COLLEGE OF ENGINEERING, TECHNOLOGY, AND MANAGEMENT

(a) Department of CSET (Computer Systems Engineering Technology)

BS Software Engineering Technology
1. ThinQrite – Expert Reasoning System
2. otashu – Emotion Guided Music Generation
3. Cheap Secure Terminal
4. Stellar Storm
5. Cards
6. Computer Motherboard Testing
7. Phone Assistant
8. Groups Real-Time Messaging System
9. ListView
10. Crusade
11. Kronos
12. Space Exploration Game
13. Matrix Spectrum
14. Drive Safe
15. Taster
16. Spektrum
17. Mouser

(b) Department of EERE (Electrical Engineering & Renewable Energy)

BS Electrical Engineering
1. Using Gaming to Sharpen Fine Motor Skills
2. A Web-Based Controller for a Float Tank System
3. An Embedded Loop Gain/Phase Measurement in a Digitally Controlled DCDC Converter
4. Smart Luggage Tag 2000 - Proof of Concept
5. Design, Development and Assessment of Spatial Light Modulator Filtering in the Fourier Plan

BS Electronics Engineering Technology
1. BikeSafe - The design and development of an app controlled LED turn signal bicycle vest
2. The Design, Development, and Construction of a Microphone Pre-Amplifier
3. A Study in Positive Feedback & Self-Oscillation
4. The Design, Development, and Implementation of a Keychain Locating Device
5. IoT Thermostat with Outdoor Environmental Monitoring and Controls
6. RF Power Measurement Using DC-Only Resources: An Engineering Test Solution

Highlighted project indicates an oral presentation.
7. Rain Powered Lighting and Mobile Device Charger  
8. Golf Club Swing Analyzer  
10. CNC Router Project  
11. The Powder Pumper - An Automated Powder Dispenser  
12. Olympus: A Micro-Volume Deposition Reactor  
13. A Scalable, Modular Panelboard Metering System  
14. Advanced LED Turn Signal Controller for Motorcycles

BS Renewable Energy Engineering
1. **24 kW Pilot PV System for the Confederated Tribes of the Umatilla Indian Reservation**
2. Design and construction of an electric drivetrain freeway capable commuter motorcycle
3. Modern AC Motor Control
4. Thermoelectric conversion system for electric power generation
5. Development of Swagelok-type Lithium-ion Battery Cells for Experimental Testing and Analysis
6. Induction Generator Concept for Low Power Energy Harvesting
7. Design of a Parabolic Trough and Condenser for an Autonomous Solar Thermal Water Distillation System
8. Conceptual Design of a renewable power system for remote communities in the developing world
9. Oregon Tech Laboratory Microgrid Control System Integration
10. Oregon Tech Laboratory Microgrid Non-Inertial Stochastic Generator Design
12. Energy Independence for Small Islands

MS Renewable Energy Engineering
1. Characterization of Titanium Carbide as Air Electrode Material in a Lithium Air Battery: Preliminary Findings
2. Operation and Energy Use Improvements in a Heating Water Distribution System
3. Campus Microgrid Feasibility Study, Design, and Implementation Plan
4. Water Startup Time Model Validation
5. Voltage Sag Support – Sizing Energy Storage and Modeling of Advanced Inverter Controls for PV Installations

(c) Department of MMET (Mechanical and Manufacturing Engineering & Technology)

BS Mechanical Engineering Technology
1. **Design and Build of a Large Scale Stirling Cycle Engine**

Highlighted project indicates an oral presentation.
(d) Department of MGT (Management)

BS Management: Information Technology
1. Summer Reading Program Registration Tool
2. Chen’s Order system
3. Encore Club Online Registration System
4. Expanding the NintendoAge.com Database
5. The Peoria connection
6. Automation Testing
7. Design, Development, and Implementation of a Network Monitoring System for Erickson Information Services
8. Remote Lab
9. Aloha Baptist Network
10. Understanding PACS through WIKI
11. Emergency Department Dashboard Upgrade
12. Oregon Tech’s Healthy Active Tracking System
13. K-12 Virtual Desktop Lab: Saving Districts Money, Time, and Effort through Converged Management
14. Implementation of a CRM solution for Mentors360
15. Oregon Dog Rescue Web Upgrade

Highlighted project indicates an oral presentation.
COLLEGE OF HEALTH, ARTS, AND SCIENCES

(a) Department of CLS (Clinical Lab Sciences)

BS Clinical Lab Sciences

1. Common North American Parasites: Characteristics, Detection, and Treatment
2. Platelet Function Analyzer (PFA-100): Clinical Applications and Testing Procedure
3. Membrane Protein Mutations in Red Blood Cells and the Diseases they Cause

(b) Department of EMS (Emergency Medical Services)

BS Emergency Medical Services

2. Closed Loop Communication
3. Critical Care Survey

Highlighted project indicates an oral presentation.
Highlighted project indicates an oral presentation.
# 4

**Project Title:** Stellar Storm  
**Student(s):** David Battagin

**Description:**  
3D video game to gain territory for your faction, fighting alongside your friends and allies against hostile enemies.

