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2025

Applicazioni Web I
Web Applications I

Introduction to the course

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Francesca Russo, **Luca Scibetta**

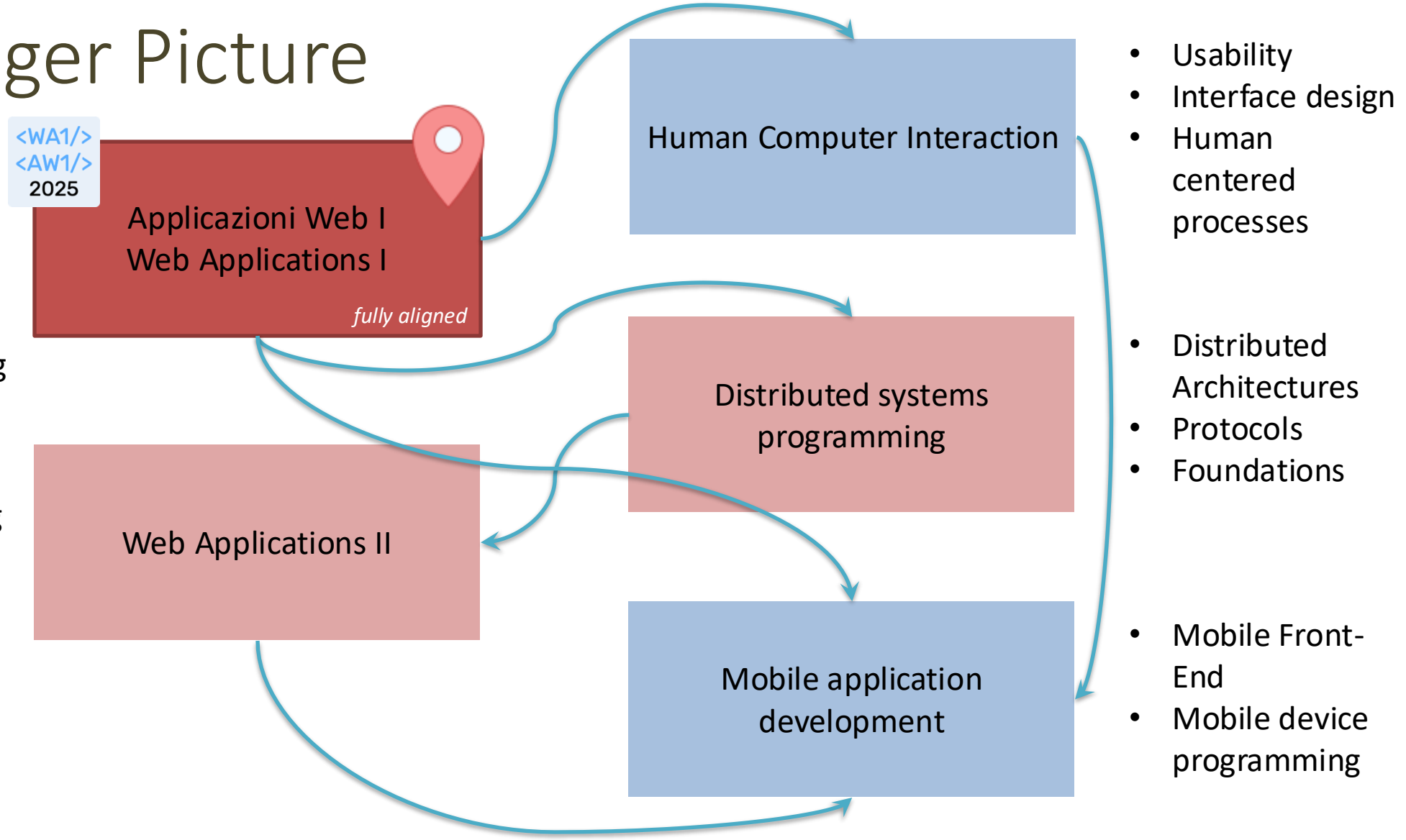
Goal

- Understanding web architectures
- Understanding and mastering web application design and development
- Gaining in-depth knowledge of the JavaScript language and ecosystem
- Becoming familiar with one of the most popular JavaScript frameworks (React)
- …with special focus on the front-end

