

# TRANSFER PATHWAY GUIDE

# 2019-2020

Associate of Applied Science in Engineering and Electronics Technology – Robotics and Automation Track To Bachelor of Science in Mechatronics Engineering Technology

## Overview

Completion of the following curriculum will satisfy the requirements for the Associate of Applied Science in Engineering and Electronics Technology-Robotics and Automation Track degree at a KCTCS school and leads to the Bachelor of Science in Mechatronics Engineering Technology degree at Northern Kentucky University.

## Applying to the KCTCS2NKU Program

Students can apply to participate in the pathway program by completing the online application on the NKU transfer webpage. Students must be enrolled in at least six credit hours at their KCTCS institution, enrolled in an associate degree program, plan to transfer to NKU, and maintain a minimum 2.0 cumulative GPA at their KCTCS institution.

## Degree Requirements for KCTCS

1) completion of minimum 60 credit hours, 2) minimum cumulative GPA 2.0, 3) minimum of 25 percent of credit hours required for the degree earned at the institution awarding the degree, 4) demonstration of digital literacy.

## Admission Requirements to NKU

Students completing an associate degree with a cumulative GPA of 2.0 or higher will be accepted into NKU.

## Degree Requirements for NKU

To earn a bachelor’s degree at NKU, students must complete a minimum of 120 credit hours with at least 45 credit hours numbered 300 and above. In addition, at least 25% of the credit hours required for the degree and the last 30 credit hours must be completed at NKU. Students must have an overall GPA of 2.0 and meet all prerequisites for courses and requirements for the major. In some cases, students must complete a focus or minor as indicated on the pathway.

## General Transfer Information

Students must complete the online application to NKU. There is no application fee for students who are transferring from a KCTCS institution.

**Note:** The equivalencies to NKU courses listed in this pathway document apply only to students who graduate from a FANUC certified program. Students must present NKU with their FANUC certificate or proof of completion of a FANUC certified program in order to get credit for the specified courses. Courses from non-certified programs will transfer into NKU as elective credit.

**KCTCS Scholars Award**: Students who are KY residents transferring directly from a KCTCS institution with at least 36 hours from that institution and minimum GPA of 3.0, were never enrolled as a degree-seeking student at NKU, and will be enrolled in at least 12 credit hours both fall and spring semester are eligible for a limited number of $2,500 annual scholarships ($1,250 per fall and spring). Students must gain admission to NKU by June 15 for fall and November 1 for spring to be eligible for a possible scholarship. Online accelerated programs are not eligible for the KCTCS Scholars Award.

### KCTCS AAS IN ENGINEERING AND ELECTRONICS TECHNOLOGY – ROBOTICS AND AUTOMATION TRACK TO ­­­­­­­­­­­­­­­NKU BS IN MECHATRONICS ENGINEERING TECHNOLOGY CHECKLIST

### Kentucky Community and Technical College System

#### Category 1: KCTCS General Education Requirements

| **KCTCS Course** | **Course or Category** | **Credits** | **NKU Course** | **Completed** |
| --- | --- | --- | --- | --- |
| ENG 101 | Writing I (WC) | 3 | ENG 101 |  |
| TBS XXX | Oral Communication (OC) | 3 | TBD XXX |  |
| MAT 150 or  MAT 126 or higher | College Algebra (QR) or  Technical Algebra and Trigonometry (QR) or Higher Numbered (QR) Course | 3 | (MAT 102 or MAT 103) + MAT 100T MAT 100T  TBD XXX |  |
| TBS XXX | Social & Behavioral Sciences (SB) | 3 | TBD XXX |  |
| TBS XXX | Arts & Humanities (AH) - Heritage or Humanities | 3 | TBD XXX |  |
| PHY 171 or  PHY 201/202 or TBS XXX | Applied Physics (NS) or  College Physics I and Lab (SL) or  Natural Science with consent of program coordinator (NS) | 3-5 | PHY 110  PHY 211/200T  TBD XXX |  |
|  | **Subtotal General Education Courses** | **18-20** |  |  |

TBS XXX means to be selected by KCTCS student.