**Special Requirements:**  
None listed.

# 5

**Project Title:** Cards  
**Student(s):** Christopher Boese

**Description:**  
Multiplayer Card game for mobile devices, specifically targeting multiplayer pinochle for Android devices.

**Special Requirements:**  
None listed.

# 6

**Project Title:** Computer Motherboard Testing  
**Student(s):** Angela Bohan

**Description:**  
An Arduino "robot" to measure and test motherboards.

**Special Requirements:**  
None listed.

# 7

**Project Title:** Phone Assistant  
**Student(s):** Smahane Douyeb

**Description:**  
Android application to automatically manage one's phone settings

Highlighted project indicates an oral presentation.
Special Requirements:
None listed.

#8

Project Title: Groups Real-Time Messaging System
Student(s): Dustin Falgout

Description:
A highly efficient application providing low latency environment for sending messages of various media types, (i.e.: text, images, videos, etc.)

Special Requirements:
None listed.

#9

Project Title: ListView
Student(s): Joshua Hartwell

Description:
Website used for second-hand buying and selling of products, goods and services supporting video presentations.

Special Requirements:
None listed.

#10

Project Title: Crusade
Student(s): Patrick Jarofski

Description:
A fantasy trading card game playable on a client-server application. Supports 2 players over a network connection.

Special Requirements:
None listed.

Highlighted project indicates an oral presentation.
#11

**Project Title:** Kronos  
**Student(s):** Khanh Nguyen

**Description:**  
Framework for self-directing drones

**Special Requirements:**  
None listed.

#12

**Project Title:** Space Exploration Game  
**Student(s):** John Price

**Description:**  
A Unity3D game of space missions

**Special Requirements:**  
None listed.

#13

**Project Title:** Matrix Spectrum  
**Student(s):** Jeremie Ruvunangiza

**Description:**  
Android facial recognition system

**Special Requirements:**  
None listed.

#14

**Project Title:** Drive Safe  
**Student(s):** Nhan Tran

**Description:**  
Android application to track driving events and habits

**Special Requirements:**  
None listed.

Highlighted project indicates an oral presentation.
#15

**Project Title:** Taster  
**Student(s):** Christopher Ubick

**Description:**  
Allows a user to take pictures of what they tasted, write notes, rate what they tasted and share their notes with friends

**Special Requirements:**  
None listed.

#16

**Project Title:** Spektrum  
**Student(s):** Katherine Valentine

**Description:**  
A highly interactive Unity 2D game based on shooting colors

**Special Requirements:**  
None listed.

#17

**Project Title:** Mouser  
**Student(s):** Logan Wright

**Description:**  
A lightweight remote desktop application

**Special Requirements:**  
None listed.
Program: BS Electrical Engineering

# 1

**Project Title:** Using Gaming to Sharpen Fine Motor Skills  
**Student(s):** Michelle Kantor

**Description:**  
The BAN Assist uses haptic feedback in a gamified system to leverage muscle memory and sharpen fine motor skills. The applications for this gaming system include therapy augmentation for persons who've suffered from traumatic brain injury and children with motor-skill delay.

**Special Requirements:**  
One power outlet.

---

# 2  

**Project Title:** A Web-Based Controller for a Float Tank System  
**Student(s):** Jonathan Waldrip

**Description:**  
A float tank control system custom built to fit the needs of a local business. Features include Wi-Fi and Ethernet communication, installer-friendly power options, a web-based user interface, and local override controls with an LCD display.

**Special Requirements:**  
Table close to a power outlet.

---

# 3  

**Project Title:** An Embedded Loop Gain/Phase Measurement in a Digitally Controlled DCDC Converter  
**Student(s):** Gary Baker

**Description:**  
This paper presents a method and source code for creating an embedded control loop gain / phase analyzer function in a digitally controlled DCDC power converter. A target converter application is designed and presented with simulation and test results. The analyzer code is verified by simulation result and by comparison with measured loop gain / phase using a commercial instrumentation.

Highlighted project indicates an oral presentation.
Special Requirements:
Table close to a power outlet.

# 4

Project Title: Smart Luggage Tag 2000 - Proof of Concept
Student(s): Galen McDermed

Description:
A proof of concept of the practicality of a smart luggage tag. The project uses SMS messaging from a cell phone to request GPS coordinates from the unit. An alarm can also be activated and deactivated via SMS. The project explores the feasibility of implementing a small luggage tag to any piece of luggage for tracking lost luggage.

Special Requirements:
One power outlet.