The Bigger Picture

- Web architecture
- JavaScript
- Browsers
- **Front-End** programming

- **Back-end** programming
- Scalability
- Large-scale



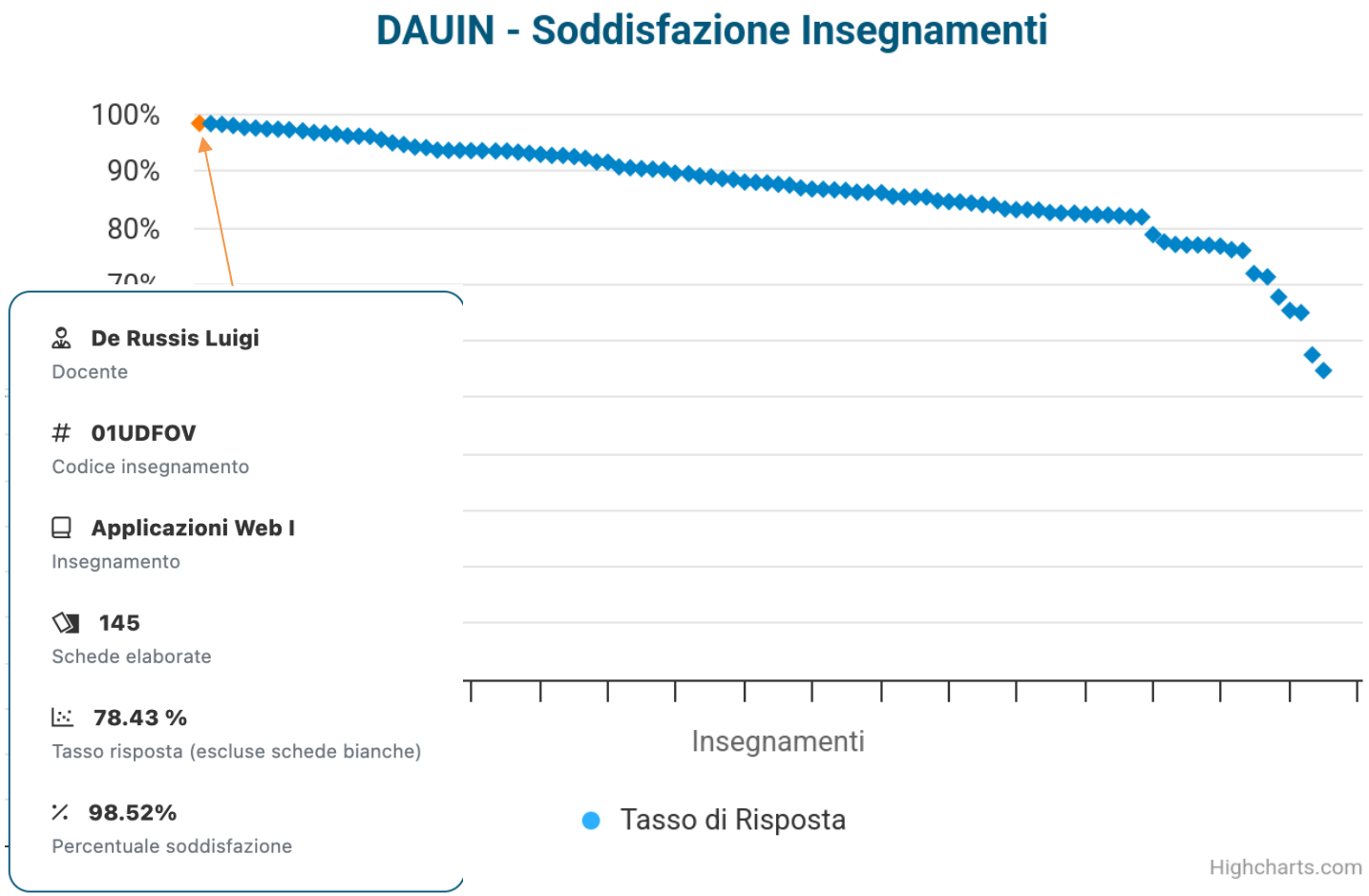
- Usability
- Interface design
- Human centered processes

