KTECH®

COURSE CATALOG

goktech.org

140 Castle Drive Madison, AL 35758 256-880-3455

Message From the Founder/CEO

Lee Marshall

Welcome to KTECH, a workforce training initiative of Kids to Love.

As you explore these pages, you'll discover how KTECH is different.

KTECH offers hands-on, one-on-one instruction to connect you to a career in the growing advanced manufacturing industry. Through our program featuring Mechatronics supported by Snap-on Tools, you will be exposed to the foundations of industrial mechanics and maintenance. We also offer Industrial Robotics and Soldering to help "level up" your skills from other workers.

In addition, our Virtual Reality Academy can prepare you to enter an exciting and innovative industry segment in its infancy. The path you choose to pursue can prepare you for up to four industry recognized certifications.

Life Lab Academy helps you develop not just as a student, but as a person. You'll receive expert guidance in areas such as healthy living, financial security and interview skills.

Our students are family, and our team works hard to support them in and out of the classroom. We strive every day to serve with excellence, and you will experience it the moment you walk through our doors.

We are excited you are considering KTECH! We can't wait for you to write your success story with us.

Lee Marshall
Founder & CEO
Kids to Love and KTECH

AMBASSADORS

Joe Demos State Farm Agency
Joe Demos
Owner

Element Materials Technology
Heath Dawson
Safety Officer

CB&S Bank
Taron Thorpe
Regional President

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Paul Finley
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Director of Marketing & Communications

Mazda Toyota Manufacturing
Rylee Anderson
Education & Community Specialist

Nextek, Inc.
Annette Statum
Senior Director, Human Resources

Redstone Federal Credit Union
Ian Pinkerton
AVP Business Innovation

Rivenbark & Roper Antiques
Ken Rivenbark
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Two Men And A Truck
Joe Hollingsworth
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David Castaneda
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Technical Training Aids
Travis Coon
President

TTGI
Carl Duckett
Chief Executive Officer

About KTECH®

Since 2004, Kids to Love has met the needs of those in foster care. Foster children interested in college are awarded college scholarships putting them on a pathway to success. Sadly, those aging out of Foster Care without a plan are ending up in prison. The numbers are staggering. 75-80% are in prison. These statistics weighed heavy on the heart of Kids to Love Founder and CEO Lee Marshall and she set out to find a solution. She found the solution at Motlow College with a program in Mechatronics. At Kids to Love, our solution is a workforce training initiative called KTECH.

KTECH is hands-on, interactive, one-on-one instruction connecting students to jobs. In Alabama, as across our nation, there is an increasing shortage of workers with essential technical training. KTECH is open to those aging out of foster care and under-resourced, Veterans, and nontraditional students. By training these groups, we change lives through pathways or second chances at success.

Since its inception in 2016, KTECH has awarded more than 300 certifications. KTECH is one of three schools in Alabama to qualify as a Siemens partner school and we are a private school licensed by the state of Alabama. KTECH meets the needs of both industry and students.

FOR INDUSTRY, there is an increasing shortage of workers with essential technical training.

FOR STUDENTS, there's the need for success and higher earning potential. Mechatronics is an accelerated 16-week course that puts students on the fast-track toward a career in industries such as industrial mechanics, advanced manufacturing, automotive, finance, and healthcare.

KTECH Diploma Track Students are provided training in the foundational areas of safety and maintenance of systems including electrical, mechanical, fluid power, and computer controls. This mechatronics program earns 12-16 semester hours transferable to articulated partners. Credential offered: *Siemens Certified Mechatronics System Assistant.* Integral to KTECH's Diploma Track is our Life Lab, utilizing community volunteers to teach industry-desired soft skills.

KTECH Certificate Track Students can gain experience with soldering (56 hour coursework) and industrial robotics (48 hours). Robotics training leads to the internationally-recognized *Yaskawa Industrial Robotic certification in FS100 Basic Programming with Material Handling*.

KTECH students can select to pursue all of our certifications or select the ones that interest them the most.

Since 2018, we have awarded over three hundred certifications with the addition of Soldering and Robotics students who have graduated KTECH.

In 2020, KTECH expanded its workforce training footprint to train workers at one of north Alabama's leading automotive manufacturers. The KTECH team created customized training with the launch of its first class in August 2020 and continuing in 2021. This achievement, along with our excellent track record, led to our being awarded "Service Provider of the Year" by the Alabama Automotive Manufacturers Association.

