

CETT 1321 – Electronic Fabrication

CRN 27598 – Fall 2020

Dates: 08/24/2020 - 12/13/2020

Northwest College| Lab-based

Intermediate Level Course

Instructor contact Information and Preferred Method of Contact	Name: Khansaa Almansor Email: khansaa.almansor1@hccs.edu Tel.: 713-718-2131 Office: 555 Community College Dr., Houston TX 77013, Science Tech Building, RM 100 <i>It is preferred to contact through email.</i>
Office Location and Hours	Office hours: Check my learning web here . Office location: Office: 555 Community College Dr., Houston TX 77013, Science Tech Building, Room 100 Office location and hours Please feel free to contact me concerning any problems that you are experiencing in this course. You do not need to wait until you have received a poor grade before asking for my assistance. Your performance in my class is very important to me. You can expect to get a response from me during instructor’s office hours. I am available to hear your concerns and to discuss course topics but not during the class time. So please set appointment by email and come to my office if necessary and I would be more than happy to discuss your concerns.
Course Location/Times	Northwest College: Alief - Hayes Campus , Room B224 Sa 8:00AM - 10:50AM Please be notified that class will be held virtually online through Canvas until the 1st of October.
Course Semester Credit Hours (SCH) (lecture, lab) If applicable	Credit Hours: 3.0 Lecture Hours 2.0 Weekly: Lab Hours Weekly: 4.0
Total Course Contact Hours	96
Course Length (number of weeks)	16
Type of Instruction	Lab-based, +48 Hrs Electronic Instruction

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Course Description (ACGM)	A study of electronic circuit fabrication techniques including printed circuit boards, wire wrapping, bread boarding, and various soldering techniques.
Course Prerequisite(s)	MATH 0312 or Department Approval.
CETT Program Objective/Goal	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Be well educated in the basic principles of their discipline, including the ability to analyze systems, interpret data, and present results. • Possess the state of the art knowledge in the discipline, including the ability to design and conduct experiments. • Demonstrate strong communication skills, able to work in teams, and understand professional and ethical responsibility. • Be knowledgeable of current Technologies and recognize the need to engage in a lifelong learning. • Be able to integrate mathematics, science, humanities, and social sciences into their primary work. • Manage time, and take pride in professional quality of work
Course Student Learning Outcomes (SLOs):	<p>The student will be able to:</p> <ul style="list-style-type: none"> • Apply electronic circuit fabrication techniques to industry standards; • Document step by step procedures; • Create schematic/wiring diagrams; • Apply circuit description; • Identify the tools required to produce a printed circuit board; and • Produce soldering connections.
Learning Objectives	<p>Students will:</p> <ol style="list-style-type: none"> 1. Apply electronic fabrication techniques to industry standards. <ol style="list-style-type: none"> 1.1 Apply the engineering and industry standards in electronic fabrication. 2. Document step by step procedures. <ol style="list-style-type: none"> 2.1 Apply technical writing standards to write different kind of technical reports. 2.2 Collect technical data and information using any internet search engine and finding solid sources and references. 2.3 Use MS Word computer application to type technical reports. 3. Produce soldering connections. <ol style="list-style-type: none"> 3.1 Recognize soldering kits, tools and techniques to produce good solder connections. 3.2 Apply soldering standards and specifications to solder through hole components. 3.3 Use industry standards of soldering terminals to terminate wires with cup-soldering terminals.

