

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

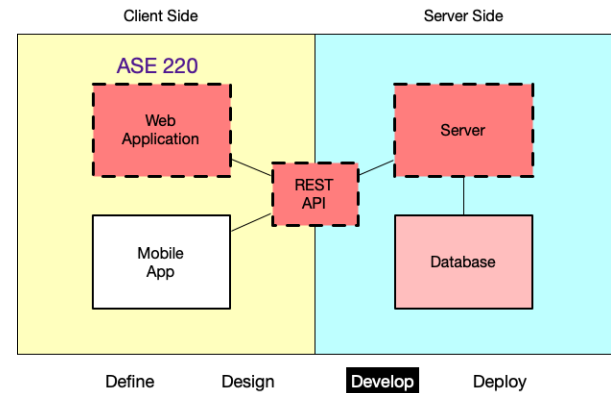
Notice: This list is a guideline; you will use more tools in ASE courses and beyond.

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)

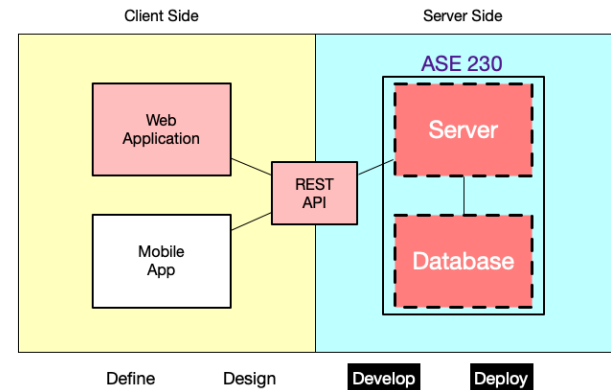
- PHP & MySQL

REST API Tools:

- Curl
- JavaScript/HTML/CSS

Optional:

- *Docker* for Deployment



ASE 285 (SWE & Security Focus)

Programming Language:

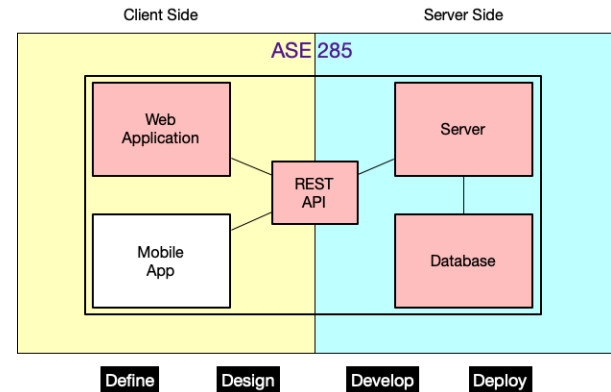
- **Node.js, React, TypeScript**

Database:

- **MongoDB**

Security:

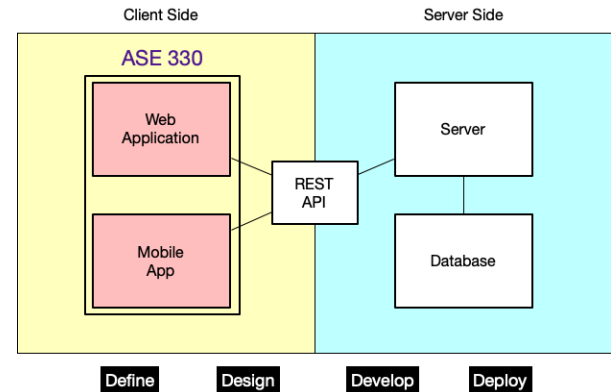
- **PGP, SSH**



ASE 330 (UI/UX Focus)

Product Design Tools

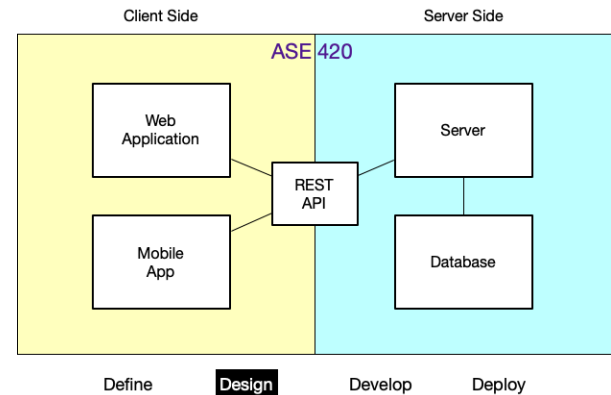
- Customer persona
- KANO Model
- SCAMPER technique
- TRIZ framework



ASE 420 (Software Design Focus)

Python

- Virtual environments
- PIP
- UV/UXR
- PyTest

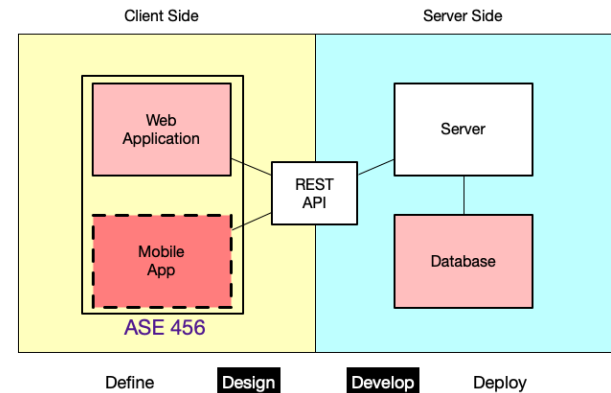


ASE 456 (Crossplatform Focus)

- 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