Also in 2021, KTECH launched the Virtual Reality (VR) Academy, the only one of its kind in the region. Students use VR computer technology to create immersive 3D simulated environments. While developing unique learning, training and gaming scenarios, students are exposed to Software Management processes equipping them with intern-level development skills while also earning three (3) Computer Science credits.

KTECH® is located in the **Kids to Love Center** at

140 Castle Drive in Madison, Alabama 35758

Equal Opportunity

KTECH encourages the success of each individual. We strive to uphold the rights of the student as he/she takes the vocational journey through our program. KTECH believes that this positive, engaging environment results in higher employee engagement and retention, improved decision making, and increased innovation.

KTECH does not discriminate against people on the basis of race, skin color, age, sex, gender, national origin, religion, economic disadvantage, or mental and/or physical disability.

The KTECH® Vision

Our vision is to establish and sustain a pipeline between industry and a certified employment pool.

The KTECH® Mission

Our mission is to provide specialized workforce training and credentialing for high demand occupations to a targeted, underserved population thereby addressing the following three areas: industry's need for skilled workers, community's need for increased employment rates and the individual's need to be a productive, contributing member of society.

Critical Issues Facing Alabama's Manufacturing Sector

- Budgetary pressures at the state and local levels
- Ever-changing technology
- Average age of the skilled, American worker is now 59
- High cost of training, recruitment and moving expenses
- Loss of apprenticeship programs
- Meeting the needs of new industry recruitment in our area
- High school graduates lack of career readiness

What is Mechatronics?

"Mechatronics" refers to the blending of Mechanical and Electronics systems. The pillars of mechatronics- electrical circuits, mechanical and electric drives, computer programming, and fluid power– all support automated manufacturing system control and maintenance. The study of mechatronics is loosely synonymous with "electromechanical engineering" and "industrial mechanics (millwright)".

The technology inherent in a mechatronics system forms the backbone of sophisticated processes and operations which demand speed and precise performance. Systems which utilize sensors, microprocessors, and advanced controls- advanced manufacturing lines, modern transportation (on land, sea, air and space), power generation and telecommunications to name a few- depend on mechatronic systems technology.

What is Soldering?

Soldering involves the assembly of electrical components and wires to printed circuit boards (PCB). PCBs are integral in almost every electronic device in use today.

What is Robotics?

Robotics involves the operation and programming of industrial machines used in automation of material handling, welding, machining and assembly. Computer control, sensory feedback and information processing are topics intrinsic to the use of robotic systems.

What is Life Lab Academy?

Our Life Lab Academy offers soft skills training highly desired by employers. Community partners– experts in their respective fields– lead these valued sessions. Life Lab is mandatory for Mechatronics students and classes are held every Tuesday from 1-3pm.

Life Lab Academy

Life Lab Academy is a required component of KTECH's Diploma Track program. Life Lab curriculum is embedded in the program training experience and includes lecture, discussion, hands-on application, projects and cooperative learning which are broken up into 4 series of classes.

Character

This series will begin with teaching tools for tackling life. The goal is to build healthy strategies for daily living through teamwork, problem-solving, healthy nutrition and physical fitness.

Wisdom

This series focuses on financial literacy in the areas of budgeting, credit, emergency funds and investing in your future. The goal is to bolster your financial knowledge and tools while working through simulated life situations involving a family, income, savings, housing, transportation and necessities.

Knowledge

This series will enable students to uncover their strengths. Once discovered, students will develop ways to present themselves through their resumes, public speaking and interview skills, along with manners, professional etiquette and attire.

Influence

This series will present the components of success through testimonies of our community partners and KTECH graduates. And because most job application processes are dealing with situational ethics, the *Rotary's 4 Way Test* will define how integrity is carried out on a daily basis in the workplace as well as in your personal life.

Articulation Agreements

KTECH® has articulation agreements in place with several educational institutions for the transfer of credit for the completion of the Mechatronics courses (with a B or above GPA):

Calhoun Community College accepts 12 semester hours for successful completion (A or B) of the KTECH® Mechatronics Program. The credits are accepted as ELT108/109 AC/DC Fundamentals, ILT 163 Digital Fundamentals, and ADM 105 Fluid Power Systems. CCC also accepts 3 semester hours for successful completion of the KTECH® Virtual Reality Academy as Computer Science 101.

Motlow State Community College accepts 15 semester hours for the successful completion of the KTECH® Mechatronics Program.

University of North Alabama accepts 12 semester hours for the successful completion of the KTECH® Mechatronics Program. (MEC 140, MEC 220, MEC 160)

Wallace State Community College accepts 12 semester hours for the successful completion of the KTECH® Mechatronics Program.