- Distributed Architectures
- Protocols
- Foundations

- Mobile Front-End
- Mobile device programming

You are here

2024 End-of-course Questionnaire



- Relevant critiques*:
  - Labs should be more structured and supportive
  - Need more time for in-class exercises
  - Not enough time to reason about each topic

** considered in planning this year's course*

What We Will Learn

JavaScript as a language

- ECMAScript ES6
- Language constructs
- In-depth semantics
- Functional, Asynchronous, Modular, …

The browser ecosystem

- HTML, CSS, page structure
- DOM
- Events, Properties, Handlers, APIs

Single Page Applications

- Server-side (bare minimum) with node
- API development
- Backend storage
- Sessions and Authentication

React framework

- Components, Properties, State
- JSX
- Hooks
- Router

Weeks and Calendar… At a Glance!

1. Intro to JS: basics, objects, functions
2. Intro to JS: async programming, callbacks, DB interaction + Intro to Web
3. Server-side with Express
4. HTML, CSS, Bootstrap
5. Intro to React + DOM
6. React: props and state
7. React: context, life cycle, forms
8. React router
9. Fetch and client-server interaction (in React)
10. Authentication

Course Organization

- Classes
  - 3 h/week
  - Lectures + Exercises (*mixed*)
- Laboratories
  - 1.5 h/week
  - 2 Lab groups (see later for the split)
  - Starting 2nd week
- **Exception**: first week
  - Class instead of Lab

	MO	TU	WE	TH	FR
08:30		R4b			
10:00		R4b			
11:30					
13:00					
14:30	3P				
16:00	3P				
17:30					

Classes

- **In person**, in rooms with power outlets at the desks
  - bring your own computer, if possible, to follow the examples/exercises
- **Video-recorded** and made available soon after each class
  - *not* streamed live
- A few times during the course, we will give you some materials to read/watch instead of a lecture (i.e., **readings**)
  - published well *in advance*

Laboratories

- Starting 2nd week
- In rooms with power outlets at the desks

- Build a simple project extracted from recent **Exam assignments**
- In groups of 2-5 students
- **Weekly step-by-step** design and implementation, following the course topics
- Text online, some days in advance

- Support, discussion, help, during the lab sessions
- Attendance to the labs is **highly recommended**

