

**ELECTRICAL & COMPUTER ENGINEERING ARTICULATION GUIDE**

North Central State College – AAS in Integrated Engineering Technology  
 Eastern Michigan University – BS in Electrical and Computer Engineering

**North Central State College Courses:****Transfer to Eastern Michigan University as:****Ohio Transfer Module + EMU Diversity Requirement (41 credits)**

Students who have completed the Ohio Transfer Module (OTM) have satisfied EMU's General Education Core Requirements and will be required to complete only the EMU General Education Application Requirements of one "Perspectives on a Diverse World" course, one "Learning Beyond the Classroom" experience, and one "Writing Intensive" course in the major. Specific courses listed below for the OTM will also satisfy major requirements at NCSC and/or EMU.

**1. English Composition: Two courses required**

ENGL 1010 English Composition I.....	3	WRTG 120 Composition I.....	3
ENGL 1030 English Composition II.....	3	WRTG 121 Composition II (GEEC).....	3

**2. Mathematics: Two courses required**

*MATH 1150 Calculus I (in place of MATH 1050).....	5	MATH 120 Calculus I (4)+1 (GEQR).....	5
*MATH 1151 Calculus II (in place of MATH 1051).....	5	MATH 121 Calculus II (4)+1.....	5

**3. Arts/Humanities: Two courses from different disciplines**

HIST 1010 American History I or 1030 American History II..	3	General Education Social Sciences (GEKS).....	3
HUMA 1010; PHIL 1010, 1110.....	3	General Education Humanities (GEKH).....	3

**4. Social Sciences: Two courses from different disciplines**

ECON 1010 Intro to Economics.....	3	General Education Social Sciences (GEKS).....	3
<sup>1</sup> SOCY 2010 or PSYC 1070.....	3	Perspectives on a Diverse World Requirement.....	3

**5. Natural and Physical Sciences: Three courses from two disciplines (one lab required)**

*CHEM 1210 Chemistry I (in place of CHEM 1030).....	5	CHEM 121/122 General Chemistry I (4)+1 (GEKN).....	5
*PHYS 2010 College Physics I (in place of PHYS 1110).....	4	sub for <b>PHY 223</b> Mechanics and Sound (5)-1 (GEKN).....	4
*PHYS 2030 College Physics II (in place of PHYS 1130).....	4	sub for <b>PHY 224</b> Electricity and Light (5)-1.....	4

**NCSC Integrated Engineering Technology Program (33 credits)**

ELET 1510 DC Electricity.....	3	University Elective (ELEC 200).....	3
ELET 1520 AC Electricity.....	3	University Elective (ELEC 210).....	3
*ENGR 1010 Introduction to Engineering (2) and			
*MECT 1150 Fundamentals of Engineering Design (2) and			
*ENRD 2150 Computer Aided Design I (3).....	7	ME 100 Intro to Engr Design & Manufacturing (3)+4....	7
*ELET 1530 Digital Principles.....	4	EECE 251 Digital Logic Design (3)+1.....	4
ELET 2240 Programmable Logic Controllers.....	3	University Elective (CET 000).....	3
ELET 2450 Electronics.....	3	University Elective (ELEC 000).....	3
MECT 2230 Engineering Materials.....	3	University Elective (MET 000).....	3
MECT 2330 Statics.....	3	University Elective (MET 000).....	3
MECT 2440 Strength of Materials.....	3	University Elective (MET 000).....	3
MECT 2910 Mechanical Design Project.....	1	University Elective (MET 000).....	1

**Credits at NCSC: ..... 74****Credits that apply to EMU's program ..... 67**

\* Required for EMU's Electrical and Computer Engineering program. If not transferred, must be completed at EMU.

<sup>1</sup> Satisfies EMU's Perspectives on a Diverse World Requirement.

**Sign up with us:** If you let us know you are using this articulation agreement we can stay in touch with you and provide information and advising to you while you are still at your community college.

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**Completion of the Electrical & Computer Engineering Program at EMU****Major Requirements (57 credits)****Math and Science Courses (10 credits)**

MATH 122	Elementary Linear Algebra.....	3
MATH 223	Multivariable Calculus .....	4
MATH 325	Differential Equations.....	3

**Foundational Courses (9 credits)**

CET 151	Intro to Computing in Engineering Tech.....	3
COSC 111	Intro to Programming .....	3
SET 350W	Engineering Communication.....	3

**Electrical & Computer Engineering (26 credits)**

EECE 212	Engineering Circuit Analysis .....	3
EECE 213	Engineering Circuit Analysis II .....	3
EECE 341	Engineering Electronics I .....	3
EECE 351	Microcontrollers.....	3
EECE 371	Signals and Systems.....	3
EECE 400	EECE Professional Practice.....	2
EECE 421	Control Systems Engineering.....	3
EECE 430	Power Electronics .....	3
EECE 480	Senior Capstone .....	3

**Concentration (12 credits)**

Choose one concentration from the following

**Computer Engineering Concentration**

COSC 211	Programming Data Structures.....	3
COSC 221	Computer Organization.....	3
EECE 352	Digital System Designs with HDL.....	3
EECE 452	Adv. Digital System Designs with FPGA.....	3

**Electrical Engineering Concentration**

EECE 342	Engineering Electronics II.....	3
EECE 365	Engineering Electromagnetics.....	3
EECE 372	Communication Systems.....	3
EECE 431	Digital Control Systems .....	3

**LBC Requirement (0-3 credits)**

Students must complete one Learning Beyond the Classroom course or noncredit experience offered by EMU. Consult your advisor for options.