University of Alabama Huntsville accepts 12 semester hours the successful completion of the KTECH® Mechatronics Program, 1 hour for J-STD soldering certificate and 1 hour for Yaskawa FS100 Basic Programming

KTECH Faculty

Chris Dow - Lead Instructor
Mechatronics, Robotics, and Soldering
B.S. Mechanical Engineering, University of Maine
Yaskawa Certified Instructor FS100 Basic Programming
Certified IPC Trainer; Universal Robot Instructor
Siemens Certified Instructor, Level 1 Mechatronics
Cognex & Keyence Instructor

Ed Brunner - Instructor
Mechatronics, Virtual Reality
B.S. Electronics Engineering Technology, ECPI University Virginia
Siemens Certified Instructor, Level 1 Mechatronics
Fanuc Handling Tool Operation and Programming
Certification; NCCER Instructor Certification
Cognex & Keyence Instructor; Certified IPC Specialist; Universal Robot Instructor

Karl Liggin - Instructor
Math Review, Robotics, Virtual Reality
B.A. in Vocal Performance, Barry University
Yaskawa Certified Instructor FS100 Basic Programing

Keith Laney - Instructor
Mechatronics
Tennessee College of Applied Technology (TCAT)
Diploma- Industrial Electricity and Electronics
Certifications in: ABB Robotics IRC5 Basic Programming, ABB Robotics IRC5 Mechanical Maintenance, FANUC Robotics R30iA Electrical Maintenance and Tool Operation and Programming
Toyota Motor Manufacturing Group Leader
TCAT - Industrial Maintenance Instructor

Mike Murdock - Instructor Emeritus
Mechatronics Lab Support
Siemens Certified Instructor, Level 1 Mechatronics

KTECH Faculty, continued

Sherrie Maine—Instructor
Soldering
AAS in Aerospace Technology, Calhoun Community College
Certified Aerospace Core Technologies, SpaceTEC

KTECH Staff

Paul Emerson, Recruiting Specialist & Instructor
Mechatronics
B.S. & M.S. Electrical Engineering, Georgia Tech
Inventor/Co-inventor of 13 patents for various electronic circuits

Kelly Croce - Program Coordinator
A.S. General Studies, Calhoun Community College
B.S. Psychology with a concentration in Crisis Counseling, Liberty University

December Guzzo, Therapist
B.S. Psychology—Athens State University
M.A. Social Work—University of Alabama

Programs of Study & Course Descriptions

Mechatronics Lab

Credential: Level 1 Siemens Certified Mechatronics System Assistant

Duration: 16 Week Daytime Accelerated Program

Required Courses:

MECH 1100 Electrical Components

This course is the study of the basic electrical components in a mechatronics system. Topics covered will include basic functions and physical properties of electrical components; the systematic flow of energy and measurement of components; troubleshooting techniques and strategies to identify, localize and correct malfunctions; and systematic preventive maintenance and electrical component safety. Technical documentation such as data sheets, schematics, timing diagrams and system specifications will also be covered.

80 Contact Hours

Required Text: *Electronic Fundamentals Circuits, Devices, and Applications*, 8th edition, Floyd, T.L., Prentice Hall, ISBN #0-13-507295-6, or a suitable substitution as determined by KTECH Staff.

Required Supplies/Materials: Non-Graphing Calculator

Prerequisite(s): 18 years old with either a high school diploma or a GED.*

MECH 1200 Mechanical Components & Electrical Drives

This course is a study of the basic mechanical components and electrical drives in a mechatronics system. Topics covered will include basic function and properties of mechanical components and electrical AC and DC drives; materials, lubrication requirements and surface properties; troubleshooting techniques and strategies to identify, localize and correct malfunctions; and systematic preventive maintenance and electrical component safety. Technical documentation such as data sheets and specifications of mechanical elements and electrical drives will also be covered.

80 Contact Hours

Required Text: *Mechanical Principals and Systems for Industrial Maintenance*, Knotek, Richard. (2006) Prentice-Hall, ISBN# 0-13-049417-8, or a suitable substitution as determined by KTECH Staff.

Required Supplies/Materials: Non-Graphing Calculator

Prerequisite(s): 18 years old with either a high school diploma or a GED.*

MECH 1300 Electro-Pneumatic & Hydraulic Control Circuits

This course covers the basics of pneumatic, electro pneumatic and hydraulic control circuits in a complex mechatronic system. Students will learn the functions and properties of control elements based upon physical principles, and the roles they play within the system. Technical documentation such as data sheets, circuit diagrams, displacement step diagrams and function charts will also be covered. By understanding and performing measurements on the pneumatic and hydraulic control circuits, students will learn and apply troubleshooting strategies to identify, localize and correct malfunctions. Preventive maintenance of (electro) pneumatic and hydraulic components as well as safety issues within the system will be discussed.