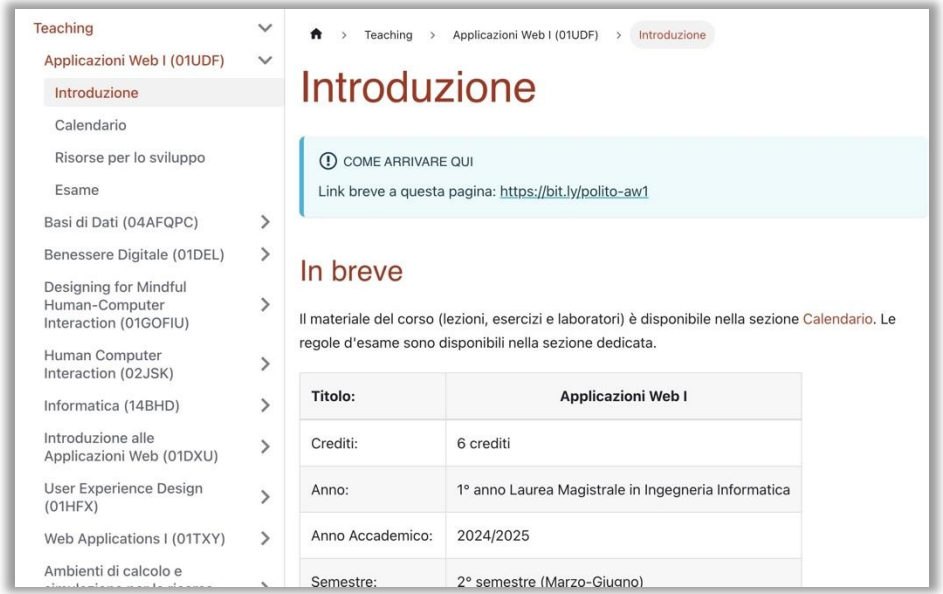
Groups and Laboratories

- 2 slots:
  - Tuesday, 08:30-10:00, room R4b, surnames: A-L
  - Tuesday, 10:00-11:30, room R4b, surnames: M-Z

- Groups to be created within the two slots above
  - People from one slot *can* join a group in another slot, if needed

- Group composition via GitHub Classroom by the end of **March 3, 2025**:
  - https://classroom.github.com/a/BIwZinRv

Learning Material



- Course website – https://bit.ly/polito-aw1
  - Slides (in English)
  - Full schedule
  - Links and supplementary material
- Video lectures (screencasts)
  - YouTube - https://youtube.com/playlist?list=PLs7DWGc_wmwQoZtq-xf4mO4sw9VuZkTd0
  - Portale della Didattica
- GitHub - https://github.com/polito-webapp1
  - Examples, exercises, labs, exams, …

Communications

- We will use **Telegram** for the main communications
  - among students, with teachers, etc.
- Announcements, official information, and Q&A
- Feel free to contact the teachers for feedback and questions
  - questions of general interest must be posted in the group, so that everybody can see the answer
- Link to the Telegram group: https://t.me/+K8wNMKS-Jww3MDM8
- Emails can be an **alternative** for slower, more articulated, and private individual communications

Office Hours

- **Why?**
  - An opportunity to discuss issues or needs
  - To clarify information or ask questions on the course
  - To discuss academic or career goals (e.g., thesis, what to do next year)
  - To know more about certain topics
  - …
- **When?**
  - **Tuesday 15:00-16:00, Thursday 11:30-12:30, Friday 14:00-15:00** in my office; book a 30-min slot at: https://calendly.com/luigi-derussis/office-hours
  - Also: on request, in person or remotely

Exam: Two Parts

1. **Project development** (up to 26 points)
   - Individual
   - Starting from shared requirements
   - 20 days of time
2. **Oral discussion** (up to 4 points)
   - individual and mandatory
   - “live” correction and discussion of the submitted project
   - when: the official exam day (or starting from that day)

Exam: Score and Process

- Project development + oral discussion: up to 30 points
- Up to 2 extra points for students whose projects demonstrate a high quality and for the richness and precision of the answers during the discussion

Note: If it emerges that the student does not have mastery of the written code, the exam will be immediately canceled, without a numerical evaluation.

Full exam rules in the course website (under “Exams”)

Project Development

What

- Develop a web application using
  - React + JavaScript
  - Node + Express
  - SQLite
- According to a functional specification
  - published 20 days before each official exam date

How

- Individually (i.e., not in group)
- Using GitHub Classroom
  - commit + push your project
- Teacher's Evaluation
  - running the application on the teacher’s laptop
  - examining the code