# 5

Project Title: Design, Development and Assessment of Spatial Light Modulator Filtering in the Fourier Plan
Student(s): Robert Kaiser

Description:
A phase altering spatial light modulator is used to apply a random binary mask in the Fourier plane of a microscope-based optical system. The inverse of the binary matrix to the spatial light modulator capturing both images with a digital camera. The two images using MATLAB to produce an optically filtered image of the sample being magnified.

Special Requirements:
None listed.
Program: BS Electronics Engineering Technology

# 1

**Project Title:** BikeSafe - The design and development of an app controlled LED turn signal bicycle vest  
**Student(s):** Nate Tan

**Description:**  
Portland is known for being one of the most bike friendly cities in the United States. This vest is bridging the gap between motorist and bicyclist. This LED bike vest has turn signals that will alert on coming motorist of the user intention. The user controls the vest wirelessly through Bluetooth from an Android application off of their phone.

**Special Requirements:**  
None Listed.

# 2

**Project Title:** The Design, Development, and Construction of a Microphone Pre-Amplifier  
**Student(s):** Gregory P. Simon

**Description:**  
There are many options on the market for microphone pre-amplifiers, ranging from very cheap to very expensive. This project focuses on achieving good sound and +70dB of gain or better at a medium price point that has better quality than the cheaper offerings yet is not prohibitively expensive, nor very cheaply made with poor quality and poor sound like some of the most common offerings today. It uses innovative design with multiple feedback techniques and careful attention to quality parts choices to meet the required parameters.

**Special Requirements:**  
Power strip with at least seven plugs available. A table or bench with enough space to set up the computer monitor (with the computer below), the small rack with the mixer in it, the sig-gen, and oscilloscope, and the preamp itself.

# 3

**Project Title:** A Study in Positive Feedback & Self-Oscillation  
**Student(s):** Jacob Skrydlak

**Description:**  
Guitars have always been played by plucking the strings. This project aimed to change this by driving those strings into self-oscillation, through the use of positive feedback. This effect

Highlighted project indicates an oral presentation.
would allow guitarists to mimic/simulate the use of a bowed string instrument, with little to no experience using one.

**Special Requirements:**
Access to an AC power outlet.

---

**# 4**

**Project Title:** The Design, Development, and Implementation of a Keychain Locating Device  
**Student(s):** Ashley Wilcox

**Description:**  
The project is a system of devices that allows users to find their lost items, using a smartphone or computer, from medium to close distances.

**Special Requirements:**  
Access to an AC power outlet.

---

**# 5**

**Project Title:** IoT Thermostat with Outdoor Environmental Monitoring and Controls  
**Student(s):** Mark Chernishoff

**Description:**  
This project is a thermostat connected to the internet and is connected to an external temperature/humidity sensor via Bluetooth. The indoor and outdoor temperature can be visible on the touchscreen or on a webpage. The outdoor temperature and humidity is also logged in a database and the information can be retrieved on the webpage.

**Special Requirements:**  
None listed.

---

**# 6**

**Project Title:** RF Power Measurement Using DC-Only Resources: An Engineering Test Solution  
**Student(s):** Jeremy Cooper

**Description:**  
The DC-only RF power measurement method that I investigated was to calculate the power measurement of "device under test" (DUT) so that a VCO's Pout can be measured over a range of ±10dBm by comparing the output voltage of a detector to its input power. This method uses a power meter during initial setup and calibration to measure a swept power input into the detector. The voltage out of the detector is used to find a linear calibration equation.

Highlighted project indicates an oral presentation.
During testing of the DUT, the output voltage of the power detector is used with the linear calibration equation to back calculate the power received by the detector. After the input power was calculated, the program will then subtract the test board's attenuation to arrive to the final result of the RF power output of the DUT.

**Special Requirements:**
None listed.

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**# 7**

**Project Title:** Rain Powered Lighting and Mobile Device Charger  
**Student(s):** Nathan Arp

**Description:**  
This project includes a rooftop rainfall catch system, a pico hydro generator, four 220 lumen LED Lights, a mobile device charger, and operating controls.

**Special Requirements:**  
The display will an outlet and about two square feet of additional space for the model.

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**# 8**

**Project Title:** Golf Club Swing Analyzer  
**Student(s):** Anthony Burroughs

**Description:**  
A golf club with inertial measurement sensors that collects data from club head during swing and displays it on remote PC for swing analysis and training aid.

**Special Requirements:**  
None listed.

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**# 9**

**Project Title:** Sensorion: The Evolution of Home Security  
**Student(s):** Cody Dunlop

**Description:**  
Sensorion is a wireless home security system with future expansion into the home automation market. Using modern Bluetooth 4.0 Low Energy technology and cloud service integration, the Sensorion system brings home safety and control into the modern age.