TBD XXX means to be determined by NKU based on course selected.

A grade of A or B in MAT 150 equates to MAT 103 + MAT 100T. Grade of C or D in MAT 150 equates to MAT 102 + MAT 100T.

#### Category 2: KCTCS Technical Core Requirements for the AAS Degree

| **KCTCS Course** | **Course or Category** | **Credits** | **NKU Course** | **Completed** |
| --- | --- | --- | --- | --- |
| ELT 110 | Circuits I | 5 | EGT 161 |  |
| ELT 114 | Circuits II | 5 | EGT 243 |  |
| ELT 120 | Digital I | 3 | EGT 300T |  |
| ELT 210 | Devices I | 4 | EGT 300T |  |
| ELT 289 | Engineering and Electronics Technology Capstone Course | 1 | UND 100T |  |
| CAD 100 or  CAD 103 or  BRX 120 | Introduction to Computer Aided Design or  CAD Fundamentals or  Basic Blueprint Reading or  Equivalent course with consent of program coordinator | 3-4 | EGT 212  UND 100T  UND 200T  TBD XXX |  |
| TBS XXX | Digital Literacy (If took CAD 103, need additional elective credit not in selected track) | 3 | TBD XXX |  |
|  | **Subtotal Technical Core Courses** | **24-25** |  |  |

#### Category 3: KCTCS AAS Degree Requirements

| **KCTCS Course** | **Course or Category** | **Credits** | **NKU Course** | **Completed** |
| --- | --- | --- | --- | --- |
| DIL XXX | Digital Literacy | 0-3 |  |  |
| ELT 244 or  EET 270 and  EET 271 | Electrical Machinery and Controls or  Electrical Motor Controls I and Lab | 4 | ELT 244 +  ELT 250 =  EGT 386 + EGT 300T or  EGT 200T |  |
| ELT 250 or  EET 276 and  EET 277 | Programmable Logic Controllers or  Programmable Logic Controllers and Lab | 4 | ELT 244 +  ELT 250 =  EGT 386 + EGT 300T or  UND 200T |  |
| ELT 260 | Robotics and Industrial Automation | 5 | EGT 320 |  |
| ELT 265 | Applied Fluid Power | 3 | UND 100T |  |
| TBS XXX | Technical Electives  Possible Technical Electives  ELT 201 (ELT 201 = EGT 300)  ELT 220 (ELT 120 + ELT 220 = EGT 245 + EGT 300T)  ELT 214 (ELT 210 + ELT 214 = EGT 344 + EGT 300T)  ISM 210 (ISM 210 + ELT 250 = EGT386 + EGT300T)  CMM 110 (CMM 110 = EGT 265) | 4  (4)  (3)  (4)  (3) | EGT 300  EGT 245  EGT 344  EGT 386  EGT 265 |  |
|  | **Subtotal AAS Degree Requirement Courses** | **20-22** |  |  |
|  | **Total Associate Degree Hours** | **62** |  |  |

Students must demonstrate computer/digital literacy skills, either through completing a course or passing a test.

Note: The following courses have equivalencies to courses required in the Mechatronics Engineering Technology major at NKU. By selecting these courses, a student will reduce the total credit hours for the BS in Mechatronics Engineering Technology degree: MAT 150, PHY 201and PHY 202, CAD 100, CMM 110, ELT 220, ELT 244, ELT 250, and ISM 210.