Oral Discussion

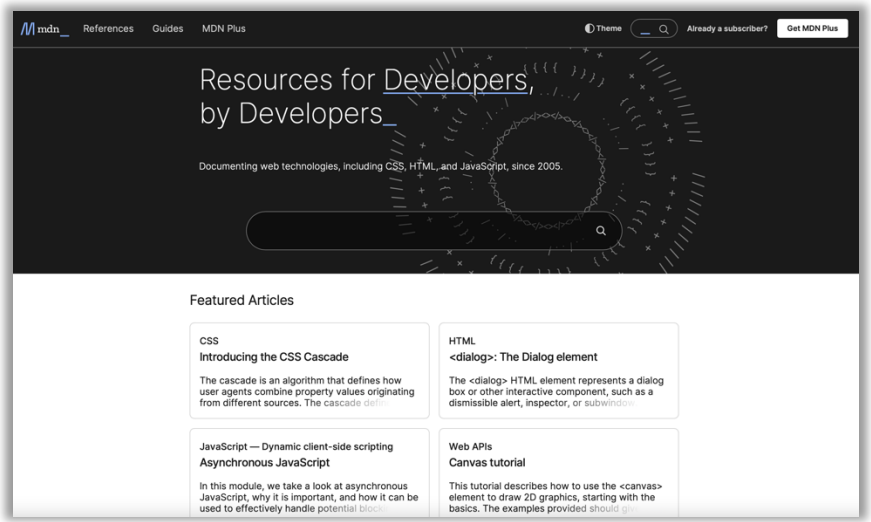
Goals

- To ensure that each student developed the web application by themselves
- To evaluate how much the student can explain the exact behaviour of the code

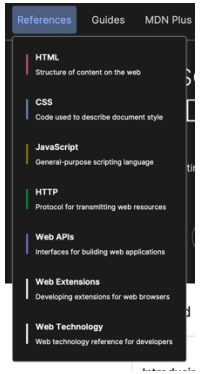
Evaluation Criteria

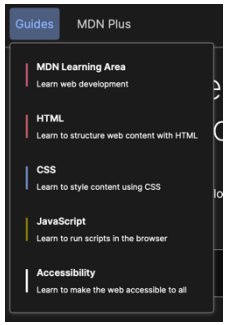
- Theoretical and practical knowledge of the project design
- Theoretical and practical knowledge of the project code base
- Readiness and clarity in the replies

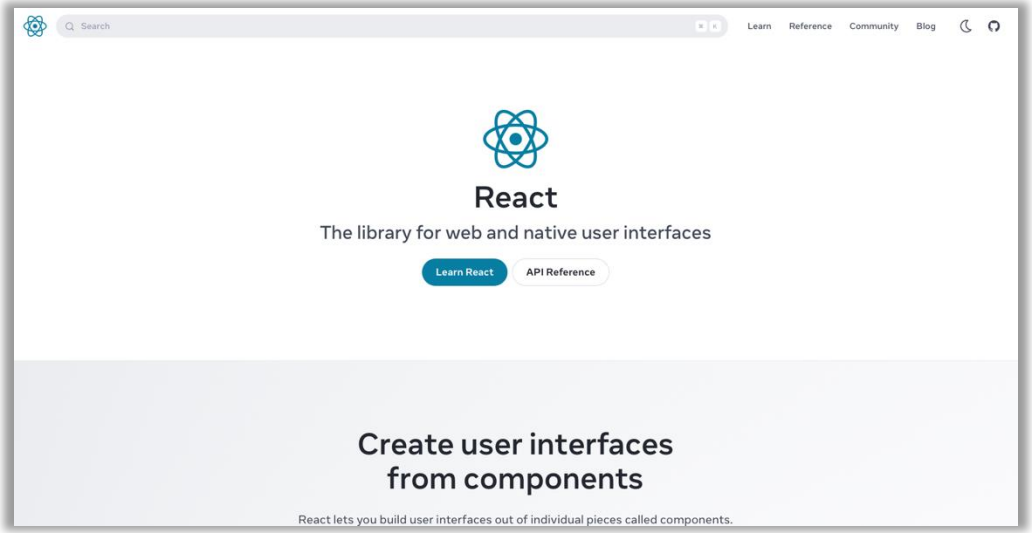
Resources (fundamentals)



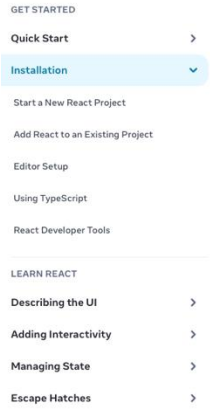
Mozilla Developer Network (**MDN**)
https://developer.mozilla.org/