**Special Requirements:**  
Two power outlets, Ethernet connection for Internet access.

Highlighted project indicates an oral presentation.
# 10

**Project Title:** CNC Router Project  
**Student(s):** Davie Ruonavaara

**Description:**  
My CNC Router reads a gcode file from a computer, interprets the command, and executes the command. The controller I’m using is an Arduino Uno and the gcode sender is a Python program. The cutting head is a small handheld wood router that can cut wood, plastic, and even aluminum. The cutting area is approximately 2’ by 3’ with 5” of travel in the z direction. The whole unit weighs around 120 lbs.

**Special Requirements:**  
None listed.

# 11

**Project Title:** The Powder Pumper - An Automated Powder Dispenser  
**Student(s):** David Steeprow

**Description:**  
The Powder Pumper is an ARM Microcontroller based system that is designed to accurately and consistently dispense a specific amount of powder into a container.

**Special Requirements:**  
Two AC power outlets.

# 12

**Project Title:** Olympus: A Micro-Volume Deposition Reactor  
**Student(s):** Vincent Wilson

**Description:**  
A safety chamber that will allow for rapid and flexible screening of chemical precursors to be used in the cutting edge technology of Atomic Layer deposition. The project will employ analog, digital, mechanical and electro-mechanical components working together to provide a safe environment. All hardware will be software controlled and monitored by the use of a programmable logic controller.

**Special Requirements:**  
None listed.
### # 13

**Project Title:** A Scalable, Modular Panelboard Metering System  
**Student(s):** Anthony Wright

**Description:**
In recent years, energy conservation has become a major focus in new construction and renovation alike. In response to this movement, and with the popularity of “green building” certifications such as LEED, there is an increasing demand for fine-grained energy metering systems for tracking and analyzing electrical energy consumption. This modular panelboard metering system is an easy to install and economical solution for monitoring electrical energy usage down to the specific room, office, or even individual piece of equipment or appliance. By providing energy trending and real-time data over a Web-based interface, a user will be able to focus on energy conservation where it matters.

**Special Requirements:**
A single power outlet.

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### # 14

**Project Title:** Advanced LED Turn Signal Controller for Motorcycles  
**Student(s):** David Rawlings

**Description:**
Low cost aftermarket turn signal controller using a microcontroller and a motion processor unit (MPU). The unit uses a PWM signal to operate the turn signal and brake lights that are normally off to create more light on the bike. A brake light flash option switch is integrated into the unit that allows the user to select the feature. When selected, the brake lights will flash quickly 3 times when the brake pedal is pressed. The extra light and flashing brake option add a measure of safety. Turn signal cancel features are integrated via the MPU - at a certain lean angle the turn signals will auto cancel. Additionally, should the lean angle not be attained such as when changing lanes, a timer auto cancels the signals after a programmable time. Considerable power savings is achieved with this unit that lessens demand on charging components, extending their useful life, and saving the user time and money.

**Special Requirements:**
Space for a motorcycle

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Highlighted project indicates an oral presentation.
Program: BS Renewable Energy Engineering

# 1

Project Title: **24 kW Pilot PV System for the Confederated Tribes of the Umatilla Indian Reservation**

Student(s): Kevin Vuong, Joshua Powers, and Mark Messina

Description:
This project includes the design of a 24 kW PV system placed on a carport in the parking lot of the Department of Science and Engineering (DOSE) field office located within the Umatilla Indian Reservation (CTUIR). Highlights of the project include interaction with employees and members of the CTUIR on a client-like basis, AutoCAD electrical design, EasyPower modeling, and an approximated budget and bill of materials. The project will be the first of its kind for the reservation and will set the standards and expectations for possible future projects. It will also partially alleviate the burden of energy costs for the DOSE field office (which is the first its kind) and focuses on a myriad of environmental issues.

Special Requirements:
None listed.

# 2

Project Title: Design and construction of an electric drivetrain freeway capable commuter motorcycle

Student(s): Charles Jost

Description:
This project is to engineer an electric motorcycle with performance comparable to the Brammo Inertia motorcycle, but at a lower cost. The motorcycle includes a high power-density electric motor, shaft-drive fixed-gear reduction, permanent magnet stator field, copper wound armature coils, 16 point mechanical rectifier, potentiometer throttle, forced-air cooling, hydraulic brakes and an air-ride suspension. The motorcycle has achieved higher speeds, over twice the propulsion power, and more KWH's at a fraction of the cost. The bike is currently awaiting modifications to make it street legal and an on-board portable charging system.

Special Requirements:
Space for the motorcycle

# 3

Project Title: Modern AC Motor Control

Student(s): Greg Stephens

Description:

Highlighted project indicates an oral presentation.
Design and implement a Variable Frequency Drive (VFD) with LCD touchscreen interface.

Special Requirements:
None listed.