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	<p>4. Apply circuit description. 4.1 Describe simple electronic circuit. 4.2 Use MultiSIM computer application to simulate simple Electrical /Electronic circuits. 4.3 Apply Ohm’s law principles to calculate data of basic electronic circuits and to create graphs using MS Excel computer application. 4.4 Build simple electronic circuits on breadboard.</p> <p>5. Create schematic/wiring diagrams. 5.1 Use MS Visio computer application to create schematics and wiring diagrams of different electronic circuits.</p> <p>6. Identify the tools required to produce a printed circuit board. 6.1 Build a printed circuit on clad copper board.</p>	
<p>Course Calendar</p>	<p>CETT 1321 – Electronic Fabrication 16 Week Calendar / Regular Start / Tentative Calendar</p>	
	WEEK	<p>AGENDA / ASSIGNMENTS Assignments are due by dates indicated unless prior approval has been obtained.</p>
	1	<p>Electronic Fabrication Overview</p> <ul style="list-style-type: none"> • What is Electronic Fabrication? • What do you need to build an electronic circuit? • Internet websites exploring and searching. <p>Assignments/Quizzes</p> <ul style="list-style-type: none"> • Complete Syllabus online quiz and students Bios discussion.
	2	<p>Technical Writing</p> <ul style="list-style-type: none"> • Understand technical writing concepts. • Learn how to create a technical report. • Learn how to use MS Word to create a report. <p>Assignments/Quizzes</p> <ul style="list-style-type: none"> • Write a report that explains technical writing according engineering standards.
	3-5	<p>Soldering techniques</p> <ul style="list-style-type: none"> • Understand fundamentals of soldering, soldering tools and materials, and soldering standards and specifications. • Perform splicing and stripping of wires. • Learn the concepts of soldering terminals. <p>Assignments/Quizzes</p> <ul style="list-style-type: none"> • De-solder through hole components. • Apply the soldering industry standards to solder through hole components.

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		<ul style="list-style-type: none"> Apply the soldering industry standards to terminate 22 AWG wire with cup terminals. Write technical report explains soldering techniques, tools and materials, and industry soldering standards and specifications.
	6	<p>Midterm project (Soldering)</p> <ul style="list-style-type: none"> Apply your knowledge in soldering to assemble an electronic soldering circuit kit. Create technical report explains the project.
	7-15	<p>Electronic circuit description and concepts</p> <ul style="list-style-type: none"> Describe electronic circuit basic concepts: Voltage, Current, Resistance, circuit connections, and Ohm’s law. Simulate electronic circuits using the computer application, Multisim. Calculate basic electronic circuits’ data using MS Excel. Create graphs of any circuit data. Build a basic electronic circuit on breadboard. Draw schematics and wiring diagrams of electronic circuits using MS Visio. <p>Assignments/Quizzes</p> <ul style="list-style-type: none"> Calculate basic electronic circuit data using Ohm’s law. Simulate different type of electronic circuits using Multisim. Use Excel to calculate data of a basic circuit and create graphs relate to the data. Build simple electronic circuits on breadboard. Measure current and voltage values of the circuits. Create a schematic and the wiring diagram of a basic electronic circuit using MS Visio application. Write a technical report explains Ohm’s law lab that includes all the concepts of simulation, calculation, creating graphs, bread boarding, and drawing schematics and wiring diagrams.
	16	<p>Final term project (PCB)</p> <ul style="list-style-type: none"> Apply the steps of procedure to build a simple electronic circuit on clad copper board as a PCB. Use the right tools and materials to build PCB electronic circuit from scratch. Create technical report explains the project.
	<p>This calendar may change; any updates will be posted in Learning web or/and Canvas online. You are responsible for obtaining and reading any updated course calendars.</p> <p>Semester holidays and breaks: Labor Day Monday, September 7, 2020, Thanksgiving Break Thursday, November 26 – Sunday, November 29, 2020.</p>	
Instructional Methods	<p>CETT 1321 is a required course for all electronic engineering technology program AAS specializations and certificates.</p> <p>As an instructor, I want my students to be successful. I feel that it is my</p>	

