aspire, AlphaCAM and basic G Code. Almost all of them come with training material as well as online tutorials to help you learn to use the software. Once you learn to use a software like this you will be able to cut your own intricate 3D shapes and ornate carvings.

All this should not intimidate you against using a CNC router. It is a learning curve like learning to use any other tool. You will be able to start with simple projects quiet easily. As you get more proficient you can start making more complicated projects. It is very rewarding to explore the full capabilities of your CNC router.

CNC Job Opportunities

Job opportunities related to CNC

There is quite a shortage of skilled people to utilize CNC machines. And the shortage is growing. Everywhere I go I hear manufacturing people claiming that they cannot find skilled people. Unfortunately, it has also been my experience that pay scales have not yet reflected this shortage. Even so, you can make a good wage and develop a rewarding career working

with CNC machines. Here are some of the job titles of people working with CNC machine tools.

Working for manufacturing companies:

- CNC helpers
- CNC tool setters
- CNC operators
- CNC setup people
- CNC programmers
- CAM system programmers
- CNC maintenance personnel