# Product Requirements Document (PRD)

**Document Version:** 1.0  
**Date:** May 16, 2025  
**Project:** VibeCoding

## 1. Introduction

### 1.1 Purpose

This Product Requirements Document (PRD) outlines the functional and non-functional requirements for the VibeCoding platform. It translates business needs into specific product features and serves as a guide for the development team.

### 1.2 Product Vision

VibeCoding will be an intuitive, collaborative coding platform that enhances developer productivity through AI-assisted coding, real-time collaboration, and intelligent code management tools.

### 1.3 Scope

This document covers the detailed product requirements for VibeCoding, including user stories, functional requirements, non-functional requirements, and constraints.

## 2. User Personas

### 2.1 Primary Personas

* **PR-001**: Alex - Senior Software Engineer who leads development teams
* **PR-002**: Jamie - Mid-level Developer working in a remote-first company
* **PR-003**: Taylor - Engineering Manager overseeing multiple development teams

### 2.2 Secondary Personas

* **PR-004**: Morgan - QA Engineer who needs to review and understand code changes
* **PR-005**: Casey - DevOps Engineer who manages deployment pipelines
* **PR-006**: Riley - Junior Developer learning best practices and team workflows

## 3. Functional Requirements

### 3.1 Code Editor Features

* **PR-007**: Implement a cross-platform code editor with syntax highlighting for at least 15 programming languages
* **PR-008**: Provide intelligent code completion suggestions based on context and project structure
* **PR-009**: Enable customizable code snippets and templates for common patterns
* **PR-010**: Support multiple tabs and split-screen editing

### 3.2 AI-Assisted Development

* **PR-011**: Implement an AI code generator that can suggest code solutions based on natural language descriptions
* **PR-012**: Provide automated code review capabilities that identify potential bugs and performance issues
* **PR-013**: Enable AI-powered documentation generation from code
* **PR-014**: Incorporate learning algorithms that adapt to each user’s coding style and preferences

### 3.3 Collaboration Features

* **PR-015**: Enable real-time collaborative editing with visual indicators of collaborator positions
* **PR-016**: Implement a commenting system that allows inline code discussions
* **PR-017**: Provide pair programming capabilities with shared terminal access
* **PR-018**: Support role-based access controls for different levels of project access

### 3.4 Version Control Integration

* **PR-019**: Integrate with Git, GitHub, GitLab, and Bitbucket
* **PR-020**: Visualize branch structures and merge histories
* **PR-021**: Provide conflict resolution tools with suggested automatic resolutions
* **PR-022**: Enable code review workflows with approval processes

### 3.5 Project Management

* **PR-023**: Implement task tracking linked to code changes
* **PR-024**: Provide burndown charts and velocity tracking for agile development
* **PR-025**: Enable milestone creation and progress visualization
* **PR-026**: Support custom workflow definitions for different team structures

## 4. Non-Functional Requirements

### 4.1 Performance

* **PR-027**: The system shall respond to user interactions within 200ms under normal load
* **PR-028**: The platform shall support at least 50 concurrent users in a single collaborative session
* **PR-029**: Code indexing and search operations shall complete within 5 seconds for projects up to 1GB in size

### 4.2 Security

* **PR-030**: All code transmission shall be encrypted using industry-standard protocols
* **PR-031**: User authentication shall support multi-factor authentication
* **PR-032**: The platform shall comply with GDPR, CCPA, and other relevant data protection regulations
* **PR-033**: Regular security audits shall be conducted on the codebase and infrastructure

### 4.3 Reliability

* **PR-034**: The system shall maintain 99.9% uptime during business hours
* **PR-035**: Automated backup systems shall preserve all user data with recovery point objective of 1 hour
* **PR-036**: The system shall gracefully degrade functionality when network connectivity is limited

### 4.4 Scalability

* **PR-037**: The platform architecture shall accommodate linear scaling to support up to 100,000 users
* **PR-038**: Database design shall optimize for high read/write operations during peak usage
* **PR-039**: Resource allocation shall be dynamically adjusted based on usage patterns

### 4.5 Usability

* **PR-040**: The user interface shall follow modern design principles and accessibility standards
* **PR-041**: First-time users shall be able to set up a project within 5 minutes
* **PR-042**: The platform shall provide comprehensive documentation and contextual help
* **PR-043**: User onboarding shall include interactive tutorials for core features

## 5. Release Planning

### 5.1 MVP Features (Release 1.0)

* **PR-050**: Core code editor with syntax highlighting for 5 most popular languages
* **PR-051**: Basic AI code completion
* **PR-052**: GitHub integration
* **PR-053**: Simple collaborative editing
* **PR-054**: User authentication and project management

### 5.2 Release 2.0

* **PR-055**: Expanded language support
* **PR-056**: Advanced AI features including code generation
* **PR-057**: Additional VCS integrations
* **PR-058**: Enhanced collaboration tools

### 5.3 Future Considerations

* **PR-059**: Mobile-first development experience
* **PR-060**: Enterprise features for large organizations
* **PR-061**: Marketplace for extensions and themes
* **PR-062**: Integrated learning platform

## 6. Acceptance Criteria

### 6.1 Definition of Done

* **PR-063**: All features meet specified functional requirements
* **PR-064**: Code passes automated tests with minimum 90% coverage
* **PR-065**: User documentation is complete and accurate
* **PR-066**: Performance metrics meet or exceed requirements
* **PR-067**: Security vulnerabilities have been addressed

## 7. Approval

This Product Requirements Document requires approval from:

* Product Manager
* Technical Lead
* UX/UI Lead
* QA Lead
* Customer Success Representative