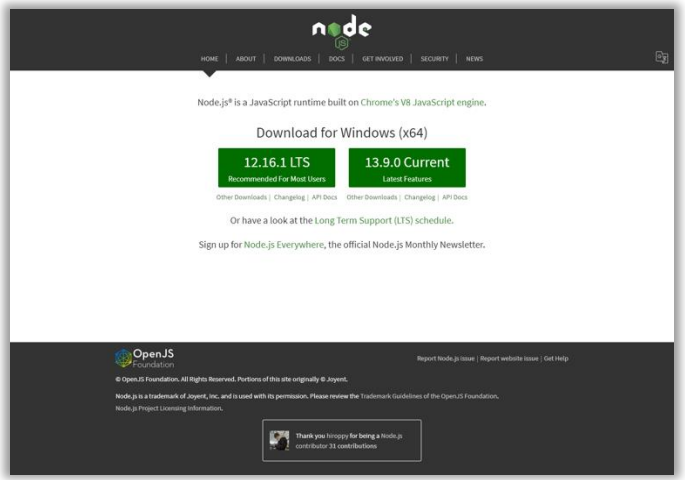




React
https://react.dev



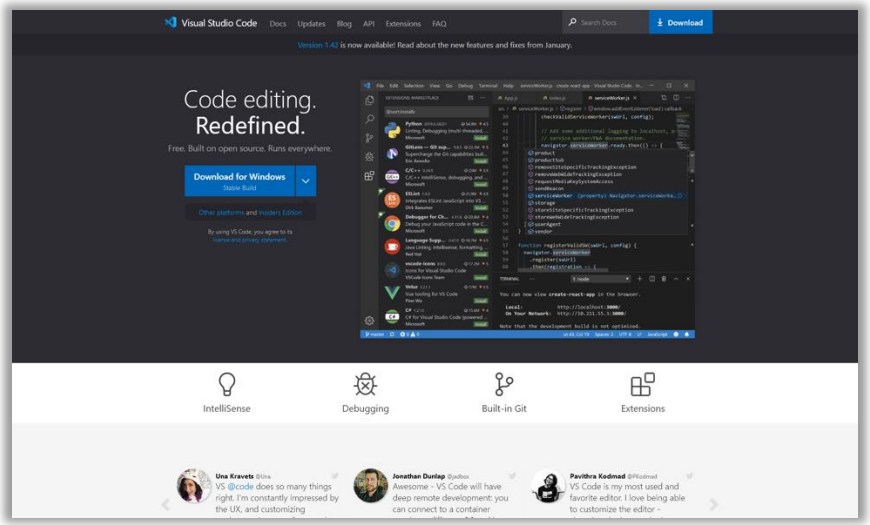
Tools



Node.js runtime
Version 22.x LTS
https://nodejs.org/en/

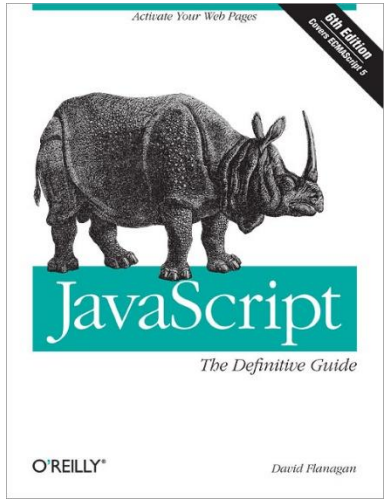
React Developer Tools
Extension for Chrome and Firefox

