Requirements & Constraints

Functional Requirements

- Education website needs provide useful and relevant information to the public
- Provided resources must be applicable and in-use of the ARA project
- Inexperienced users must be able to reflect their learning after being exposed to the educational website

Educational Website, Wireless Network Experiments, and Student's Usability

- The Educational Website will have a collection of well sourced documents and hyperlinks to College Textbooks, Public Domain Educational Visual Media (Videos, PDF's,) a major glossary of Acronyms and Wireless Network jargon definitions.
- Wireless Network Experiments should be engaging and be capable of being performed with little set up time from supervisors. Examples include creating a POWDER account, Setting up a software defined network on an Ubuntu Virtual machine, compiling and running srsRAN, building a local network with routers - network switches – Cat5 ethernet cables, and MAC spoofing.
- Virtual Experiments should also be provided such as following the information from a transport block through the PHY Layer to Antenna Mapping.
- Finally, our resources should be tested by some Engineering Juniors and Seniors in the EE/SE/CPR E/CYB E majors. Their information acquisition time and personal feelings on the resource should be recorded

Resource Requirements

- Dedicated Web-Server on ISU's campus which is up most of the week for deployment testing
- GitLab for providing a shared codebase
- Access to the WICI Laboratories
- 5G Wireless Network Wireless Access Hardware (aka a big part of a UE)
- srsRAN Testing Equipment
- POWDER Server Accounts
- Permission to Reach out and Survey ISU college students (via email)

Physical Requirements

- Reasonably low latency website
- Comfortable viewing on a 12"+ screen
- Incorporates embedded videos for additional assisted learning
- Any information quoted or referenced must be cited for credibility purposes

Aesthetic Requirements

- Website must be structured in a way that promotes ease of learning (i.e. incorporations of many graphics and attempts to avoid long text)
- Website used to host documentation and experimental practices must be user friendly in terms of user-interface design
- Dates on all information must be provided

UI Requirements

- Looks good for the colorblind fellas
- Accessible Homepage with collapsible dropdown menu. Menu contains labels which redirect to more specific information
- Should place emphasis on key topics
- Vocabulary words and key ideas should have the same style and highlighting
- We should make a style guide
- Here is a preliminary list of topics to be included:
    - MAC, RLC, PDCP
    - MAC Experiments
    - PHY Layer
    - PHY Experiments
    - PHY Layer Quiz
    - Glossary
    - Acronym Glossary

Economic/Market Requirements

- No more than 10 hours of work per member per week
- Must be completed by April 14, 2023 (so within 5 months)
- Website must continue to be up post completion of project

2.4   Engineering Standards

3GPP
3GPP is the collection of standards organizations which are responsible for developing protocols and guidelines for mobile telecommunications such as 3G, 4G, and 5G. ARA is focused on providing rural areas 5G network access and thus would follow the 3GPP engineering standard.

IEEE:
IEEE is a standards association which ensures balance, openness, fair procedures and more among a broad range of industries. Our project oversees the process of utilizing many different kinds of electronics, electronic equipment, and methods of data analysis, each of which is governed by the previously mentioned standards. These standards are also enforced among the different companies that are invested with the project.

RoHS:
The Restriction of Hazardous Substances Directive, adopted by the European Union, restricts the use of specified chemicals for use in electronics and electrical equipment. Our senior design will be utilizing electrical and electronic equipment and must adhere to this standard if the product was to be implemented in the EU.

ISO/IEC/IEEE 23026:2015:
Defines the requirements for the life cycle of websites which promotes the usability of informational websites, ease of locating relevant and timely information, and informs users of practices for consistent and efficient web development.