<b>Credits at EMU .....</b>	<b>57</b>
<b>Transfer Credits that apply to program .....</b>	<b>67</b>
<b>Credits to Graduate .....</b>	<b>124</b>

**Substitutions** for PHY 223 and PHY 224, transferred from NCSC, must be added to the EMU transcript. Contact the program advisor at EMU to submit a substitution form.

**Sample Sequence:**

Courses may not be offered every semester. See the COT advisor to create a program of study.

**Semester 1 (12 credits)**

MATH 122	FW (prereq: MATH 105 with "C" or 120 or 112).....	3
CET 151	FW .....	3
COSC 111	FWS prereq: MATH 104 .....	3
EECE 212	(prereq: MATH 121 and PHY 223) .....	3

**Semester 2 (9 credits)**

MATH 223	FW (prereq: MATH 121 with "C").....	3
EECE 213	(prereq: CET 151, COSC 111, MATH 120, 121) .....	3
EECE 341	(prereq: EECE 212 or ELEC 212).....	3

**Semester 3 (12 credits)**

MATH 325	(prereq: MATH 121 and 122).....	3
EECE 351	(prereq: CET 151, COSC 111 or COSC 246, PHY 223, MATH 120 & 121).....	3
EECE 371	(prereq: EECE 213) .....	3
EECE 430	(prereqs EECE 341) .....	3

**Complete one Concentration below:****ECE Computer Engineering Concentration****Semester 4 (12 credits)**

COSC 211	(prereq: COSC 111).....	3
COSC 221	(prereq: COSC 111 or 146 or 246).....	3
EECE 352	(prereq: EECE 251 & 351 and ECE major) .....	3
EECE 421	(prereq: EECE 371) .....	3

**Semester 5 (8 credits)**

EECE 400	(prereq: EECE 212, 213, 251, 341, 351, 371 & 421)....	2
EECE 452	(prereq: EECE 352 min grade C).....	3
SET 350W	(prereq: WRTGL 121) .....	3

**Semester 6**

EECE 480	(prereqs: EECE 212, 213, 251, 341, 351, 371, 400, 421)....	2
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**ECE Electrical Engineering Concentration****Semester 4 (9 credits)**

EECE 342	(prereq EECE 341) .....	3
EECE 365	(prereqs: EECE 212, MATH 223, PHY 224).....	3
EECE 421	(prereq: EECE 371) .....	3

**Semester 5 (8 credits)**

EECE 400	(prereqs: EECE 212, 213, 251, 341, 351, 371 & 421)....	2
EECE 431	(prereqs: EECE 421 min grade C-).....	3
SET 350W	(prereq: ENGL 121) .....	3

**Semester 6 (5 credits)**

EECE 372	(prereq EECE 371 min grade C) .....	3
EECE 480	(prereqs: EECE 212, 213, 251, 341, 351, 371, 400, 421)....	2

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### Additional Information:

1. Each institution will determine the satisfaction of their individual program and degree requirements. Both North Central State College and EMU agree to accept transferable courses from each other and from other regionally accredited institutions. North Central State College courses indicated with an \* are required for EMU's BS in Electrical and Computer Engineering. Substitutions for these courses must be approved by the EMU program coordinator.
2. Students with the Ohio Transfer Module endorsement on their community college transcript have satisfied EMU's General Education Core Requirements and will be required to complete only the General Education Application Requirements of one Perspectives on a Diverse World course, one "Learning Beyond the Classroom" experience, and a Writing Intensive course in the major. The "Perspectives on a Diverse World" requirement may be transferred to EMU. For assistance in transferring the OTM, contact the Director of Community College Relations, [ckibin@emich.edu](mailto:ckibin@emich.edu).
3. Only courses with a grade of "C" or better (2.0 on a 4.0 scale) will be accepted for transfer to either institution.
4. Under this agreement, EMU will waive the 60 hour rule, and require that a minimum of 57 credit hours be completed at the four-year college level, of which 30 hours must be in courses taken at EMU, with 15 hours in major requirements, at the 300-level or above. Of the last 30 hours completed before graduating, at least 10 hours must be in courses offered by EMU. A minimum of 124 credit hours, completed in-residence or accepted in transfer, is required for graduation.
5. To be admitted to the Electrical and Computer Engineering program, students must have:
  - A minimum EMU cumulative GPA of a 2.5 or a combined 2.5 transfer GPA from all transfer institutions
  - Completion of PHY 224 (NCSC PHYS 2030) with a grade of "C" or higher
  - Completion of MATH 120 (NCSC MATH 1150) and MATH 121 (NCSC MATH 1151) with a grade of "C" or higher
  - Completion of EECE 212 with a grade of C or higher
6. Students who wish to be admitted must submit an application online by October 1, February 1, or July 1 and attend a mandatory meeting with a Mechanical Engineering faculty member of COT Staff Advisor. Students must satisfy all admission requirements at the time of application for admission to EMU, including submitting transcripts from all previously attended colleges. NCSC students will receive equal consideration with other students for course registration and financial aid. Ohio undergraduate students will receive EMU's in-state tuition rate.
7. Students are encouraged to contact the College of Engineering & Technology Student Service Office before applying to EMU. To facilitate advising and the evaluation of transcripts, sign up for this articulation agreement, and bring a copy of the articulation guide to all advising sessions.

### Effective dates: September 1, 2020 until August 31, 2023

This agreement is consistent with the 2020-2021 catalog. Students have until summer 2028 to graduate from Eastern Michigan University following this agreement. In the event that a student does not complete the program within seven years, they may be required to have their credits reevaluated using the requirements of the current articulation guide.

### Contacts:

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**Eastern Michigan University**  
 College of Engineering & Technology  
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 Qin Hu, ECE Program Coordinator