### Northern Kentucky University

#### Category 4: Additional General Education Courses

| **NKU**  **Course** | **Course or Category** | **Credits** | **KCTCS**  **Course** | **Taken at KCTCS** |
| --- | --- | --- | --- | --- |
| ENG 102 | Advanced College Writing | 3 | ENG 102 |  |
| CHE 130/130L | Chemistry for Engineering Technology and Lab | 4 |  |  |
| TBS XXX | Self and Society | 6 |  |  |
| TBS XXX | Culture and Creativity | 3 |  |  |
| TBS XXX | Global Viewpoints | 3 |  |  |
|  | **Subtotal General Education Credit Hours** | **19** |  |  |

#### Category 5: Major Requirements for BS in Mechatronics Engineering Technology

| **NKU**  **Course** | **Course** | **Credits** | **KCTCS**  **Course** | **Taken at KCTCS** |
| --- | --- | --- | --- | --- |
| EGT 161 | D.C. Circuit Analysis | 3 | ELT 110 | x |
| EGT 212 | Computer-Aided Drafting and Design | 3 | CAD 100 | x |
| EGT 243 | A.C. Circuit Analysis | 3 | ELT 114 | x |
| EGT 245 | Digital Electronics | 3 | ELT 120 +  ELT 220 =  EGT 245 +  EGT 300T | x  note below category 3 table |
| EGT 261 | Engineering Materials | 3 |  |  |
| EGT 265 | Manufacturing Processes and Metrology | 3 | CMM 110 | x  note below category 3 table |
| EGT 267 | Programming for Engineering Applications | 3 |  |  |
| EGT 300 | Statics and Strength of Materials | 3 | ELT 201 |  |
| EGT 301 | Cooperative Education in Engineering Technology | 3 |  |  |
| EGT 310 | Project Management and Problem Solving | 3 |  |  |
| EGT 317 | Introduction to Capstone Project in EGT | 1 |  |  |
| EGT 340 | Applied Dynamics | 3 |  |  |
| EGT 361 | Fluid Power | 3 | FPX100/101 |  |
| EGT 367 | Microprocessors | 3 |  |  |
| EGT 408 | Mechatronics Topics | 3 |  |  |
| EGT 417 | Senior Design in Technology | 2 |  |  |
| EGT 448 | Network Hardware | 3 |  |  |
| EGT 480 | Machine Design | 3 |  |  |
| CHE 130/130L | Chemistry for Engineering Technology and Lab | 4 |  |  |
| MAT 119 | Precalculus Mathematics | 3 | MAT 155 or  MAT 160 |  |
| MAT 128 and MAT 227 or MAT 129 | Calculus A and  Calculus B or  Calculus I | 4-6 | MAT 175 |  |
| STA 205 | Statistical Methods | 3 | STA 220 or  (MAT 151 or STA 151 or MAT 161) + STA 251 |  |
| PHY 211 | General Physics with Laboratory I | 5 | PHY 201/202 | x  note below category 3 table |
| PHY 213 | General Physics with Laboratory II | 5 | PHY 203/204 |  |
|  | Choose one track:  Automated Systems Track  Alternative Energy Track  Laser Technology Track  Computer Science Track  (Required courses for each track are listed in Category 6 tables.) | 15-18 |  |  |
|  | **Subtotal Major Credit Hours at NKU** | **70-75** | 70 |  |
|  | **Subtotal Major Credit Hours KCTCS** | **23-26** |  |  |
|  | **Total Major Credit Hours** | **96-98** |  |  |
|  | **Minimum Baccalaureate Degree Credit Hours** | **151** |  |  |

Students must choose one of the following tracks: Automated Systems Track, Alternative Energy Track, Laser Technology Track or Computer Science Track. Credits hours for the tracks and bachelor degree can vary based on the courses taken at KCTCS. The total credit hours for each track are based on the student completing the recommended courses while at KCTCS. Some courses in the Alternative Energy Track and the Laser Technology track will be taken at Cincinnati State Technical and Community College.

