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STEM Portal

STEM Grant Application Rubric with Samples & Suggestions 2023

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IEEE

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Introduction

This guide is intended to help volunteers submitting a **STEM Grant Proposal** to develop a more effective and impactful proposal. The samples represent previous proposals that received a rating of "4."

- Before entering your information into the submission tool, have all your information nearby. A recommended approach is to write each criteria out in Word and then paste it in. This will give you a chance to review it and adjust.
- Do not exceed the word limit. Provide concise statements.
- Whenever possible provide details. That might include examples, metrics and verifiable background and sources. (*Note – Metrics are especially important in the goals criteria.)
- Ensure your timetable is realistic and has a clear start, end and key tasks and milestones.
- Your budget must include an itemization of expenses.
- Your evaluation plan must include details on what you are measuring and how you will obtain that data. How will know if you are successful?

Good Luck!

Evaluation Rubric Criteria

2023 IEEE Volunteer STEM Portal Grant Evaluation				
	Exceeds - 4	**Meets - 3**	**Approaching - 2**	**Below - 1**
Project Description & Background	The project description is extremely clear and well thought-out. The materials and methods provided in the description are well-organized, student-focused, and appropriate for this grant. .	The project description is clear and fully thought-out. The materials and methods provided in the description are student-focused and appropriate for this grant.	The project description is unclear or not fully thought-out. The materials and methods provided in the description are appropriate for this grant; however organization and student focus may be lacking.	The project description is incomplete. The materials and methods provided in the description are inappropriate for this grant.
Project Goal & Objectives	The project goal and objectives are strong, clear and extremely well stated and include educationally appropriate activities for targeted students or teachers.	The project goals and objectives are clearly defined and include educationally appropriate activities for targeted students or teachers.	The project goals and objectives need to be more clearly defined but does include educationally appropriate activities for targeted students or teachers.	The project goals and objectives are incomplete and do not include educationally appropriate activities for targeted students or teachers.
Timeline & Milestones	The applicant provides a realistic and well-organized timeline for the project which includes objectives, activities and dates.	The applicant provides a workable timeline for the project which includes objectives, activities and dates.	The applicant provides a workable timeline for the project; however, detail is lacking on objectives, activities and dates.	The timeline proposed by the applicant is unrealistic or inappropriate
Program Event Schedule	The applicant provides a realistic and well-organized program event schedule which includes activities date and times.	The applicant provides a workable program event schedule which includes activities date and times.	The applicant provides a workable program event schedule; however, detail is lacking on activities, dates and times.	The program schedule proposed by the applicant is unrealistic or inappropriate
Budget	The applicant provides a detailed and realistic budget for the project.	The budget is appropriate and reasonable for this grant project.	The applicant provides a budget for the project.	The applicant provides a budget for the project, however, some items may not be appropriate or reasonable for this grant project
Evaluation Plan	The applicant provides a clear and reasonable descriptor of how progress toward outcomes will be assessed.	The applicant provides a descriptor of how progress toward outcomes will be assessed.	The applicant is not clear in how outcomes will be measured.	No statement of outcome measure is provided.

Project Description & Background

Application Question: Briefly summarize the proposed project and provide any needed background/history about it.
Word count: 0 / 500

	Exceeds - 4	Meets - 3	Approaching - 2	Below - 1
Project Description & Background	The project description is extremely clear and well thought-out. The materials and methods provided in the description are well-organized, student-focused, and appropriate for this grant.	The project description is clear and fully thought-out. The materials and methods provided in the description are student-focused and appropriate for this grant.	The project description is unclear or not fully thought-out. The materials and methods provided in the description are appropriate for this grant; however organization and student focus may be lacking.	The project description is incomplete. The materials and methods provided in the description are inappropriate for this grant.

See a sample of a “Project Description & Background” that received a 4 rating on next slide.

Sample Project Description & Background

Roboteam is an initiative carried out by volunteers from IEEE Women in Engineering Argentina affinity group, with the purpose of encouraging scientific-technological vocations in children and adolescents through free workshops where they experiment and learn about STEM disciplines, electricity, electronics, energy, programming and robotics. Through our activities we promote socio-economic integration and gender diversity to reduce the digital divide.

