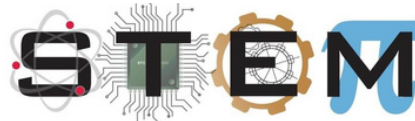




Empowering Minds & Nurturing Values

Where Knowledge meets Righteousness




Scientists • Technicians • Engineers • Mathemagicians



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Introduction



At Worcester Institute of Technology (WIT), our vision is to eradicate "Stone-Age Academics" by bridging the technological divide between affluent and marginalized communities. We aim to leverage pioneering advancements of the Fourth Industrial Revolution (4IR) to ensure equitable access to modern education and resources across Africa. Our approach to learning is rooted in practical, project-based curricula that emphasize hands-on experience and real-world applications. Students engage in collaborative projects that integrate theoretical knowledge with practical skills, fostering creativity, problem-solving, and critical thinking. We prioritize experiential learning through labs, workshops, and industry partnerships, allowing students to tackle real challenges and develop innovative solutions



Institute Overview



➤ Our Approach

WIT's approach centres on collaboration, working closely with local universities and educational institutions to deliver innovative programs and initiatives. With a strong foothold in Southern Africa, WIT is expanding its reach, with proposed mega events slated for Malawi and Nigeria in late 2024

Through its comprehensive programs and strategic partnerships, WIT aims to empower individuals, communities, and nations to thrive in the digital age, ensuring that every child, regardless of background, has the opportunity to realize their full potential and contribute meaningfully to society and thus bringing Africa to its Ultimate Glory



2024

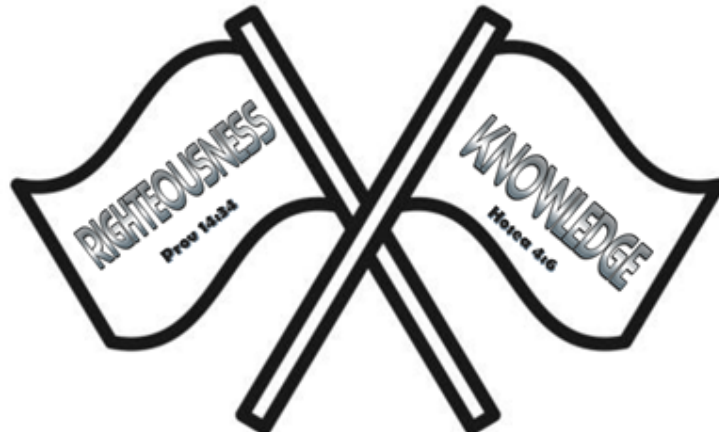
➤ Mission

At Worcester Institute of Technology (WIT), our approach to learning is rooted in practical, project-based curricula that emphasize hands-on experience and real-world applications. Students engage in collaborative projects that integrate theoretical knowledge with practical skills, fostering creativity, problem-solving, and critical thinking.

We prioritize experiential learning through labs, workshops, and industry partnerships, allowing students to tackle real challenges and develop innovative solutions. Our programs are designed to be dynamic and adaptive, incorporating the latest technological advancements and industry trends. This approach ensures that our graduates are well-equipped with the skills and knowledge needed to excel in their chosen fields



Core Values



➤ Guiding Principles

At the core of WIT's mission are two pillars of focus for national prosperity:

a) Righteousness Exalts a Nation. [Proverbs 14:34]

This serves as a foundation for societal harmony and prosperity, fostering trust, integrity, and moral uprightness among citizens. When righteousness prevails, it cultivates a culture of fairness, justice, and respect for one another, creating a cohesive and resilient nation!!!

b) Knowledge Empowers a Nation. [Hosea 4:6]

This emphasizes the importance of education and understanding in shaping a nation's destiny through the transformative power of learning and wisdom. By prioritizing STEAM education and knowledge acquisition, nations can empower their citizens to make informed decisions, innovate, and drive progress, ultimately leading to societal advancement and prosperity

These guiding principles or legs [Knowledge & Righteousness] underscore WIT's commitment to fostering both ethical values and intellectual excellence



Programs

➤ Academic Enrichment

WIT's STEM Education Programs enhance school curricula by introducing coding and robotics as core subjects. Our initiatives provide comprehensive training and resources to integrate these technologies into classrooms. This curriculum enrichment fosters critical thinking, creativity, and technical skills among students. By embedding STEM education, we prepare students for future innovation and career opportunities.



