4-Month Roadmap to Become a Senior Front-End Engineer (Without Frameworks)

This plan is designed to prepare you for a Senior Front-End Engineer role by focusing on core JavaScript, low-level browser and system knowledge, and building a video group calling app using only vanilla JavaScript.

Month 1: Core JavaScript Mastery + Coding Practice

Goals:

* Become fluent in JavaScript internals
* Practice algorithmic thinking
* Understand the language at memory level

Weekly Breakdown:

- Week 1: Scope, Closures, Hoisting, `this`. Practice: implement bind/call/apply manually
- Week 2: Prototypes, Inheritance, Object.create. Event Loop, Micro/Macrotasks, Promises
- Week 3: Async/Await, debounce/throttle, modules. Implement mini Promise, throttle
- Week 4: Memory leaks, GC, ES6+ features. Start solving JS-specific DSA problems

Deliverables:

> Mini JS utilities repo (`debounce`, `throttle`, `cloneDeep`, etc.)
> 20+ LeetCode/Easy-Medium problems
> Blog: 'Why closures and `this` matter in real-world JS'

Month 2: Browser Internals + Security + Start Video App

Goals:

* Learn how browsers work behind the scenes

* Understand security concepts

* Start planning the video app

Weekly Breakdown:

- Week 1: DOM, Shadow DOM, Render cycle. Chrome DevTools performance tab

- Week 2: CORS, CSP, XSS, CSRF. Storage: cookies, local/session, security

- Week 3: WebSockets, WebRTC theory, ICE candidates, STUN/TURN. Design the video app UI/UX

- Week 4: Build signaling server using Node.js + WebSocket. Room & peer connection logic

Deliverables:

> WebSocket-based signaling server (Node.js)

> Design doc: architecture of your video app

> Blog: 'Browser rendering deep dive for JS devs'

Month 3: Build the Group Video Calling App

Goals:

* Fully implement the video group calling app

* Add key features and polish UX

Weekly Breakdown:

- Week 1: Get user media, create RTCPeerConnection. Join/leave room via WebSocket

- Week 2: Handle group connections (mesh network). Add mute/unmute, camera toggle

- Week 3: Add screen sharing, chat. Handle disconnections, reconnect logic

- Week 4: Polish UI (CSS-only). Optimize video resolution & bandwidth usage

Deliverables:

> Working group video chat app (GitHub)

> Readme with diagrams and setup

> Demo video + architecture explanation

Month 4: System Design, Interview Prep, & Polish Portfolio

Goals:

* Be ready for interviews

* Build proof of senior-level thinking

Weekly Breakdown:

- Week 1: Frontend System Design: component patterns, pub-sub, lazy loading

- Week 2: Performance: paint-blocking analysis, Web Vitals, memory profiling

- Week 3: Mock interviews (code + system design). Refactor video app to use modules

- Week 4: Final polish on portfolio: blog, GitHub, resume, README. Apply to jobs and start interviews

Deliverables:

> Updated Resume + Portfolio site

> Blog: 'How I built a WebRTC group call app from scratch'

> Simulated interview logs (behavioral + tech)