



(Form for the Submission of Proposal)  
**Global e-Learning Program for International Students and Faculties**  
**(IIT-I Global e-Learning Program)**  
**International Relations Office**  
**Indian Institute of Technology Indore**

1	Title of the Global e-Learning Program	<b>Introduction to AI and ML in Cybersecurity for Environmental Data, Critical Infrastructure, and Smart Sustainability Systems</b>
2	Proposed dates and duration of the program	<b>June 22 to 26, 2026</b> <b>5 Days &amp; 9 hours</b>
3	Name of the Course Coordinator(s) (Name, Designation, Department, email, contact number)	<b>Dr. Ashootosh Mandpe</b> <i>Assistant Professor (Grade-I)</i> <i>Department of Civil Engineering</i> <a href="mailto:as_mandpe@iiti.ac.in">as_mandpe@iiti.ac.in</a> +91 7020595976
4	Details of the Course Instructor(s) from IIT Indore (Name, Designation, Department, email, contact number)	<b>Dr. Ashootosh Mandpe</b> <i>Assistant Professor (Grade-I)</i> <i>Department of Civil Engineering</i> <a href="mailto:as_mandpe@iiti.ac.in">as_mandpe@iiti.ac.in</a> +91 7020595976
5	Names of the Proposed invited experts outside IIT Indore (Name, Designation, Department/Institute, email, contact number)	<b>Dr. Padmalochan Bera</b> <i>Associate Professor</i> <i>School of Electrical and Computer Sciences,</i> <i>Indian Institute of Technology Bhubaneswar</i> <a href="mailto:plb@iitbbs.ac.in">plb@iitbbs.ac.in</a> +91 674-713-5736
6	Details and Modules of the program (Lectures and Tutorials)	<b>Module 1 – 1 Hour</b> <b><i>Environmental Data &amp; Smart Sustainability Systems: Why Cybersecurity Matters</i></b> <b>Lecture (1 hour):</b> <ul style="list-style-type: none"> <li>• What is environmental data? (air, water, waste, climate, energy) <ul style="list-style-type: none"> <li>✓ What are smart sustainability systems?</li> <li>✓ Smart water systems</li> <li>✓ Smart waste bins</li> <li>✓ Smart grids, solar/wind monitoring</li> </ul> </li> <li>• How these systems can be attacked <ul style="list-style-type: none"> <li>✓ Sensor tampering</li> <li>✓ Data manipulation</li> <li>✓ Remote hacking of pumps/valves</li> </ul> </li> </ul>



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	<ul style="list-style-type: none"><li>• Why AI/ML helps detect problems quickly</li></ul> <p><b>Module 2 – 1 Hour</b> <b><i>Introduction to AI &amp; ML</i></b></p> <ul style="list-style-type: none"><li>• What is AI? What is ML?</li><li>• How ML “learns” using examples</li><li>• Why ML is useful in environmental cybersecurity</li></ul> <p><b>Tutorials 01</b></p> <ul style="list-style-type: none"><li>• Explore simple environmental datasets</li><li>• Identify strange or incorrect data patterns</li></ul> <p><b>Module 3 – 1 Hour</b> <b><i>Basics of Cybersecurity for Environmental Systems</i></b></p> <ul style="list-style-type: none"><li>• Simple explanation of cyber threats</li><li>• How attackers target environmental infrastructure:<ul style="list-style-type: none"><li>✓ Water-treatment SCADA systems</li><li>✓ Smart-meter networks</li><li>✓ Weather stations</li><li>✓ Solar panel IoT modules</li></ul></li><li>• Cyber risks in sustainability technologies</li></ul> <p><b>Module 4 – 1 Hour</b> <b><i>AI/ML for Detecting Anomalies in Environmental Data</i></b></p> <ul style="list-style-type: none"><li>• What is an anomaly?<ul style="list-style-type: none"><li>✓ Sensor offline</li><li>✓ Incorrect readings</li><li>✓ Sudden drop/spike caused by tampering</li></ul></li><li>• How ML can detect anomalies with simple logic</li><li>• Real examples:<ul style="list-style-type: none"><li>✓ Air quality sensor manipulation</li><li>✓ Water pH/flow data inconsistencies</li><li>✓ Solar panel output tampering</li><li>✓ Use of AI for early warning systems</li></ul></li></ul>
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	<p><b>Tutorials 02</b></p> <ul style="list-style-type: none"><li>• Detect anomalies in sample datasets using free tools</li><li>• Interactive graphing to spot suspicious behaviour</li></ul> <p><b>Module 5 – 1 Hour</b> <b><i>Cybersecurity for Critical Environmental Infrastructure</i></b></p> <ul style="list-style-type: none"><li>• What is critical infrastructure? (water, waste, energy, environment)</li><li>• How attackers disrupt:<ul style="list-style-type: none"><li>✓ Water pumping stations</li><li>✓ Smart irrigation networks</li><li>✓ Power/solar grids</li></ul></li><li>• How AI helps:<ul style="list-style-type: none"><li>✓ Monitoring real-time signals</li><li>✓ Identifying unusual device behaviour</li><li>✓ Predicting threats</li></ul></li></ul> <p><b>Module 6 – 1 Hour</b> <b><i>Future of AI in Securing Environmental and Sustainability Systems</i></b></p> <ul style="list-style-type: none"><li>• AI for climate &amp; disaster cybersecurity</li><li>• Secure digital twins for environmental systems</li><li>• ML for environmental forensics</li><li>• Ethical and safe use of AI</li><li>• Careers and future learning paths</li></ul> <p><b>Tutorials 03</b> Mini-project: Choose one topic:</p> <ul style="list-style-type: none"><li>• Create a simple anomaly detection report</li><li>• Suggest AI-based protections for a smart environmental system</li><li>• Explain a cyberattack scenario in simple terms</li></ul>
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7	Target groups (UG/PG/Ph.D. Students or Faculties)	UG, PG and Ph.D. and Faculties
8	Pre-Requisites and Minimum Education Qualification (if any)	<ul style="list-style-type: none"><li>• Basic computer literacy (internet use, file handling).</li><li>• Students having no prior knowledge of AI, ML, or cybersecurity are most welcome.</li><li>• Suitable for students with minimum 12th-grade education.</li><li>• Open to UG, PG, PhD students, faculty members, and early-career professionals from any discipline.</li></ul>
6	How will this program benefit the participants? (in bullet points)	<ul style="list-style-type: none"><li>• Understand the basics of AI, ML, and cybersecurity in simple terms.</li><li>• Learn how cyber threats affect environmental data and smart systems.</li><li>• Gain skills to spot unusual or suspicious patterns in environmental datasets.</li><li>• Build confidence using beginner-friendly AI/ML tools without prior knowledge of coding.</li><li>• Strengthen awareness of digital safety for modern environmental technologies.</li><li>• Prepare for advanced study or careers in AI, cybersecurity, and sustainability.</li></ul>
<b>Submitted by</b>  <b>(31/12/2025)</b> (Signature and Date) Course Coordinator(s)		<b>Approval and Remarks</b>  (Signature and Date) Dean, International Relations, IIT Indore