Curriculum Focus

- Basic Programming Concepts
- Algorithm Design
- Debugging and Problem Solving
- Hardware Components and Sensors
- Robot Assembly and Mechanics
- Control Systems and Automation
- Simulation and Testing
- Project-Based Learning
- Team Collaboration and Communication
- Ethical and Social Implications of Robotics

➤ Professional Development Workshops

Program at WIT equips educators with the skills and knowledge to effectively teach STEM subjects. Through hands-on workshops and comprehensive training sessions, teachers learn to integrate robotics, electronics, and programming into their curricula. This program fosters innovative teaching methods, enhancing student engagement and learning outcomes. WIT supports educators in creating dynamic, STEM-focused learning environments



Strategies Employed

- School Partnerships
- Community Centers
- Online Platforms
- University Collaborations
- Corporate Sponsorships



Programs

➤ Inmate Innovation Initiative

provides inmates with practical STEM education and hands-on learning experiences. This initiative aims to equip inmates with valuable technical skills in robotics, electronics, and programming, fostering rehabilitation and empowering them for successful reentry into society. By integrating these experiences in correctional facilities, we help inmates develop critical thinking, problem-solving, and innovation skills for self-sustainability after prison



Electronics Engineering



Coding & Programming



Robotics



CADing, Simulation & Design



Graphic Design & Multimedia Skills

➤ NextGen STEM Games

hosts local and international championships, tournaments, STEM fairs, and expos. These events bring together students and educators to showcase their skills in robotics, coding, and engineering. Participants compete, collaborate, and learn, fostering a global community of future innovators. Our fest highlights the best in STEM education, inspiring excellence and creativity.





Programs

Community Outreach Program

provides inmates with practical STEM education and hands-on learning experiences. This initiative aims to equip inmates with valuable technical skills in robotics, electronics, and programming, fostering rehabilitation and empowering them for successful reentry into society. By integrating these experiences in correctional facilities, we help inmates develop critical thinking, problem-solving, and innovation skills for self-sustainability after prison



STEM Clubs



Robotics Teams



Demonstrations & Exhibitions



STEM Initiatives



STEM Outreaches

Career Fairs and Networking Events

Organizing events that connect students and professionals with companies and organizations in the STEM fields, providing job and internship opportunities.



Bootcamps



Industry Exhibitors



Hackathons



STEM Symposiums



Science Expos

Programs

➤ Guest Speaker Series

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Distinguished Lectures



Industry Insights



TED-Style Talks



Panel Discussion



Research Seminars

➤ Advocacy Campaigns

Organizing events that connect students and professionals with companies and organizations in the STEM fields, providing job and internship opportunities.





Courses



Ethical Leadership: Proverbs 14:34 Essentials



This module focuses on building not just good citizens, but individuals of strong character who embody the values of righteousness and integrity as expressed in Proverbs 14:34. It highlights the importance of personal development and ethical behaviour in contributing to a better society

Robotics and Automation



Students learn to design, build, program, and control robots using various platforms and technologies, gaining practical experience in robotics competitions, challenges, and projects. This course covers the principles, theories, and practical applications of robotics and automation systems. Students learn to design, build, program, and control robotic systems to perform tasks in various domains such as manufacturing, healthcare, agriculture, and space exploration. Practical sessions may involve hands-on experience with robotic kits, simulation software, and industrial robots, as well as projects to develop custom robotic solutions for specific applications

Electronics & Circuitry



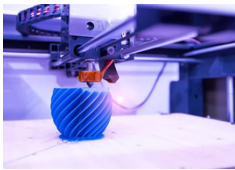
Students learn the fundamentals of electronics and circuit design, including soldering, bread boarding, component selection, and troubleshooting, and apply their knowledge to build circuits and electronic devices

Courses



Programming and software development

Students learn programming languages such as Python, Java, C++, and JavaScript, and develop software applications, games, and simulations, gaining practical experience in coding, debugging, and software engineering principles. This course covers various programming languages, software development methodologies, and tools used in software engineering.