# 4

Project Title: Thermoelectric conversion system for electric power generation  
Student(s): Reuben Jones

Description:
System to convert thermal energy into electrical energy, by using thermoelectric generators.

Special Requirements:
Hot plate will be in use

# 5

Project Title: Development of Swagelok-type Lithium-ion Battery Cells for Experimental Testing and Analysis  
Student(s): Christopher Lee

Description:
The project will address the development of a procedure to assemble Swagelok-type lithium-ion battery half cells. The procedure will cover the safety, calculations, assembly, testing and evaluation factors associated with battery research and development. The purpose of the project will be to educate students on the various techniques and equipment involved with assembling and testing of the Swagelok-type half cells.

Special Requirements:
None listed.

# 6

Project Title: Induction Generator Concept for Low Power Energy Harvesting  
Student(s): Adam Zbinden

Description:
A passive electromechanical energy harvesting device that is used to experimentally determine the relationship between velocity and induced potential-based on acceleration and voltage data-for a linear permanent magnet generator.

Special Requirements:
None listed.

Highlighted project indicates an oral presentation.
# 7

**Project Title:** Design of a Parabolic Trough and Condenser for an Autonomous Solar Thermal Water Distillation System  
**Student(s):** Ben Ferkinhoff

**Description:**
The project will include the theoretical design of a solar thermal parabolic trough that will vaporize water, the steam travels through a condenser where it is condensed into potable water. The design will be modular so that it can be easily scaled to meet the needs of any village however the specific design is based on the village of Ludewa in Tanzania. The focus of the design process is to satisfy the water consumption needs for the village using an autonomous system in the most cost effective manner.

**Special Requirements:**

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# 8

**Project Title:** Conceptual Design of a renewable power system for remote communities in the developing world  
**Student(s):** David Silver

**Description:**
This project is to design a system specifically to fit into niches of plentiful renewable power and lack of an electrical grid. By designing the system backbone to connect loads to generation of whatever type then individual projects can be completed and adapted to fit the community in the future. Even though most off-grid projects are highly customized to meet a desired level of self-sufficiency, it will be more important for all connected projects to be standardized on as many levels as possible so each can be individual but then be integrated into the community project

**Special Requirements:**
120V plug in for light

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# 9

**Project Title:** Oregon Tech Laboratory Microgrid Control System Integration  
**Student(s):** Spencer Cooley

**Description:**
This project consists of programming the industrial Human-Machine Interface (HMI) and the Programmable Automation Controller (PAC) to control the motor/generator sets and the

Highlighted project indicates an oral presentation.
system configuration for the power laboratory microgrid at the Oregon Tech – Wilsonville campus.

**Special Requirements:**
None listed.

# 10

**Project Title:** Oregon Tech Laboratory Microgrid Non-Inertial Stochastic Generator Design  
**Student(s):** Lisa Pitkin

**Description:**  
This project consists of designing and integrating a non-inertial stochastic generator into the power laboratory microgrid at the Oregon Tech – Wilsonville campus. The design contains a programmable dc power supply that can mimic the behavior of a photovoltaic array and a grid-tied inverter.

**Special Requirements:**
None listed.

# 11

**Project Title:** Voltage Sag Support – Sizing Energy Storage and Modeling of Advanced Inverter Controls for PV Installations  
**Student(s):** Taylor Redding and Andrew Hill

**Description:**  
This project was inspired through the NW Energy XP Award and involves a multidisciplinary, multi-institutional team consisting of EE and REE undergraduate and graduate students from Oregon Tech and WSU. The project focused within the areas of electric power and control systems on utility grid challenges with increasing penetration levels of PV systems. The project had two primary objectives. The first was to determine a minimum energy storage per unit inverter capacity that may be included within advanced inverter technology to aid with voltage sag support functions. The second objective involved developing a model to simulate an advanced inverter providing voltage support through a sag event.

**Special Requirements:**
None listed.

# 12

**Project Title:** Energy Independence for Small Islands  
**Student(s):** Trevor Rogers

Highlighted project indicates an oral presentation.
Description:

Special Requirements: None listed.
Program: MS Renewable Energy Engineering

# 1

Project Title: Characterization of Titanium Carbide as Air Electrode Material in a Lithium Air Battery: Preliminary Findings
Student(s): Christian Diaz

Description:
In this project various electrochemical techniques will be used to study the primary and side reactions in a lithium/air cell using titanium carbide as an air electrode material. Highlights of the background and methodology are presented, focusing on characteristics studied and experimental techniques. Preliminary results may also be presented if available.

Special Requirements:
None Listed.

# 2

Project Title: Operation and Energy Use Improvements in a Heating Water Distribution System
Student(s): Mia Yang

Description:
This design and sustaining engineering project analyzed a heating water distribution system at the Portland International Airport and modified mechanical and control systems to improve process operation and reduce energy consumption.