#### Category 6: NKU Requirements for the Automated Systems Track

| **NKU**  **Course** | **Course or Category** | **Credits** | **KCTCS**  **Course** | **Taken at KCTCS** |
| --- | --- | --- | --- | --- |
| EGT 320 | Robotic Systems and Material Handling | 3 | ELT 260 | x |
| EGT 365 | CNC & Manufacturing Process Planning | 3 |  |  |
| EGT 386 | Electro-Mechanical Instrumentation and Control | 3 | ISM 210 + ELT 250 = EGT 386 + EGT 300T  ELT 244 + ELT 250 = EGT 386 + EGT 300T | x  note below category 3 table |
| EGT 465 | Automated Manufacturing Systems | 3 |  |  |
| EGT XXX | Select 9 elective credit hours of EGT courses at NKU | 9 |  |  |
|  | **Additional Track Credit Hours** | **15** |  |  |

#### Category 6: NKU Requirements for the Alternative Energy Track

| **NKU**  **Course** | **Course or Category** | **Credits** | **KCTCS**  **Course** | **Taken at KCTCS** |
| --- | --- | --- | --- | --- |
| Take at CState  (equates to  EGT 140) | Power Systems Foundations  (PSET 140 at Cincinnati State) | 3 |  |  |
| Take at CState  (equates to  EGT 151) | Introduction to Controls and Robotics  (EMET 150 at Cincinnati State) | 2 |  |  |
| Take at CState  (equates to  EGT 210) | Energy Efficiency and Audits  (EMET 210 at Cincinnati State) | 3 |  |  |
| Take at CState  (equates to  EGT 325) | Solar and Renewable Energy  (EMET 225 at Cincinnati State) | 3 |  |  |
| EGT 450 | Thermodynamics and Heat Transfer | 3 |  |  |
| EGT XXX  (Need 1 course) | Select 9 elective credit hours of EGT courses | 9 | ELT 260 = EGT 320  ELT 244 + ELT 250 = EGT 386 + EGT 300T | x  (6 cr.) |
|  | **Additional Track Credit Hours** | **17** |  |  |

#### Category 6: NKU Requirements for the Laser Technology Track

| **NKU**  **Course** | **Course or Category** | **Credits** | **KCTCS**  **Course** | **Taken at KCTCS** |
| --- | --- | --- | --- | --- |
| Take at CState  (equates to  EGT 151) | Introduction to Controls and Robotics  (EMET 150 at Cincinnati State) | 2 |  |  |
| Take at CState (equates to  EGT 293) | Laser Foundations and Safety  (EMET 245 at Cincinnati State) | 3 |  |  |
| Take at CState (equates to  EGT 294) | Electric Drive Mechanisms  (EMET 275 at Cincinnati State) | 4 |  |  |
| Take at CState (equates to  EGT 395) | Laser 2  (EMET 246 at Cincinnati State) | 4 |  |  |
| EGT XXX  (Need 1 course) | Select 9 elective credit hours of EGT courses | 9 | ELT 260 = EGT 320  ELT 244 + ELT 250 =  EGT 386 + EGT 300T | x  (6 cr.) |
|  | **Additional Track Credit Hours** | **16** |  |  |

#### Category 6: NKU Requirements for the Computer Science Track

| **NKU**  **Course** | **Course or Category** | **Credits** | **KCTCS**  **Course** | **Taken at KCTCS** |
| --- | --- | --- | --- | --- |
| CSC 260 | Object Oriented Programming I | 3 | CIT 149 + CIT 249 = CSC 260 + CSC 360 |  |
| CSC 360 | Object Oriented Programming II | 3 | CIT 149 + CIT 249 = CSC 260 + CSC 360 |  |
| CSC 362 | Computer Systems | 3 |  |  |
| CSC 407 | Concepts of Programming Languages | 3 |  |  |
| CSC 462 | Computer Architecture | 3 |  |  |
| CIT 371 | Unix Systems | 3 |  |  |
| TBS XXX | Select 3 elective credit hours of EGT, INF, CIT or CSC | 3 | ELT 260 = EGT 320 | x |
|  | **Additional Track Credit Hours** | **18** |  |  |

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