Programming Environment

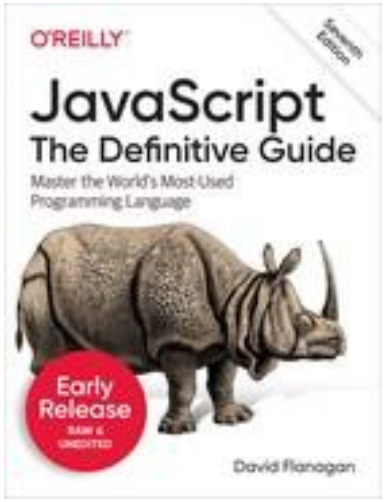


Visual Studio Code
https://code.visualstudio.com/

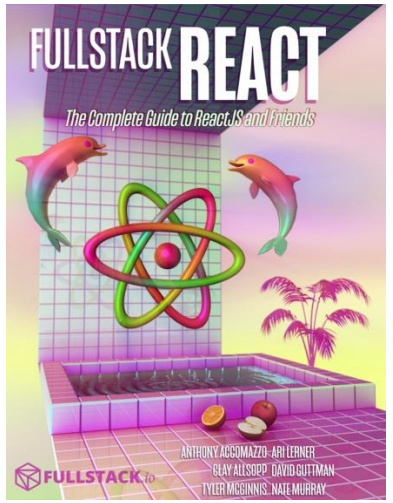
Resources (books)



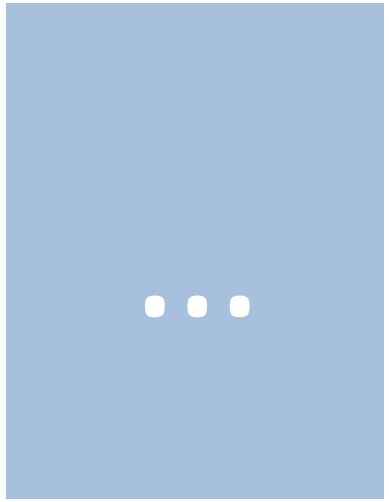
JavaScript: The Definitive Guide, 6th Edition
By David Flanagan
ISBN 978-0596805524
Release Date: May 2011
(not very updated…)



JavaScript: The Definitive Guide, 7th Edition
By David Flanagan
ISBN 978-1491952023
Release Date: July 2020

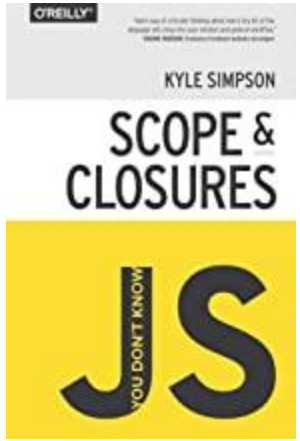


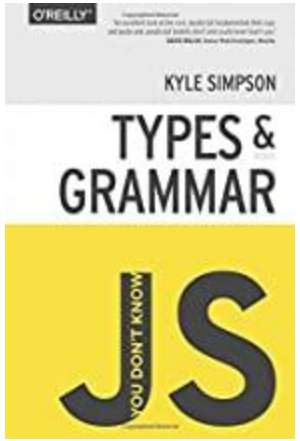
Fullstack React
By Anthony Accomazzo, Nate Murray, Ari Lerner, Clay Allsopp, David Guttman, and Tyler McGinnis
https://www.newline.co/fullstack-react
Release: r40 (January 2020)

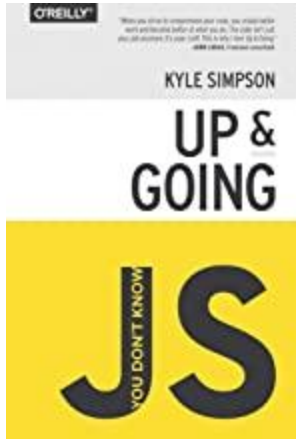


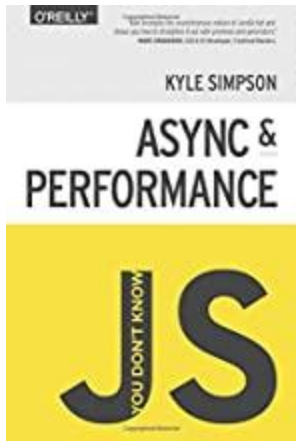
… and many others

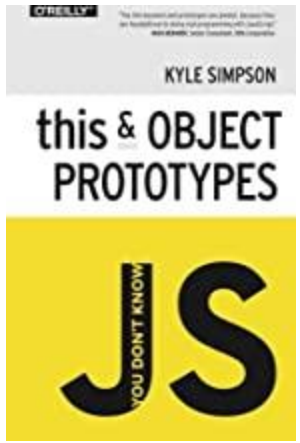
Resources (on-line books)