Special Requirements:
None listed.

# 3

Project Title: Campus Microgrid Feasibility Study, Design, and Implementation Plan
Student(s): Laura Polk

Description: This project analyzed the 12.47 kV electrical distribution system on the Klamath Falls campus and investigated the feasibility of creating an islanding microgrid for the campus using the existing 2 MW photovoltaic array and the 2 MW geothermal power plant. Various design concepts were explored, and an implementation plan was developed following NREL’s CORE systems-based design approach.

Special Requirements:
None listed.

Highlighted project indicates an oral presentation.
# 4

**Project Title:** Water Startup Time Model Validation  
**Student(s):** Daniel Lee

**Description:**

**Special Requirements:**
None Listed.

# 5

**Project Title:** Voltage Sag Support – Sizing Energy Storage and Modeling of Advanced Inverter Controls for PV Installations  
**Student(s):** Umid Mamadaminov

**Description:**
This project was inspired through the NW Energy XP Award and involves a multidisciplinary, multi-institutional team consisting of EE and REE undergraduate and graduate students from Oregon Tech and WSU. The project focused within the areas of electric power and control systems on utility grid challenges with increasing penetration levels of PV systems. The project had two primary objectives. The first was to determine a minimum energy storage per unit inverter capacity that may be included within advanced inverter technology to aid with voltage sag support functions. The second objective involved developing a model to simulate an advanced inverter providing voltage support through a sag event.

**Special Requirements:**
None listed.

Highlighted project indicates an oral presentation.
Program: BS Mechanical Engineering Technology

# 1

**Project Title:** Design and Build of a Large Scale Stirling Cycle Engine  
**Student(s):** Brandon Clarno

**Description:**  
This the design and build of a large scale alpha configuration Stirling engine. The goal for my project is to manufacture a zero foot print heat engine. Stirling engines operate on a closed loop system, so the working fluid never leaves the engine and thus no waste product is create. A Stirling engine can be very efficient at converting thermal energy of any kind into mechanical work. Mechanical work can be used in many applications from pumping water from a well to turning a generator to create electricity.

**Special Requirements:**  
None listed.
Management: Information Systems
2015 Student Project Symposium Entries

Program: BS Management: Information Systems

# 1

Project Title: Summer Reading Program Registration Tool
Student(s): Thuy Nguyen

Description:
The Summer Reading Program Registration Tool is a Web-based registration tool that allows parents and Library Service Desk employees to register children for the Summer Reading Program hosted by the Hillsboro Public Library. The tool will also allow Service Desk Employees to update reading activities and retrieve reports for internal use.

Special Requirements:
None listed.

# 2

Project Title: Chen’s Order system
Student(s): Li Tan

Description:
This is an order fulfillment system for a small Chinese restaurant designed to service online orders and pick-up

Special Requirements:
None listed.

# 3

Project Title: Encore Club Online Registration System
Student(s): Minh Quan

Description:
The purpose of this project is to create an online registration system for Encore Poker Club to allow customers to register for their tournament selections. The system allows a customer to register their information, select the tournament that they would like to participate in and pay for this service. PayPal is used for the form of payment. Once payment is received, the payment information is stored in the database. Staff at the club will be able to retrieve this information on SQL Server and enter it into their tournament director software.

Special Requirements:

Highlighted project indicates an oral presentation.
# 4

**Project Title:** Expanding the NintendoAge.com Database  
**Student(s):** Alexander Case

**Description:**  
An expansion of the NintendoAge.com database to incorporate data from Nintendo Power Magazine's "Power Poll" to provide more objective data on the contemporary popularity of titles for the Nintendo Entertainment System (NES), Super Nintendo Entertainment System (SNES) and Game Boy (GB).

**Special Requirements:**  
None listed.

# 5

**Project Title:** The Peoria connection  
**Student(s):** Tim Knighten

**Description:**  
The project is to deploy a social media platform specifically for the Peoria Tribe of Indians of Oklahoma and its non-reservation members. The primary goal of this platform is to establish a better and more direct communication between all Peoria Tribal members with consideration to each members' privacy.

**Special Requirements:**  
None Listed.

# 6

**Project Title:** Automation Testing  
**Student(s):** Zeid Rizvic

**Description:**  
The purpose of this project is to ensure successful regression testing of the web portals by using automation on all future releases for the LifeMap team.

**Special Requirements:**  
None listed.

Highlighted project indicates an oral presentation.
# 7

**Project Title:** Design, Development, and Implementation of a Network Monitoring System for Erickson Information Services  
**Student(s):** Scott Adams

**Description:**  
Erickson Information Services has a large geographical network with many devices. Erickson Information Services is concerned about their response time to network issues and would like a way for their network to be automatically monitored and for them to receive alerts when issues arise. This project explores several solutions to monitor Erickson Information Services’ network and will implement a solution to Erickson Information Services liking.