80 Contact Hours

Required Text: *Introduction to Fluid Power*, Johnson. (2002), Delmar Cengage Learning ISBN # 0-7668-2365-2, or a suitable substitution as determined by KTECH Staff.

Prerequisite(s): 18 years old with either a high school diploma or a GED.*

MECH 1500 Digital Fundamentals & Programmable Logic Controllers

This course is a study of basic digital logic and programmable logic controllers (PLCs) in a mechatronics system using the automation system. Topics covered will include basic PLC functions and testing; identification of malfunctioning PLCs; and troubleshooting techniques and strategies to identify and localize PLC hardware generated problems. Emphasis is on writing small programs and problem solving using computer simulations.

80 Contact Hours

Required Text: *Programmable Logic Controllers*, 4th ed. Petruzella, McGraw Hill ISBN #0-07-351088-0.

Required Supplies/Materials: Non-Graphing Calculator

Prerequisite(s): 18 years old with either a high school diploma or a GED.*

Academic Review Board may waive course prerequisites on a case by case basis

Soldering Lab

Essentials of Industrial Soldering

This course provides students with foundational hand-soldering skills which can propel them into exciting career opportunities in electronic assembly production. Using industrial-grade equipment found in production sites around the globe, students will learn the soldering process, including safety requirements, setup and preparation, equipment operation, electronic component identification and hands-on soldering/desoldering techniques. Students will be required to prove proficiency through completion of a series of printed circuit boards for evaluation.

Contact Hours: 48

Required Text: *IPC Joint Industry Standard Requirements for Soldered Electrical and Electronic Assemblies*

Required Supplies/Materials: Included in course fee and provided by KTECH

Prerequisite(s): 18 years old with either a high school diploma or a GED.*

IPC-J-STD-001 Certification

Credential: *IPC J-STD-001 Certified Application Specialist*

KTECH® offers modular, hands-on training in manufacture and inspection of soldered electrical and electronic assemblies. Graduates will receive the internationally recognized "Certified IPC Specialist" credential from KTECH's IPC-certified instructors.

Duration: 40 hours **Contact Hours:** 40 Hours

Required Text: IPC (2016) *Joint Industry Standard Requirements for Soldered Electrical and Electronic Assemblies*

Required Supplies/Materials: Included in course fee and provided by KTECH

Prerequisite(s): 18 years old with either a high school diploma or GED*. **Proof of previous soldering experience or successful completion of the Essentials of Industrial Soldering class with KTECH®.***

***The Academic Review Board may waive course prerequisites on a case by case basis.**

Robotics Lab

Robotics Operations and Basic Programming

Credential: *Yaskawa Industrial Robotic Certification in FS100 Basic Programming with Material Handling*

KTECH® offers credentialed training in basic robotics programming on the same Yaskawa technologies deployed in advanced manufacturing environments around the world. The KTECH® modular platforms feature standard industrial-grade components as well as a fully functional production simulator, all supported by comprehensive academic tools and presented by Yaskawa-certified instructors. Students learn skills needed in today's advanced industries and graduate with the Yaskawa industrial robotic credential in "FS100 Basic Programming with Material Handling".

Contact Hours: 48 hours

Required Text: YASKAWA *FS100 Robot Controller Basic Programming with Material Handling Training Manual*

Required Supplies/Materials: Included in course fee and provided by KTECH.

VR (Virtual Reality) Academy

This computer-based academy provides access to the different stages of the VR development process. Students will learn how to design and program rich 3D virtual reality content using the Oculus Quest VR headset along with the Unreal Engine development kit on Alienware Arora Gaming desktop hardware.

The Academy will expose students to various career paths necessary in building a truly believable immersive world- Audio Engineering, Conceptual Art, Lighting Engineering, 3D Modeling, Texture Artistry, Visual Effects, Animation, Environment Artistry and more.

Equipment

KTECH® utilizes up to date equipment currently found in industry for training our students in Mechatronics, Robotics, and Soldering. This enables KTECH® graduates to make a more seamless transition from the classroom to the workplace.

Mechatronics Bench (87-MSX) - This learning system covers a broad array of applications across a balance of mechanical, electrical, electronics, fluid power and software to enable learners to work effectively in virtually any industrial setting.