3D printing and prototyping

Students learn to design 3D models using CAD software, prepare models for 3D printing, operate 3D printers, and prototype physical objects and components for various applications, such as product design, engineering, and manufacturing



Augmented reality (AR) and virtual reality (VR) development

Students learn to design and develop immersive AR and VR experiences using platforms such as Unity, Unreal Engine, and ARKit/ARCore, and gain practical experience in creating interactive simulations, games, training modules, and virtual tours



Courses



Engineering design and project management

Modules in engineering design and project management could focus on the design process, problem-solving methodologies, project planning, and teamwork. Students could work on multidisciplinary engineering projects, applying design principles and project management techniques to address real-world challenges and deliver innovative solutions



Drones and aviation

Students learn about drone components, flight dynamics, navigation systems, and regulations governing drone operations, and gain practical experience in drone piloting, mission planning, and aerial photography. Students explore various applications of drones in industries such as agriculture, environmental monitoring, infrastructure inspection, and disaster management, and develop skills in drone-based data collection, analysis, and reporting. Students also learn to design and build custom drones and UAVs (Unmanned Aerial Vehicles) for specific applications, using CAD software, 3D printing, and prototyping techniques, and gain hands-on experience in drone assembly, testing, and optimization.



Cybersecurity and ethical hacking

Students learn about cybersecurity principles, threat detection and prevention, cryptography, network security, and ethical hacking techniques, and gain practical experience in penetration testing, vulnerability assessment, and cybersecurity risk management.

Courses



Artificial intelligence (AI) and machine learning

Students could learn about AI algorithms, neural networks, deep learning, and natural language processing, and gain practical experience in developing AI-powered applications, predictive analytics models, and intelligent systems for automation and decision-making



Graphic design, media, and film editing

This exposes students to the principles of graphic design, including layout, typography, color theory, and visual communication, and apply their knowledge to create digital artworks, logos, posters, and marketing materials. Students learn the fundamentals of media production, including camera operation, lighting techniques, audio recording, and video editing, and develop skills in storytelling, scriptwriting, and narrative structure. Students also learn to edit and manipulate digital video footage using professional editing software such as Adobe Premiere Pro, Final Cut Pro, or DaVinci Resolve, and gain practical experience in color grading, sound design, special effects, and compositing



Internet of Things (IoT) and embedded systems

Students learn to design and develop IoT devices and embedded systems, including sensors, actuators, microcontrollers, and communication protocols, and apply their knowledge to build smart systems and IoT solutions.

PROJECTS

1. MSU & NMU MOU



➤ Institutions

NELSON MANDELA
UNIVERSITY



Proposed Strategy

- Establish a Strategic Framework
- Develop Curriculum and Educational Resources
- Train Educators and Build Capacity
- Infrastructure and Technology Setup
- Launch Awareness and Outreach Programs
- Foster Industry Partnerships
- Monitor, Evaluate, and Scale
- Government and Policy Support

➤ Overview

We are excited to announce the signing of a Memorandum of Understanding (MOU) between Nelson Mandela University in South Africa (NMU) and Midlands State University in Zimbabwe (MSU) brokered by Worcester Institute of Technology. This ground-breaking partnership aims to pioneer the introduction of coding and robotics education in Zimbabwe. By combining the expertise and resources of both institutions, this initiative will create a robust framework for STEM education, providing Zimbabwean students with the skills and knowledge necessary to thrive in the digital age

