Node.js Developer Cheatsheet

What is Node.js?
Node.js is a JavaScript runtime built on Chrome's V8 engine. It enables server-side JavaScript execution with a non-blocking, event-driven architecture.

Concept	Description
Single-Threaded	Executes JS on one thread but handles I/O asynchronously via event loop.
Event Loop	Continuously listens for and processes asynchronous events.
Non-Blocking I/O	Allows multiple requests without waiting for previous ones to complete.
Modules	Reusable pieces of code imported using require() or import.
Asynchronous	Uses callbacks, promises, and async/await for concurrency.

Express.js Example

```
import express from 'express';
const app = express();
app.get('/', (req, res) => res.send('Hello World'));
app.listen(3000, () => console.log('Server running on port 3000'));
```

Security & Best Practices
• Use Helmet for HTTP header security.
• Never block the event loop.
• Store secrets in environment variables.
• Validate and sanitize all user input.
• Use async/await or Promises instead of nested callbacks.

Scaling Node.js
• Use Clustering to leverage multiple CPU cores.
• Implement Load Balancers (NGINX, HAProxy).
• Use PM2 for process management.
• Split services into microservices.

Summary
Node.js is fast, scalable, and ideal for I/O-heavy apps. Use it with Express, follow async best practices, and scale using clustering and microservices.