- **A clear statement of who they are and their mission.**

According to UNESCO & UNICEF Studies, boys and girls are more vulnerable to the emotional impact of humanitarian and/or health crises like Covid-19 The coronavirus pandemic, in addition to being able to make them sick, profoundly affected their daily lives and their mental health:

- More than 50% showed alterations in their diet, sleep and communication skills
- They miss social contact with their families, peers and teachers

In Argentina there are more than 13 million children and adolescents:

- 65% of kids in 2020, because of the pandemic, were below the line of poverty
- 58% of students had difficulties maintaining attention during virtual classes, while 31% could not sustain a routine related to learning during the pandemic
- 1 in 5 students do not have Internet access at home and 2 in 5 don´t have access to a computer

- **Background based on verifiable data and/or sources**

Sample Project Description & Background (2)

With this framework, and with the objective to support the educational and emotional crisis of this underserved population, we created this program “Roboteam Experiencia STEM” which has the 1st & Summer Edition during January-February-March, with the participation of 45 kids (23 girls & 22 boys) from all over the country.

In this case, we will present a 2nd & Winter Edition of the free STEM Virtual Boot Camp called **“Roboteam Experiencia STEM”** that seeks to encourage scientific-technological vocations in children, using concepts of electricity, electronics and energy, programming and robotics, playful exercises and motivational “soft skills” development activities.

- **History of the program and a strong statement of the project intent.**

It will consist in several on-line workshops with the following topics:

- United Nations Sustainable Development Goals
- Leadership
- Diversity & Inclusion
- Humanitarian Technology
- Engineering, Innovation & Disruptive Technology
- Project Management
- Entrepreneurship - Design Thinking - LEAN Canvas Model - Prototyping
- Hands On STEM Activities for Project Development with Arduino Kits

- **Outline of topics (learning objectives) for the students**

Sample Project Description & Background (3)

With these tools & knowledge, the kids will develop Projects to provide Solutions for social problems into their communities, with a technological approach.

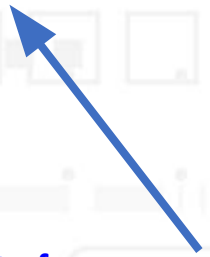
The "Young Tech Social Entrepreneurs" will need to research the problems in their communities, investigate possible and existing solutions and their differences, and came up with an idea. We will ship by courier STEM Arduino kits to each of the participants, to provide them with the materials to prototype their projects. They will receive mentoring from IEEE volunteers and Industry Experts. After the workshops, they will have to present their STEM based ideas and projects and will pitch in front of a Jury that will support them to go from the "idea to action".

It is aimed at children who do not have access to this type of activity. We will select children from underpowering communities from all over Argentina, with the aim of encouraging their curiosity and empowering their self-confidence and change maker spirit.

- **Strong statement of student outcomes and the intended audience**

Key to a strong Project Description:

- **Identify who you are and include the project name**
- **Include background information (include sources if possible)**
- **State the project intent and summarize your expected outcomes**
- **Be concise**
- **End with a strong statement of purpose**
- **Do not exceed the 500-word limit**



Program Goal & Objectives

Application Question

State project goals and objectives. For example, How many particpants willl be engaged?, What knowledge or skills willl the participants be learning?, Will partiipants perceptions or mindsets be changed?, Will partnerships be formed?, Will your local STEM Communtiy grow? Will the underserved gain access to STEM?, etc.
The goals need to be clearly stated and the objectives need to be SMART (specific, measurable, achievable, relevant, and time-bound).
Word count: 0 / 500

See a sample of a “Program Goal & Objectives” that received a 4 rating on next slide.

Sample Project Goals & Objectives

Promote the 17 UN SDGs into Youth. Promote technology as an educational and social integration tool:

- Awaken and encourage technical & scientific vocations as an opportunity for development **-> 45 Girls & Boys from underserved communities will be trained**
- Encourage the creation of technology and its use transversally to build a sustainable future **-> 15 diverse teams (3 kids each) will develop humanitarian technology projects**

Give Response to COVID-19 Educational & Social Crisis and sense of contribution:

- Empowerment & Training for IEEE Volunteers **-> 25 volunteers trained**
- Engagement with IEEE Students, YP, WIE, Senior Members & Nonmembers **-> 25 internal volunteers + 30 externals will be engaged**
- Promotion of IEEE Branding. Industry Engagement & Alliances with other Organizations **-> 20 Organizations will be engaged**

- **Divided goals between External (audience intended to impact) and Internal (IEEE organization)**
- **Well defined goal statements that are measurable**
- **Included metrics**

Program Event Schedule

Application Question: Provide detailed list (including dates and times) of what the participants will be doing during your program. Example: STEM Summit Event Schedule.

