# BookswapVIT - Technical & Functional Documentation

**Project Type:** Full-stack Web & Mobile Application  
**Target Audience:** VIT University Students  
**Project Duration:** 4 Weeks (MVP)  
**Team Size:** 4–5 Members

**Primary Goals:**

* Facilitate zero-cost exchange of physical books
* Enable access to handwritten e-books/notes from seniors
* Simplify student-to-student coordination via request-based chat
* Ensure scheduling ease through availability-based filters

# 1. Executive Summary

**Bookswap VIT** is a platform engineered to enable students at Vellore Institute of Technology to **share physical textbooks and handwritten digital notes** freely and effectively.

The system streamlines book/notes discovery, request workflows, and peer-to-peer communication — all within a trusted, authenticated student environment.

The MVP prioritizes speed, simplicity, and a minimalistic user interface.

# 2. Feature Set (All Free-to-User)

1. **VIT-Only Authentication**
   * Free via Firebase Auth or Supabase Auth, restricted to @vitstudent.ac.in emails.
2. **Book & e-Note Listings**
   * Physical books: metadata form.
   * Handwritten e-notes: PDF/image upload to free storage.
3. **Search & Filters**
   * Query by branch, semester, type (book/notes), subject, mutual time-slot.
4. **Request → Approval → Chat**
   * Request flow with status updates.
   * Chat over the platform’s free real-time DB.
5. **Time-Slot Matching**
   * Pick availability in profile; filter matches on listing page.
6. **Exchange Vault**
   * Dashboard summarizing shares/requests; simple “reputation” score.

# 3. Roles & Responsibilities

* **Product Lead / UX**: Finalize flows, wireframes, acceptance criteria.
* **Frontend Dev**: React + Tailwind; integrate with free-tier APIs.
* **Backend Dev**: Firebase Functions or Supabase Edge Functions; DB rules.
* **DevOps / QA**: Setup GitHub Actions; test plans; monitor free-tier quotas.
* **Support / Documentation**: Update README, write user guide, keep post-interview slides.

## 4. Four-Week Sprint Plan

| **Week** | **Goals** | **Deliverables** |
| --- | --- | --- |
| **1** | **Bootstrap & Auth** | • Repo + CI/CD • VIT-domain-restricted signup/login • DB schema & storage setup |
| **2** | **Listings & Search** | • UI for adding books/notes • File uploads to free storage • Basic search & filters |
| **3** | **Requests & Chat** | • Request API + UI • Approval workflow • Real-time chat via free tier realtime DB |
| **4** | **Slots, Vault, Test & Deploy** | • Time-slot picker + filter logic • Exchange Vault dashboard • E2E testing • Prod deploy |

# 5. Tech Stack & Tools

| **Layer** | **Tool / Service** | **Free-Tier Details** |
| --- | --- | --- |
| **Version Control** | **GitHub** (Free tier) | • Unlimited public/private repos • Unlimited collaborators |
| **CI/CD** | **GitHub Actions** | • 2,000 free CI minutes/month • 500 MB artifact storage |
| **Frontend Hosting** | **Vercel** (Hobby) | • Unlimited hobby sites • 1 GB bandwidth/month • Custom domains, previews |
| **UI/UX & Prototyping** | **Lovable** (Free plan) | • Up to 3 active projects • Unlimited collaborators |
| **Backend (Functions & Auth)** | **Firebase** (Spark) | • 125K invocations/day • 10 GB storage • Unlimited users with email/domain whitelist |
| **Alt Backend** | **Supabase** (Free tier) | • 2 GB database • 500 MB file storage • Auth & Realtime |
| **Database** | **Firestore** (Spark) | • 1 GB storage • 50K reads/day, 20K writes/day |
| **File Storage** | **Firebase Storage** (Spark) | • 5 GB total • 1 GB/day downloads |
| **Authentication** | **Firebase Auth** (Spark) | • 10K verifications/month • Email/password + domain restriction |
| **Realtime / Chat** | **Firebase Realtime DB** (Spark) | • 100 MB data storage • 1 GB/month bandwidth |
| **Static Assets** | **Cloudflare Pages** (Free) | • Unlimited sites • 500 GB/month bandwidth |
| **Monitoring** | **Sentry** (Free) + **Google Analytics** | Sentry: 5K errors/mo GA: unlimited hits |
| **Dev Tools** | **VS Code** + **Postman** | Both completely free |
| **Project Mgmt** | **Notion** (Personal Pro Free) | • Unlimited pages & blocks • Unlimited collaborators |

# 6. Deployment & Testing

1. **Previews** via Vercel/Netlify for every PR .
2. **Staging** on the same free tier (separate branch).
3. **Pilot Test** with 10–20 VIT students—collect feedback in a free Notion board.
4. **Production** on custom domain (free if you use Freenom + Cloudflare DNS), or use (bookswapvit.vercel.app).