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	<p>responsibility to provide you with knowledge concerning the field of electronics engineering technology, learning industry standards to apply in future jobs, and organizing and monitoring the field experience that allows you to connect the information that you learn in this course to the real world of engineering technology.</p> <p>As a student wanting to learn about the field of electronics, it is your responsibility to follow the instructions, submit assignments on the due dates, have all the required tools and materials, create midterm and final term projects, participate in classroom activities, attend class, and enjoy yourself while experiencing the real world of electronic engineering technology.</p> <p>As I believe that engaging the students in the learning is essential for teaching to be effective, you will spend the majority of class time involved in collaborative activities. You will be involved in discussions with your classmates and your instructor. As you will want to contribute to these discussions, you will need to come to class prepared to discuss, analyze and evaluate information from course materials, videos, and/or power point online presentations. However, practicing and discussions engagement is essential.</p>
<p>Student Assignments</p>	<p>Assignments have been developed to enhance your learning. To better understand a topic, you will be given assignments on key information that you will need to remember for your success in your career as a technician. Students will be required to successfully complete the following:</p> <p>Hands on and Computer based assignments:</p> <ol style="list-style-type: none"> 1- De-soldering, (Hands on assignment). 2- Soldering through hole components, (Hands on assignment). 3- Soldering cup terminals, (Hands on assignment). 4- Simulating an electronic circuit, (Computer based (MultiSIM) assignment). 5- Ohm's law calculations (assignment). 6- Electronic circuit data calculations (Computer based (Excel) assignment). 7- Creating graphs, (Computer based (Excel) assignment). 8- Drawing a Schematic and wiring diagram of an electronic circuit, (Computer based (Visio) assignment). 9- Crimping close barrel terminal, (Hands on assignment). <p>Technical Reports assignments:</p> <ol style="list-style-type: none"> 1- Engineering and Industry Standards, 2- Soldering Technical report,

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	<p>3- Ohm's Law technical report (Includes: Simulation, Calculations and graphs, Bread boarding and measurements, and Drawing schematics),</p> <p>Midterm Soldering and Assembling Project: Assemble a soldering circuit kit. The soldering circuit kit comes with a printed circuit board and certain amount of electronic components. Students should choose the circuit kit that includes minimum 15 electronic components, wires, and terminals. Students must complete the project by his/her own as a hands-on homework. Students will turn the assembled electronic circuit and the assembling project technical report, and orally present the circuit operation. Presentation should include all the technical details were required to complete the project.</p> <p>Final PCB Project: Creating a complete electronic circuit as a printed circuit board (PCB) from scratch. Students will be required to follow the step-by-step procedure that is set and provided by instructor to build the project. Students should select the project of any simple circuit that is with good basic application from any solid technical reference, which is available on internet or textbooks. Students will turn the complete PCB project including the project technical report, and orally present the circuit operation. Presentation includes all the technical details were required to complete the project.</p>								
<p>Student Assessment(s)</p>	<table border="0"> <tr> <td>Hands-on and computer based Assignments</td> <td style="text-align: right;">40%</td> </tr> <tr> <td>Technical reports assignments</td> <td style="text-align: right;">10%</td> </tr> <tr> <td>Midterm soldering and assembling project including the project technical report</td> <td style="text-align: right;">20%</td> </tr> <tr> <td>Final term PCB project including the project technical report</td> <td style="text-align: right;">30%</td> </tr> </table>	Hands-on and computer based Assignments	40%	Technical reports assignments	10%	Midterm soldering and assembling project including the project technical report	20%	Final term PCB project including the project technical report	30%
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<p>Instructor's Requirements</p>	<p><u>As your Instructor, it is my responsibility to:</u></p> <ul style="list-style-type: none"> • Provide the grading scale and detailed grading formula explaining how student grades are to be derived • Facilitate an effective learning environment through class activities, discussions, and lectures • Description of any special projects or assignments • Inform students of policies such as attendance, withdrawal, tardiness and make up • Provide the course outline and class calendar which will include a description of any special projects or assignments • Arrange to meet with individual students before and after class as required <p><u>To be successful in this class, it is the student's responsibility to:</u></p> <ul style="list-style-type: none"> • Attend class and participate in class discussions and activities 								

