ERC 2025 Rules – Summary Presentation

COMPREHENSIVE OVERVIEW OF EUROPEAN ROVER CHALLENGE RULEBOOK

Overview

- The European Rover Challenge (ERC) is one of the world's leading planetary robotics competitions
- University teams design and build Mars-analog rovers and support drones
- Tasks simulate real planetary exploration missions aligned with international space robotics roadmaps
- ERC 2025 will be held at **AGH University of Science and Technology, Kraków, Poland**
- The challenge blends engineering design, science, autonomy, and field performance

Main Milestones

- **Kick-Off & Registration:**
  Submission of registration forms + proposal
- **Preliminary Design Review (PDR):**
  Delivery of Preliminary Report + initial RF Form
- **Qualification Phase:**
  Teams selected based on documentation scoring
- **Critical Design Review (CDR):**
  Submission of Final Report, Final RF Form & Science Planning Report
- **ERC Finals (Field Trials):**
  On-site task execution on the Mars Yard + Presentation Task

Required Deliverables

Teams must submit high-quality technical documentation:

- **Proposal** (submitted at registration)
- **Preliminary Design Report + RF Form**
- **Final Design Report + Updated RF Form**
- **Video Demonstration** (10 minutes max)
- **Science Planning Report** (based on Mars Yard 3D model & drone data)
- **Droning Sub-Task Report**
- **Scientific Exploration Final Report** (submitted after the task)
- **AstroBio Final Report** (time-critical submission)
- **Presentation File** for judging panel

Late submissions incur penalties up to 20% deduction per time unit.

Tasks Overview

- ERC 2025 includes **five main tasks**, each with multiple sub-tasks:
- **1) Science Task**
  - Scientific Exploration
  - Surface Sampling (regolith + rock)
  - Deep Sampling (core drilling)
  - Astro-Bio (biological markers & environmental readings)
- **2) Navigation Task**
  - Autonomous Traverse
  - Droning Sub-Task (aerial reconnaissance, probe detection)
- **3) Maintenance Task**
  - Precision manipulation on a malfunctioning panel/device.
- **4) Probing Task**
  - Retrieval of environmental probes left by earlier missions.
- **5) Presentation Task**
  - Professional mission-style scientific/technical presentation.

Technical Requirements

- Rovers and drones must satisfy **Appendix 3 – Requirements** (mechanical, electrical, and safety).
- Communication must use **approved frequencies** (2.4 GHz Wi-Fi, 5 GHz bands, amateur radio bands, etc.).
- **RF Check** is **mandatory** before competing.
- Drone operations must occur inside the official droning cage.
- Teams must follow all safety rules:
  Non-compliance may lead to disqualification.

Communication Regulations

- Only legal RF frequencies permitted.
- Teams must submit accurate RF Forms and maintain RF compliance.
- Unauthorized configuration changes = –20 points per violation.
- 4G/5G/LTE communication is allowed.
- Interference is possible, teams must design robust systems.

Scoring & Qualification

- Up to **20 teams qualify** + **5 Wild Card slots**.
- Documentation quality has **major impact** on qualification.
- Each task has its own **detailed scoring criteria** (Appendix 2).
- Penalties apply for:
  - Delays
  - Incomplete documentation
  - RF non-compliance
  - Unsafe operations
- **Additional awards** include best-in-task recognition: Science, Navigation, Droning, Maintenance, Probing, and Presentation.