	Exceeds - 4	Meets - 3	Approaching - 2	Below - 1
Program Event Schedule	The applicant provides a realistic and well-organized program event schedule which includes activities date and times.	The applicant provides a workable program event schedule which includes activities date and times.	The applicant provides a workable program event schedule; however, detail is lacking on activities, dates and times.	The program schedule proposed by the applicant is unrealistic or inappropriate

See some sample “Program Event Schedules” that received a 4 rating on the next slide.

Sample Program Event Schedules

Program Event Agenda

June 1 4:30-5:30pm - Intro to Circuits - Building circuits out of play doh/Building a Basic Circuit on a Breadboard
June 8 4:30-5:30pm - Intro to Micro:bits & Inputs/Outputs - Hello World & Measuring Light/Using a Photoresistor to Measure Light
June 15 4:30-5:30pm - Variables - Make a Micro:bit Game Scorekeeper
June 22 4:30-5:30pm - Conditionals - Make a Micro:bit Compass
June 29 4:30-5:30pm - Loops - Control a Servo
July 6 4:30-5:30pm - Coordinate Grid System - Custom images on the Micro:bit LED screen/Programming a joystick
July 13 4:30-5:30pm - Measure distance with Ultrasonic Module
July 20 4:30-5:30pm - Build Cutebot Car Kits
July 27 4:30-5:30pm - Communications - Intro to Bluetooth: Drive the Cutebot Cars using the Radio Remote
Aug 3 4:30-5:30pm - Drive the Cutebot Cars using preprogrammed directions
Aug 10 4:30-5:30pm - Wrap up of Summer Session and Final Presentation from Both Groups
Aug 13 1-2pm - Obstacle Course "Race" and Presentation at Elkfest, local community festival

- **Defined start and end (note, dates do not need to be included if they are not yet established – see example to the right)**
- **Well defined tasks, milestones and activities**
- **Realistic schedule based on requirements and available resources**

Program Event Agenda

Six days of Science, Technology, Engineering, and Mathematics immersion program in the form of workshops will be organized. The forum will provide youths access to information and perspective on STEM education. Simultaneously participants will be able to interact with national and international STEM ambassadors. However, the priority of participants will be on experiential learning through the design and development of applications. The resource persons and expertise are not limited to the team members of the workshop, international STEM enthusiasts will be sought to engage and motivate the youths. On completion of the workshop, a theme-based STEM competition will be organized and exhibited.

Event Schedule

Day 1 9:00 AM – 9:30 AM - Welcome Note to STEM Immersion program: Dr Tshewang Lhendup, President, JNEC
9:30 AM – 10:30 AM - Let us Understand STEM, WHY STEM? Why at Grassroots? : Dr Tshewang Lhendup, President, JNEC and National/International STEM enthusiasts will also be invited to deliver motivational insights.
10:30 AM – 11:00 AM - Break
11:00 AM – 12:30 PM - JNEC's Experience on STEM Education promotion 2021: Sangay Chedup, JNEC
12:30 PM – 1:30 PM - Lunch
1:30 PM – 4:30 PM - Introduction to STEM Educational Tools, Implementation of basic automation application experiential based Mentors (Team)

Day 2 9:00 AM – 10:30 AM - Significance of STEM Mentors to Ignite STEM Interest among youths. STEM Mentors Invite experienced national/international STEM Mentors
10:30 AM – 11:00 AM - Break
11:00 AM – 12:30 PM - A paradigm shift in STEM education – IoT, AI, Robotics, Drones, ML, DL, in IR4.0: Sangay Chedup, JNEC STEM mentors Invite experienced national/international experts
12:30 PM – 1:30 PM - Lunch
1:30 PM – 4:30 PM - STEM Immersion: Implement basic applications of Automation, IoT: Guided by Mentors (Team)

Day 3 9:30 AM – 10:30 AM - Let's talk on STEM Outreach: Significance of STEM and Early Access: Invited Talk
11:00 AM – 12:30 PM - UN SDG 4 vs Reality-Digital Divide: Invited talk and mentors/expertise
1:30 PM – 4:30 PM - STEM Immersion: Implementation of Automation, IoT, and AI applications: Mentors

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Day 4 9:30 AM – 10:30 AM - Brainstorming: Creativity, Innovation, Technology: Mentors (in a group)
11:00 AM – 12:30 PM - Computational Thinking and Design Thinking: Ideate, Design: Mentors or Invited talk
1:30 PM – 4:30 PM - Implement the individual idea and Design thinking: Mentors

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Day 5 9:30 AM – 10:30 AM - STEM and Robotics in Schools: Invited Talk and demonstration
11:00 AM – 12:30 AM - STEM for Sustainable Development (e.g. R3-Reuse, Recycle, Remake): Jason Knight Sweden
1:30 PM – 5:00 PM - Learn Robotics Application Development Hands-on: Mentors

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Day 6 9:30 AM – 3:30 PM - Learning by Doing: STEM Immersion to continue: Mentors
3:30 PM – 4:30 PM - Feedback Collection: Mentors

Budget

Application Question:

Please include a breakdown of how the funds will be used (be specific and detailed regarding materials, venue, prizes, marketing, etc.). Up to 25% of the budget may be used for refreshments for participants as a way of motivating participation.