**Special Requirements:**  
Two outlets and room for a laptop and monitor. Network Access

# 8

**Project Title:** Remote Lab  
**Student(s):** Michael Bates

**Description:**  
Create a computer lab for students to access remotely, from any computer with a Remote Desktop Client.

**Special Requirements:**  
Two outlets and room for a laptop and monitor. Network Access

# 9

**Project Title:** Aloha Baptist Network  
**Student(s):** Charles Bui and Tony Wirth

**Description:**  
Aloha Baptist church needed a system that can help centralize and consolidate a network to allow more accessibility to the end user, and the two other groups that attend the church. The beneficiary’s and stakeholders of this project are consisted of the users of this system including: the head pastor, the leadership team, the younger generation (youth and young adults) and future guests of the church. This will also be accessible to the faculty and staff that lead the two other denominations held at this church.

**Special Requirements:**  
None listed.

Highlighted project indicates an oral presentation.
# 10

**Project Title:** Understanding PACS through WIKI  
**Student(s):** Jennifer Marrs

**Description:**
The goal of this senior project is to increase usability through the PACS system by increasing workflow and accessibility. This project will help and guide my peers (teachers and students) by providing a procedure manual of the PACS system at Oregon Tech Klamath Falls campus. My project has taken the manual form to the next level by using WIKI through a free educational site. The site will help facilitate instructions, and learning through a self-paced class format style. This site will cover cleaning up the PACS system, creating folders, defining access, help with important CT and MRI images and reports, and User roles.

**Special Requirements:**
None listed.

# 11

**Project Title:** Emergency Department Dashboard Upgrade  
**Student(s):** Alexandra Mihaljevic

**Description:**
Kaiser Permanente Sunnyside and Westside Medical Center's emergency department dashboards have been redesigned and updated to best reflect work practices and ED staff business needs. Redesign includes the front-end interface and the back-end data-retrieval structure. The dashboards include key data, metrics, and goals within an easy-to-read user interface that provides an at-a-glance review of high-level summarized data specific to each emergency department.

**Special Requirements:**
Not to place project poster within a corner area.

# 12

**Project Title:** Oregon Tech’s Healthy Active Tracking System  
**Student(s):** Amber Newcomb

**Description:**
Overview/Objectives: I will explain what the healthy active challenge is, what the problem was, why my tracking system is the solution, and key project details. Software: I will go over the software I had to use as well as the languages that I was required to use (ASP.net, SQL, and C #). Implementation: Explain when and how the system will be up and running through OIT. Next Phase: Where the system can be expanded in time for both campuses. Conclusion Acknowledgements: For stakeholders and additional persons who assisted me.

Highlighted project indicates an oral presentation.
Special Requirements:
None listed.

# 13

Project Title: K-12 Virtual Desktop Lab: Saving Districts Money, Time, and Effort through Converged Management
Student(s): Aaron Sackett

Description:
Implemented a pilot program to test Virtual Desktop Infrastructure (VDI) technology for use in a K-12 computer lab.

Special Requirements:
Two outlets and room for a laptop and monitor. Network Access

# 14

Project Title: Implementation of a CRM solution for Mentors360
Student(s): Gregory Sherwood

Description:

Special Requirements:
None listed.

# 15

Project Title: Oregon Dog Rescue Web Upgrade
Student(s): Brett Suydam

Description:
Developed a new website with enhanced functionality for Oregon Dog Rescue

Special Requirements:
None listed.
Clinical Lab Sciences
2015 Student Project Symposium Entries

Program: BS Clinical Lab Sciences

# 1

Project Title: Common North American Parasites: Characteristics, Detection, and Treatment

Student(s): Emily Stair

Description:
Description of common North American parasites and the symptoms they present in infected individuals. Laboratory procedures to test for parasites. Treatments for parasitic infestations.

Special Requirements:
None listed.

# 2

Project Title: Platelet Function Analyzer (PFA-100): Clinical Applications and Testing Procedure

Student(s): Katherine Baxter

Description:
Brief outline of the function and importance of homeostatic platelet levels in the blood. Description of common platelet disorders such as Von Willebrand disease and those caused by aspirin and other anti-inflammatory drugs. Overview of the PFA-100, a machine used to identify these disorders. Explanation of how a professional would interpret results and proceed with treatment.

Special Requirements:
None listed.

# 3

Project Title: Membrane Protein Mutations in Red Blood Cells and the Diseases they Cause

Student(s): Cami Hashimoto

Description:

Highlighted project indicates an oral presentation.
The project will focus on three diseases: Hereditary Spherocytosis, Hereditary Elliptocytosis, and Hereditary Pyropoikilocytosis. These diseases all result from mutations in the membranes of red blood cells. I plan to have pictures of the mutations in the membranes of the red blood cells causing each disease as well as text explaining what the mutation is and what it does. I also plan to have a case study for each disease so that I can explain symptoms and treatment.