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	<ul style="list-style-type: none"> • Purchase all the tools, materials, and circuit kits to complete the projects are required in this course. • Write notes of the instructions are provided by the instructor. • Read and comprehend the web enhanced provided materials. • Complete the required assignments and projects: • Ask for help when there is a question or problem • Keep copies of all paperwork, including this syllabus, handouts and all assignments
<p>Instructor Grading Criteria</p>	<p>Your instructor will conduct assignments, projects, and assessments that you can use to determine how successful you are at achieving the course learning outcomes (mastery of course content and skills) outlined in the syllabus. If you find you are not mastering the material and skills, you are encouraged to reflect on how you study and prepare for each class. Your instructor welcomes a dialogue on what you discover and may be able to assist you in finding resources on campus and/or online websites that will improve your performance.</p> <p>All grading criteria of the technical reports, midterm, and final term projects are provided on Canvas. The instructor will provide all grading criteria of the assignments in classroom.</p> <p>Students will be able to review their final grades after completing the assignments. Technical reports assignments will be graded and turned on to students after one to two weeks of the submission date of each assignment. All assignments will be graded and feedback provided at completion time. Grades of all assignments will be posted in Canvas within one to two days.</p> <p><i>Attendance is required. Late assignment will not be accepted after two weeks from the submission date of that assignment. Extra points might be given for students are recognized with good participation.</i></p>
<p>Instructional Materials</p>	<p>Students need to purchase all the tools, materials, and the circuit kit to complete the projects are required in this course.</p> <p>Students need to read and follow the updated instructional details provided on learning web and Canvas. In addition, presentations and videos those are provided on Canvas are good source for students to understand the course main technical subjects.</p> <p>Textbook is optional: Quality Hand Soldering and Circuit Board Repair, 5th edition, H. Smith. Published by Cengage Learning. ISBN-10: 1-4283-2199-3, ISBN-13: 978-1-4283-2199-1.</p>
<p>HCC Grading Scale:</p>	<p>The HCC grading scale is:</p>

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	<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">A = 100 – 90</td> <td style="text-align: right;">4 points per semester hour</td> </tr> <tr> <td>B = 89 – 80</td> <td style="text-align: right;">3 points per semester hour</td> </tr> <tr> <td>C = 79 – 70</td> <td style="text-align: right;">2 points per semester hour</td> </tr> <tr> <td>D = 69 – 60</td> <td style="text-align: right;">1 point per semester hour</td> </tr> <tr> <td>59 and below = F</td> <td style="text-align: right;">0 points per semester hour</td> </tr> <tr> <td>FX (Failure due to non-attendance)</td> <td style="text-align: right;">0 points per semester hour</td> </tr> <tr> <td>IP (In Progress)</td> <td style="text-align: right;">0 points per semester hour</td> </tr> <tr> <td>W (Withdrawn)</td> <td style="text-align: right;">0 points per semester hour</td> </tr> <tr> <td>I (Incomplete)</td> <td style="text-align: right;">0 points per semester hour</td> </tr> <tr> <td>AUD (Audit)</td> <td style="text-align: right;">0 points per semester hour</td> </tr> </table> <p>IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses.</p> <p>To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP", "W", "AUD", "COM" and "I" do not affect GPA.</p> <p>Incompletes The grade of "I" (Incomplete) is conditional. A student receiving an "I" must arrange with the instructor to complete the course work within six months of the end of the incomplete term. After the deadline, the "I" becomes an "F." Upon completion of the coursework, the grade will be entered as I/grade on the student transcript. All "I"s must be changed to grades prior to graduation.</p>	A = 100 – 90	4 points per semester hour	B = 89 – 80	3 points per semester hour	C = 79 – 70	2 points per semester hour	D = 69 – 60	1 point per semester hour	59 and below = F	0 points per semester hour	FX (Failure due to non-attendance)	0 points per semester hour	IP (In Progress)	0 points per semester hour	W (Withdrawn)	0 points per semester hour	I (Incomplete)	0 points per semester hour	AUD (Audit)	0 points per semester hour
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Syllabus Modifications	<p>The instructor reserves the right to modify the syllabus, course requirements, assignments, homework, grading procedures and any other related policies as changes take place during the semester. However, proper verbal notice will be given to students in the class.</p>																				
Attendance	<p><u>Attendance and Withdrawal Policies</u></p> <p>Students are expected to attend all the theory lectures, participate in tests or quizzes and perform their assignments, home-work and laboratory tasks (if applicable) or when necessary. Any student, who is absent more than 12.5% of the class and lab combined, will be told to withdraw from the course. See the student handbook, Course Schedule, or Catalog for details. Drops and</p>																				

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withdrawals are the student’s responsibility. (The instructor will not be responsible for drops or withdrawals).
Based on the State Funding rules for spring and fall semesters attending to the class for the first two sessions are mandatory. For summer semesters all students must attend to the class for the first day. Students who don’t follow these rules will automatically be dropped from the course.
Tardiness (lateness to class) policy: Be on time for each class meeting.