➤ Outcome

This MOU marks a significant milestone in advancing STEM education in Zimbabwe, particularly in underrepresented and marginalized communities. Through this collaboration, NMU and MSU will spearhead efforts to develop and implement comprehensive coding and robotics programs, including curriculum development and teacher training. Together, we aim to inspire a new generation of innovators and problem solvers, bridging the technology gap and fostering sustainable development in Zimbabwe

PROJECTS

BLANTYRE STEM EXPLOSION



Activities

1. Plastics & Lego Robotics.
2. Engineering Skills & Steel Robotics
3. Coding & Programming Skills.
4. Drones & Aviation
5. BBC Micro:bits
6. Coding Unplugged
7. 3D Printing, Design & Modelling.
8. Virtual & Augmented Reality.
9. Electronics & Arduino.

Proposed Programs

Overview

The First Mega STEM Explosion in Blantyre City, Malawi, is an ambitious and transformative initiative aimed at reaching over 5,000 learners with hands-on robotics and coding education. This ground-breaking event, the First Annual Provincial STEM Fair, seeks to bridge the technology gap in rural and marginalized schools by providing them with access to transformative educational experiences.

1. Training Sessions by Galactic Einsteins Robotics Team:

2. Coaching Sessions:

4. Community Awareness Campaigns:

3. Workshops for educators by coaches from South Africa, Zimbabwe and USA:

5. Sanitary Pad Donation:

Outcome

The program includes a comprehensive two-week series of training sessions, coaching, workshops, and campaigns, all led by our award-winning Galactic Einsteins Robotics Team from South Africa. This initiative aims to provide students with invaluable skills and knowledge in STEM, fostering innovation and bridging educational disparities

PROJECTS



Overview

VEX Robotics engages students in STEM through hands-on, competitive robotics challenges. Designed for ages 8-18, VEX IQ, VEX V5, and VEX AI programs develop critical thinking, teamwork, and engineering skills. VEX Robotics is the world's largest robotics competition, offering students unparalleled opportunities to innovate and excel.

VEX IQ introduces younger students to basic robotics concepts.

VEX V5 offers more advanced engineering and programming challenges for older students.

VEX AI provides cutting-edge, artificial intelligence-based robotics competitions from high school students. At WIT, we are pioneering these programs across Southern Africa. Join us to compete, learn, and grow in a vibrant community of future STEM leaders.

Outcome

The program includes a comprehensive two-week series of training sessions, coaching, workshops, and campaigns, all led by our award-winning Galactic Einsteins Robotics Team from South Africa. This initiative aims to provide students with invaluable skills and knowledge in STEM, fostering innovation and bridging educational disparities

Challenge

Worcester Institute of Technology (WIT) is at the forefront of pioneering VEX Robotics for V5 and VEX IQ in Southern Africa. Our mission is to inspire and prepare the next generation of innovators through hands-on, engaging robotics competitions and educational programs.

VEX V5: Ages 11 - 18



VEX IQ: Ages 8 - 11



PROJECTS

MS4SSA



Objectives

MS4SSA aims to foster regional STEM growth in SADC countries by sourcing second-hand equipment from the USA to Africa, facilitating access to essential resources. The initiative also encourages student exchange programs, enabling learners to gain expertise from advanced institutions abroad, and promotes participation in global competitions, helping students compete and excel on the world stage.

Equipment Shipment from USA



Overview

We are thrilled to announce the collaboration between the MS4SSA (Math and Science for Sub-Saharan Africa) initiative from Worcester Polytechnic Institute (WPI) in Massachusetts. This strategic partnership aims to revolutionize STEM education across Southern Africa by introducing innovative math, science, and technology programs. Leveraging WPI's expertise and resources, the initiative will empower students with critical 21st-century skills necessary for success in a rapidly evolving digital world.