FANUC LR Mate 200ID/4S Robot - A FANUC industrial robot integrated with Amatrol's 870-series mechatronics stations contains a module enclosure that includes PLC and FANUC interface cables along with a customized program.

AC/DC Electrical Learning System – T7017A - teaches fundamentals of AC and DC electrical systems used for power and control in industrial, commercial, agricultural, and residential applications.

Programmable Controller Troubleshooting Learning System – 890-PECB - The model 890-PECB Programmable Controller Troubleshooting Learning System teaches programming and troubleshooting of programmable controllers and their use in industrial, commercial, and residential applications.

Mechanical Drives 1 Learning System – 950-ME1 - The model 950-ME1 Mechanical Drives 1 Learning System teaches fundamentals of mechanical transmission systems used in industrial, agricultural, and mobile applications.

Basic Electrical Machines Learning System – 85-MT2 (Electric Motors Workstation) - features a curriculum connecting machine theory with hands-on, real world skill building so that learners can directly apply this knowledge to the operation and installation of electrical motors.

Electric Relay Control Unit – 90-EC1A-XBU- teaches learners how to interpret, design, and operate relay control circuits using ladder diagrams. Electrical control is vital in the operation of electric and fluid power actuators and also forms the fundamental building block of automation systems like programmable logic controllers (PLCs).

Soldering

HAKKO FX-951 Soldering Stations—Compact, high-power but user-friendly soldering iron featuring a soldering tip integrated with heating element and sensor.

Amscope 3.5X-90X Binocular Stereo Boom Microscopes - This binocular 3.5X-90X zoom stereo microscope with fluorescent ring light is an ideal instrument for use in the semiconductor and/or electronic industry.

Robotics

Yaskawa Motoman STEM Platform for Material Handling—The Yaskawa Motoman MHJF STEM Robotics Package is a pre-engineered solution designed for education and training providing hands-on experience with the same equipment used in advanced factories the world over.

Virtual Reality (VR)

Oculus VR (Virtual Reality) Headsets and Alienware Arora Gaming Desktop Computers- are used to deliver fully immersible virtual training content in the areas of Mechatronics, Robotics, Automotive, Manufacturing, Aerospace, Industrial Construction, Hospitality as well as providing the platform to learn and develop VR environments and content .

Tuition and Fees

Mechatronics Lab $3,500

Life Lab is required to be taken in conjunction with the Mechatronics Lab and is therefore included in the tuition.

Solid Edge Lab - Complimentary computer study with Mechatronics enrollment

Soldering Lab

Essentials of Soldering- $1000

Robotics Lab

Robotics Operations and Basic Programming $1500

Special Bundle Deal: $5,500 ($500 discount)

IPC-J-STD-001 Certification TBD (training offered by special request)

Grant Assistance

Kids to Love Foundation— KTECH Grant Assistance

The KTECH program with the Kids to Love Foundation will award grant assistance to qualified students. At this time we do not have any state or federal funding, these needs-based grants are awards given by private donors, companies and foundations who want to help make college education and technical skills possible for every dedicated mind. The grants range from partial tuition up to the full tuition of $5500. The purpose of the grant program is to strengthen our local workforce by providing skills and support to the under-resourced.

KTECH® Mechatronics Admissions Requirements

Potential students will be selected for participation upon the following criteria:

- Must be 18 years or older with high school diploma or GED
- Math capability as measured through ACT (17 Math) , SAT, or another acceptable math assessment. (For Mechatronics and Robotics programs)
- Participation is preferred, but not required, in one or more STEM (Science, Technology, Engineering, Math) focus programs. (For Mechatronics and Robotics programs)
- Preference will also be given to students who have completed career technical programs as well.
- **Must pass a drug test(s) for admission to ALL programs.**
- A waiver for requirements may be issued by the Academic Review Board

How to Apply to KTECH®

Application to the KTECH® Program may be made online via the link at www.goktech.org or by printing and completing the application and mailing it to:

Kids to Love
Attn: KTECH
140 Castle Drive
Madison, AL 35758

To complete the application process, contact your high school and or college and request the following be sent via mail to the Kids to Love Center, 140 Castle Drive, Madison, AL 35758.

- Official high school and or college transcript(s)
- Copy of most current standardized test scores (i.e. ACT PLAN, SAT, PSAT, ASVAB)

KTECH®

A WORKFORCE INITIATIVE OF KIDS to LOVE®

CONNECTING

STUDENTS TO JOBS

- ROBOTICS
- MECHATRONICS
- SOLDERING
- VIRTUAL REALITY

goktech.org