Rubric

	Exceeds - 4	Meets - 3	Approaching - 2	Below - 1
Budget	The applicant provides a detailed and realistic budget for the project.	The budget is appropriate and reasonable for this grant project.	The applicant provides a budget for the project.	The applicant provides a budget for the project, however, some items may not be appropriate or reasonable for this grant project

See some sample of “Budgets” that received a 4 rating on the next slide.

Sample Budgets

- **Total budget requested should be clear**
- **Each expenditure should be itemized**
- **It is recommended to include the cost pet item/person in the itemization**
- **Ideally the number of participants and if they are working in teams should be clear here so we understand the budget breakdown.**

Amount Requested and Budget (USD)

We have the following expenditure plan for this project.

Project Materials: Project materials such as information brochures, banners, student handouts etc. - USD 500
Venue fees: Audio visual session arrangements and other venue related expenditures - USD 200
Supplies: All project related supplies USD 850
Food for volunteers and project team members: USD 400
Total funds requested: USD 1950

Support from the Bule Hora University: All required internal facilities, and training related staff facilities will be provided by the university through its IEEE Student Branch

Budget

The fund utilization breakdown is below. The fund allocation for each activity is allocated against the number of items, events, or activities planned for the execution of the program.

1. STEMSEL runlinc Inventors Kits with WiFi Chip 15 sets @ USD 70/set = 70*15 = 1050 USD
2. STEM Competition Based Exhibition where participants will be supported with additional materials = 350 USD
3. Rental Charges for the usage of resources in the Immersion Program in five locations 40*5 = 200 USD
4. Promotion and Marketing of STEM Immersion program = 100 * 1 = 100 USD
5. Logistics for the conduct of Dissemination programs (Exhibition, Webinars, Seminar) = 150*2 = 300 USD

Total Fund Proposed = 2000 USD

Budget

Total Request - $979.21

$308 14 Micro:bit v2 Microcontrollers
$279.86 10 Micro:bit Smart Cutebot Kits (Robot Vehicle kit for Micro:bit)
$109.95 1 Raspberry pi 4 Starter Kit
$84.89 3 Micro:bit Sensor Starter Kits with Micro:bit Boards

Evaluation Plan

Application Question:

Provide a plan for assessing the effectiveness of the program. How will you evaluate if you have met your goals and objectives? How will you know if participants learned new skills, gained new knowledge or changed perceptions? How will you be doing participant and facilitator testing, surveying, and/or debriefing?

Rubric

	Exceeds - 4	Meets - 3	Approaching - 2	Below - 1
Evaluation Plan	The applicant provides a clear and reasonable descriptor of how progress toward outcomes will be assessed.	The applicant provides a descriptor of how progress toward outcomes will be assessed.	The applicant is not clear in how outcomes will be measured.	No statement of outcome measure is provided.

See a sample of an “Evaluation Plan” that received a 4 rating on the next slide

Evaluation Plan Samples

The main goal of the Library Embedded Programming Series is to provide participants with a solid foundation of basic electronics and programming skills. Skill development will be assessed through evaluation of students' ability to complete the final project, the building and driving of the micro:bit robotic car with limited help from volunteers.

The secondary goal of exposing students to new areas of technology and fostering positive mindsets toward the fields of science and engineering will be measured by Elkins Public Library staff, who will create and collect surveys including student interest in the program and science and engineering field in general, as well as parent feedback on students' gains in skills and knowledge to measure progress.

A final measure of evaluation for the success of the program will be measured by an increase in student enrollment and in the regularity of attendance by program participants.

Explains that participants will complete a final project to evaluate skills development.

Mindset will be evaluated by survey of students interests.

Notice parent feedback is also collected and considered in measuring progress.

Overall success of program will include metric on growth of program by an increase of student enrollment and student engage will be measured through regular attendance

Acknowledgement

On behalf of Educational Activities and IEEE, thank you for submitting a STEM Grant Proposal and for all you do to inspire the next generation of STEM professionals!