HCC Policies

HCC Policies
 Here’s the link to the HCC Student Handbook <http://www.hccs.edu/resources-for/current-students/student-handbook/> In it you will find information about the following:

Academic Information	Incomplete Grades
Academic Support	International Student Services
Attendance, Repeating Courses, and Withdrawal	Health Awareness
Career Planning and Job Search	Libraries/Bookstore
Childcare	Police Services & Campus Safety
disAbility Support Services	Student Life at HCC
Electronic Devices	Student Rights and Responsibilities
Equal Educational Opportunity	Student Services
Financial Aid TV (FATV)	Testing
General Student Complaints	Transfer Planning
Grade of FX	Veteran Services

EGLS³
 The EGLS³ (Evaluation for Greater Learning Student Survey System) will be available for most courses near the end of the term until finals start. This brief survey will give invaluable information to your faculty about their teaching. Results are anonymous and will be available to faculty and division chairs after the end of the term. EGLS³ surveys are only available for the Fall and Spring semesters. -EGLS3 surveys are not offered during the Summer semester due to logistical constraints.
<http://www.hccs.edu/resources-for/current-students/egls3-evaluate-your-professors/>

Campus Carry Link
 Here’s the link to the HCC information about Campus Carry:
<http://www.hccs.edu/departments/police/campus-carry/>

HCC Email Policy
 When communicating via email, HCC requires students to communicate only through the HCC email system to protect your privacy. If you have not

activated your HCC student email account, you can go [to HCC Eagle ID](#) and activate it now. You may also use Canvas Inbox to communicate.

Housing and Food Assistance for Students

Any student who faces challenges securing their foods or housing and believes this may affect their performance in the course is urged to contact the Dean of Students at their college for support. Furthermore, please notify the professor if you are comfortable in doing so.

This will enable HCC to provide any resources that HCC may possess.

Office of Institutional Equity

Use the link below to access the HCC Office of Institutional Equity, Inclusion, and Engagement (<http://www.hccs.edu/departments/institutional-equity/>)

disAbility Services

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/support-services/disability-services/>

Title IX

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross
Director EEO/Compliance
Office of Institutional Equity & Diversity
3100 Main
(713) 718-8271
Houston, TX 77266-7517 or Institutional.Equity@hccs.edu

<http://www.hccs.edu/departments/institutional-equity/title-ix-know-your-rights/>

Office of the Dean of Students

Contact the office of the Dean of Students to seek assistance in determining the correct complaint procedure to follow or to identify the appropriate academic dean or supervisor for informal resolution of complaints.

<https://www.hccs.edu/about-hcc/procedures/student-rights-policies--procedures/student-complaints/speak-with-the-dean-of-students/>

Tutoring

HCC provides free, confidential, and convenient academic support, including writing critiques, to HCC students in an online environment and on campus. Tutoring is provided by HCC personnel in order to ensure that it is contextual and appropriate. Visit the [HCC Tutoring Services](#) website for services provided.

Libraries

The HCC Library System consists of 9 libraries and 6 Electronic Resource Centers (ERCs) that are inviting places to study and collaborate on projects. Librarians are available both at the libraries and online to show you how to locate and use the resources you need. The libraries maintain a large selection of electronic resources as well as collections of books, magazines, newspapers, and audiovisual materials. The portal to all libraries' resources and services is the HCCS library web page at <http://library.hccs.edu>.

Supplementary Instruction

Supplemental Instruction is an academic enrichment and support program that uses peer-assisted study sessions to improve student retention and success in historically difficult courses. Peer Support is provided by students who have already succeeded in completion of the specified course, and who earned a grade of A or B. Find details at <http://www.hccs.edu/resources-for/current-students/supplemental-instruction/>.

Department Chair Contact Information

Department Chair Name: Hosein Tahvillian
Department Chair Email address: hosein.tahvillian@hccs.edu
Department Chair Office phone number: 713-718-2135