Outcome

The MS4SSA initiative with WPI marks a significant step forward in addressing educational disparities in Sub-Saharan Africa, particularly in underserved and marginalized communities. Through this collaboration, we will develop and implement comprehensive STEM curricula, provide extensive teacher training, and launch impactful educational campaigns. Our goal is to inspire a new generation of innovators and problem solvers, bridging the technology gap and fostering sustainable development across the region



The Galactic Einsteins



Challenge

The Galactic Einsteins Robotics Team at Worcester Institute of Technology (WIT) embodies an inspiring journey of determination and excellence. Originating from the humble beginnings of Zwelethemba Township, these students began their journey learning how to use a computer mouse. Within just one year, with very limited resources, they transformed into national robotics champions



Age Groups

15 - 19 year olds



Team Members

17 team members. 9 girls and 8 boys



Championships

Regionals, Nationals & Internationals

From the Shanties to the World

Their story is a testament to the power of perseverance and innovative thinking. Despite the challenges, the team embraced hands-on learning, collaborating intensively to design, build, and program robots that could compete at the highest levels. This remarkable rise from the slums to becoming a global robotics force showcases their unwavering dedication and passion for STEM, turning what seemed like an impossible dream into an extraordinary reality. The Galactic Einsteins continue to inspire, proving that with grit and the right support, even the most modest beginnings can lead to world-class achievements

International Models

After winning the South African National Robotics Championship, the Galactic Einsteins had the honour of competing in Boston's WPI First Lego League International Open Robotics Championship in USA and the prestigious Maryland Tech Invitational at Johns Hopkins University APL in Baltimore in 2023. These experiences on the international stage have further fuelled their passion and drive. The team is currently working on ground-breaking projects set to be unveiled soon, promising to push the boundaries of robotics and innovation even further.



The Internationals



2022 Midlands Coding Tournament: Zimbabwe

2023 Coding Challenge



Coding Championship. Malawi



Coding Champs. Zimbabwe



Coding Champs: USA



Coding Champs: South Africa

Coding & Robotics In Zimbabwe

Worcester Institute of Technology (WIT) recently hosted its inaugural coding tournament in Gweru, the capital of Midlands Province, Zimbabwe. The successful event saw participation from over 105 students representing 8 local schools. Building on this momentum, WIT has now partnered with Midlands State University (MSU) and Nelson Mandela University (NMU) of South Africa to broaden the STEM education initiative throughout Midlands Province. This collaboration aims to enhance curriculum development and advocate for policy changes to further STEM education in the region.



International Models

In 2023, Worcester Institute of Technology (WIT) hosted the Tangible Africa Coding Championship, marking the first time teams from Zimbabwe, South Africa, Malawi, and the USA participated in such a tournament. Building on this success, WIT is now working to broaden the coding initiative by introducing Microbits for a pilot robotics program in these countries.

Through MS4SSA and other groups, Worcester Institute of Technology (WIT) is developing an exchange strategy to help our learners gain expertise from advanced foreign institutions. We are also planning to host STEM Explosions in Nigeria and Malawi. Additionally, we are introducing VEX Robotics to Southern African countries and working to establish a Robotics Hub for the region.



Key Statistics



Enrollment in Higher Education:

- ✓ Africa: 8%
- ✓ Global Average: 32%



STEM Graduates:

- ✓ Africa: <25%
- ✓ East Asia and the Pacific: 34%
- ✓ Europe and Central Asia: 29%



Global Research Output

- ✓ Africa: <1%

Investing in STEM education in Africa is crucial for fostering economic growth, creating jobs, alleviating poverty, improving health outcomes, and bridging the digital divide. Such investment can empower the continent to meet its development goals and compete globally.



Meet The Team



Our team is made up of 5 directors comprising of expertise in various fields, including engineering, project management, computer information technology, education and theology. We bring a wealth of experience and knowledge to every project.

➤ **Executive Director**



Kuda Takawira

➤ **Programs Director**



Thendo Sinugo

➤ **Technical Director**



Farai Takawira

➤ **Operations Director**



Skhulu Mlobeli

➤ **Financial Director**



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