**Special Requirements:**
None listed.
Project Title: D50 vs. D10: A Review of EMS Protocols for Hypertonic Dextrose
Student(s): Kristian Adair, Micah Fillinger, Ryan Palmberg, Amy Quinn, and Jonathan Ripley.

Description:
For decades, EMS agencies across the country have used a medication called dextrose to treat hypoglycemia (low blood sugar) in people of all ages in the emergency setting. When a patient’s blood sugar drops to dangerously low levels, the patient experiences an altered level of consciousness, exhibiting signs of confusion, disorientation, or strange behavior. In some cases, the individual can be completely unresponsive. If a patient is in a state where they can safely eat or drink, consuming a sugary food or drink will raise the blood sugar naturally. However, many patients in this condition cannot safely swallow food or drink without the risk or choking. In these instances, dextrose is administered intravenously to raise the blood sugar to a level that allows their brain to regain normal function. There are several concentrations of dextrose that are used in the field today. The most prevalent is a solution composed of fifty percent dextrose (D50), and a less commonly used ten percent dextrose solution (D10).

Administering D50 intravenously carries several risks. If the dextrose escapes out of the vein when being administered, tissue death in the area around the infusion site can occur. Nausea and vomiting are possible side effects if the solution is given too quickly, and medication dosage errors can occur when diluting D50 for pediatric patients. Research and field experience have shown that D10, while a significantly lower concentration of dextrose, still provides an ample amount of dextrose to raise blood sugar back to normal levels. However, it is safer, less expensive, carries a lower risk of the aforementioned side effects, but is just as effective as D50. The goal of our project was to analyze EMS agencies across the United States and determine how many were using D50, how many were using D10, and the rationale for why they chose one concentration of dextrose over another.

The research group collected and reviewed 185 protocols from EMS agencies across the country, including those from the 50 most populated cities. This project will report on the results from our protocol analysis as well as allude to the follow-up survey work in the next phase. The next phase of this project involves sending an electronic survey to the medical directors who manage the protocols used in our study. The survey will investigate the reasons why so many agencies are still using D50, as well as why some agencies have made the switch to D10. Some explanations for this may include past practice, cost or availability issues, and medical director preference. The results from the survey portion of our project are upcoming.

Special Requirements:
None Listed.
Project Title: Closed Loop Communication  
Student(s): Amy Eskeldson, Matt Johnson, Matt Gervasi, and Alec Leetch

Description:  
The communication Scoring tool was a project that was initially started by a Group of students in last year’s Paramedic Class. The intention of this project was to come up with a scoring tool to evaluate closed loop communication (CLC) in high fidelity simulation training. We hoped to determine whether or not Crisis Resource Management (CRM) curriculum, coupled with high fidelity simulation training, improved CLC practices during the on-scene management of a 911 call.

In order to evaluate the efficacy of training and of the tool, Simulations were recorded using GoPro cameras and audio enhancing equipment. In order to properly evaluate the tool, and the training, two Paramedic education programs were used. The students in the OIT/OHSU Program having had the ongoing CRM curriculum and high fidelity simulation training were recorded throughout simulations scheduled weekly throughout the term. The Portland Community College (PCC) paramedic students where then run through the same simulation at what was determined to be the same point in there paramedic training, recorded, and used as a control group to determine whether or not CRM and high fidelity simulation training were effective in improving CLC.

Once the Simulations have been recorded the videos will be randomized and sent to blinded graders identified as subject matter experts familiar with CLC. These Graders will sit in a short seminar prior to grading of the recorded content to educate them on the proper usage of the tool. If at that point the grading is shown to be consistent the Graders will evaluate the content using the tool and return the result to the Research Group for final analyses.

The Goal of the group is to present this project at the symposium as well as potentially publish the research. All persons involved and all data collected were done so in concordance with the IRB approval.

Special Requirements:  
None listed.

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# 3

Project Title: Critical Care Survey  
Student(s): Paul Zapp-Albin, Brenna White, Daniel Teater and Sarah Lamb

Description:  
Continuing the work of the Paramedic class of 2014, our project started with collecting the data from the survey written and sent out by the 2014 class. The survey was based on a major national study that showed what many paramedics already believed; the advanced skills...
required for critical care patient transportation between facilities are poorly regulated, rarely taught in school and completely lacking in any national or regional certification. Our survey aimed to find out how Oregon compared to the country as a whole and what areas could be most improved. Upon analysis of our data and further research into critical care transport across the country and the world, we will be writing a proposal for an official Oregon Critical Care Certification. This proposal will address the need for such training, outline key skills and recommend an educational format for the certification.

**Special Requirements:**
None listed.