Core SWE Skills for ASE Students

Essential Tools for Modern App Development

SWE Tools Level 1 (Introductory)

In 200-level ASE courses, ASE students are expected to have basic familiarity with:

- **SWE Tools**
- **Documentation Formats**
- **Programming Languages**

Visit https://github.com/nkuase/ASE and choose "SWE Tools L1" for detailed guide.

🛠️ SWE Tools

- **VSCode** – Code editing and extensions

- **Git & GitHub** – Version control and collaboration

- **Linux CLI Tools** – Command-line efficiency and automation

📄 Documentation Formats

- **Markdown** – Lightweight text formatting for docs and READMEs
    - **Marp** - Presentation
- **JSON** – Structured data for configuration and APIs
- **YAML/TOML** – Human-readable configuration and data serialization

💻 Programming Languages

- **Java / JVM** – Standard for software engineering

- **Python** – AI, data science, and automation

- **JavaScript** – Web development and interactivity

Level 2 (Project)

In 300/400 level ASE courses, students are expected to have basic familiarity with:

- **Team Tools**
- **Project Tools**

Don't Worry

- It is OK fine if you're not familiar with these tools **yet**

- Jump in and start using them for your projects

- They're just problem-solving tools

- With practices, you'll master these — and more — faster than you think

However

- Learn to **install** and **use** these tools on your own
- Independent mastery of tools is essential for a software engineering career
- ASE courses won't cover tools in depth, but will provide basic instructions and guidelines

The Good News

- Many high-quality YouTube tutorials are available

- AI/LLM tools are often helpful (but not always accurate due to hallucinations)

- Share error messages with AI tools — they can guide you toward solutions
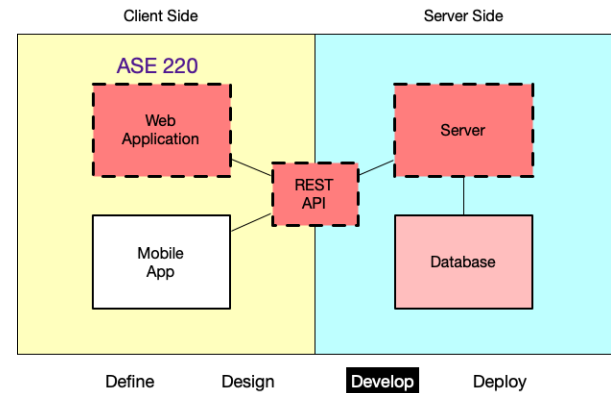
ASE Courses and SWE Tools

Notice: This list is a guideline; you will use more tools in ASE courses and beyond.

Remember: ASE students are expected to master all these tools (and more) before entering real-world software engineering.

- Tools **in bold** are essential and will be used in the course

- Tools *in italics* are optional or may be discussed

ASE 220 (API-Client-Server Focus)

- **JavaScript**/CSS/HTML

- **NodeJS/MongoDB**
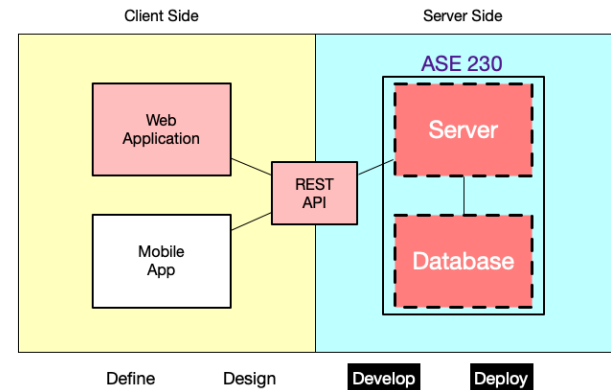
ASE 230 (Server-Side Focus)

- **PHP** & **MySQL**

REST API Tools:

- **Curl**

- JavaScript/HTML/CSS

Optional:

- *Docker* for Deployment

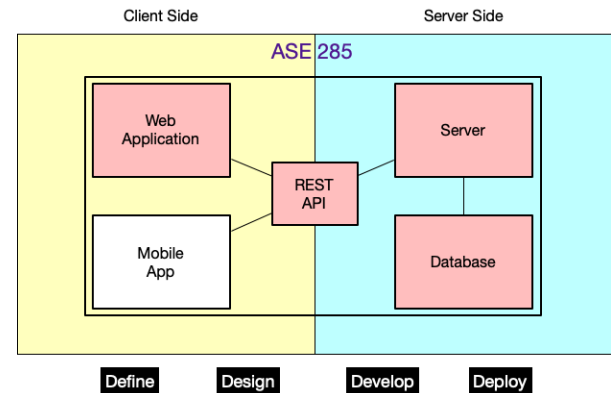# ASE 285 (SWE & Security Focus)

Programming Language:

- **Node.js**, *React*, *TypeScript*

Database:

- **MongoDB**

Security:

- **PGP**, **SSH**
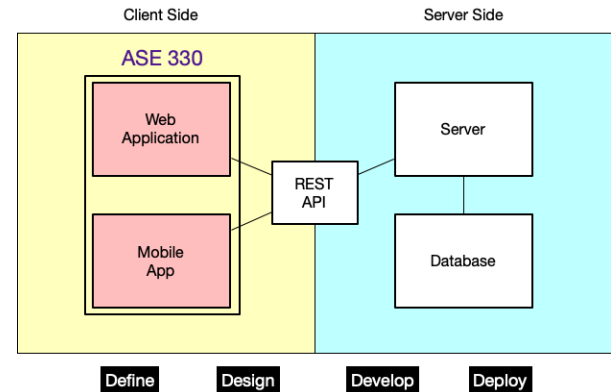
ASE 330 (UI/UX Focus)
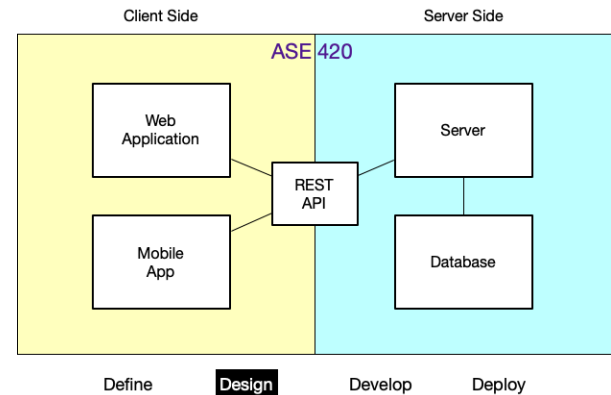
Product Design Tools

- Customer persona

- KANO Model

- SCAMPER technique

- TRIZ framework

ASE 420 (Software Design Focus)

Python

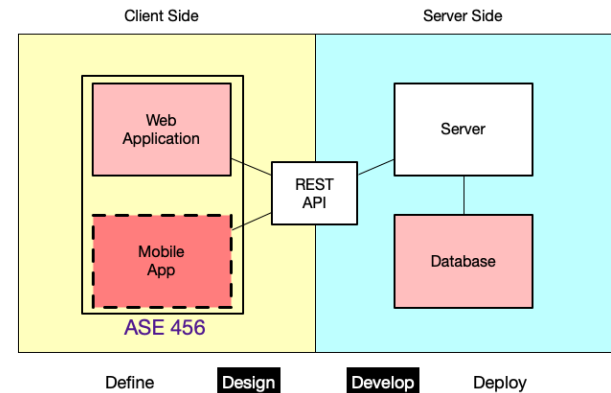- Virtual environments

- PIP

- UV/UXR

- PyTest

ASE 456 (Crossplatform Focus)

- **Flutter/Dart**

- Databases: **PocketBase**, **Firebase**, SQLite, IndexedDB

Optional:

- *Electron*

- *React Native*

ASE 485 (Capstone)

- Client/server programming

- Database programming

- Cross-platform development

- UX/UI tools

- Documentation tools

- Deployment tools