



School of Mechanical Engineering
B. Tech Aerospace Engineering Program

STAR Club

Organizes a workshop on

Sounding Rocket Workshop

CONTENTS

starrocketry.github.io

Supporters



REVA
UNIVERSITY



DAY 1

Session	Covered	Outcomes
1	Basics Part of a rocket, types and classes of rockets, basic definitions and terminologies. Thermodynamic Relations and Nozzle Theory Isentropic relations, Area-velocity, Area-mach number relation, calculate dimensions of a contour and conical nozzle.	Learn basics of rocket propulsion and nozzle theory
2 and 3	Solid Rocket Propulsion and Safety Protocols In Rocketry Open Rocket Importance of CP and CG, Staging OpenMotor Design solid rocket motors (J-Class and M-Class)	Learn the grain structure, regressive burn and other topics related to solid rockets, safety protocols to follow Learn OpenRocket and design your own rocket Design solid motors

DAY 2

Session	Covered	Outcomes
1	Basic PCB designing in KiCad	Learn how to design a basic PCB and get it manufactured
2	Use ESP32 for igniter and as a flight computer	Learn to program an ESP32
3	Rocket motor design using SolidWorks with its FEA and CFD analysis for nozzle using SimScale. Finally slice cad models in Babmu Studio	Learn FEA and CFD for Solid Rocket Motors

DAY 3

LAUNCH!

APPS TO INSTALL

1. OpenRocket: <https://openrocket.info>
2. OpenMotor: <https://github.com/reilleya/openMotor>
3. KiCad: <https://www.kicad.org>
4. Simscale (Create Account): <https://www.simscale.com>
5. SolidWorks (Trial): <https://www.solidworks.com/online-product-trials>
6. Onshape (Create account, use if SW doesn't work): <https://www.onshape.com/de/>
7. VSCode: <https://code.visualstudio.com>
8. PlatformIO: <https://platformio.org>
9. Bambu Studio: <https://bambulab.com/de-de/download/studio>
10. Windows users only: <https://www.silabs.com/software-and-tools/usb-to-uart-bridge-vcp-drivers?tab=downloads> (not required for macOS or UNIX based OS, even if using WSL)

Apart from these there are a lot of software (such as rocketpy) and apps to install related to or useful in rocketry and aerospace a lot of these can be explored and discovered through YouTube (BPS.space and a lot more channels) or the subreddit r/rocketry

LEARN MORE

Past workshop slides conducted by thrustMIT can be found [here](#).

Softwares:

1. Fusion 360: <https://www.autodesk.com/in/education/edu-software/fusion/>
2. Ansys: <https://www.ansys.com/academic/students/>
3. OpenRocket: <https://openrocket.info/downloads.html?vers=23.09#content-macOS/>
4. OpenMotor: <https://github.com/reilleya/openMotor/releases/>
5. Excel sheets: <https://www.nakka-rocketry.net/softw.html/>
6. KiCad: <https://www.kicad.org/download/macos/>
7. Onshape: <https://www.onshape.com/en/>

Learn about rocketry

1. Nakka rocketry: <https://www.nakka-rocketry.net/>
2. MIT Rocketry Team (MIT, USA) : <https://wikis.mit.edu/confluence/display/RocketTeam/MIT+Rocket+Team+Home>
3. thrustMIT: <https://www.thrustmit.in>
4. STAR Team page (under construction, fully functional on april): <https://starrocketry.github.io>
5. Elements of Rocket Propulsion by George P Sutton and Oscar Biblarz
6. Design of Liquid Propellant Rocket Engines by Huzel and Huang: <https://ntrs.nasa.gov/citations/19710019929>
7. Liquid Rocket Motor Resources: <https://www.halfcatrocketry.com>
8. Useful website for motors: <https://www.thrustcurve.org>
9. Bonus: <https://fmhy.net/educational#aerospace-engineering>
10. IREC: <https://www.esrarocket.org/2026irec>

Programming and Micro-controllers:

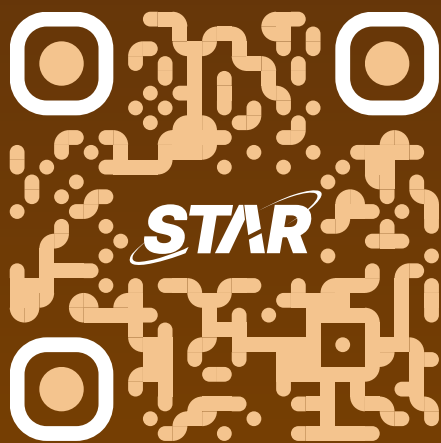
1. Learn about programming: <https://www.freecodecamp.org/learn>, <https://www.w3schools.com>, [Dealing with files](#), [Linux Commands Handbook](#) (for the shell, terminal or command line what ever ya call it. Search for this book on the website)
2. Learn C++: Programming Principles and Practices Using C++ by Bjarne Stroustrup
3. Learn Arduino: <https://docs.arduino.cc/>
4. Learn ESP32: [Docs](#), [Kolban's Book on ESP32](#) by Neil Kolban
5. Google your best friend: <https://google.com>

Electronics:

1. Electronics: <https://ultimateelectronicsbook.com/>, <https://www.ti.com/tool/TINA-TI>, <https://www.allaboutcircuits.com/textbook/>, Open Circuits by Windell Oskay and Eric Schlaepfer, The Art of Electronics by Paul Horowitz and Winfield Hill
2. Learn KiCad: <https://docs.kicad.org> , [KiCad 6 Like A Pro](#) by Peter Dalmaris, (Can't find a component use: <https://www.snapeda.com/>)
3. Get data sheets: <https://octopart.com/>, <https://www.alldatasheet.com/>

Gas Dynamics:

1. Fundamentals of Aerodynamics by John Anderson Jr.
2. Fundamentals Of Gas Dynamics By Robert D. Zucker, Oscar Biblarz



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