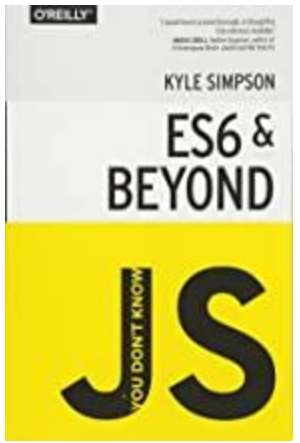




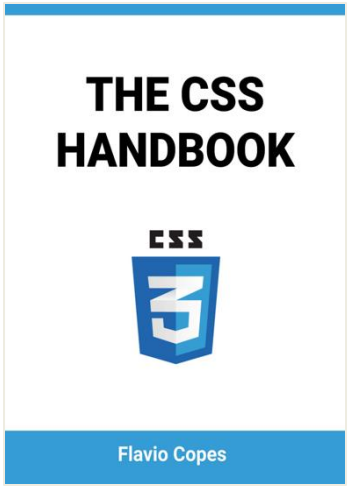


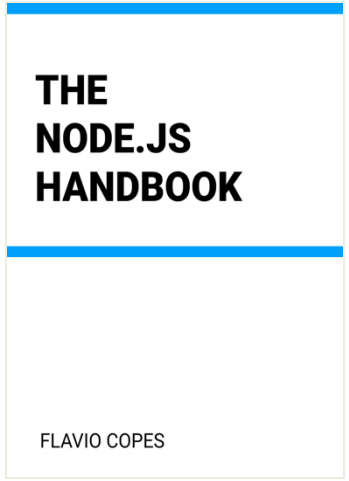






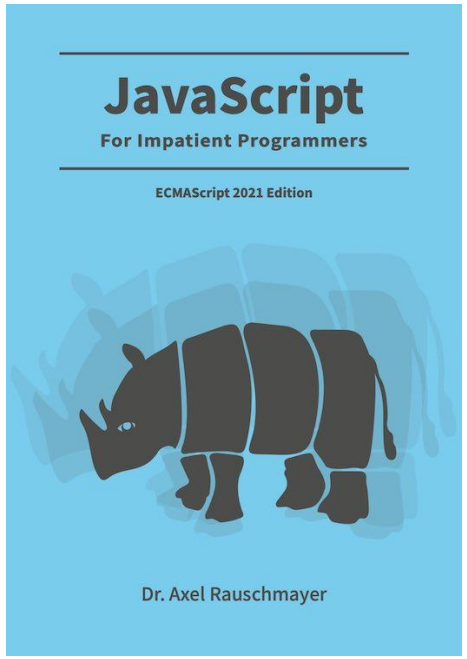
You Don't Know JS Yet (book series) - 2nd Edition
By Kyle Simpson (@getify)
https://github.com/getify/You-Dont-Know-JS





Flavio Copes Handbooks
https://flaviocopes.com/

Resources (on-line books)



https://exploringjs.com/impatient-js/index.html

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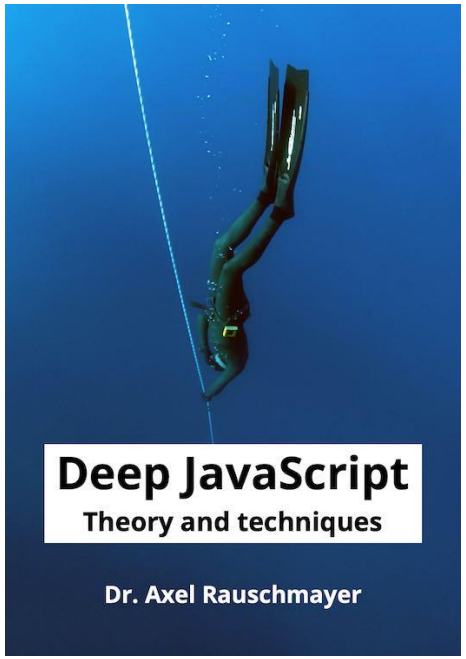
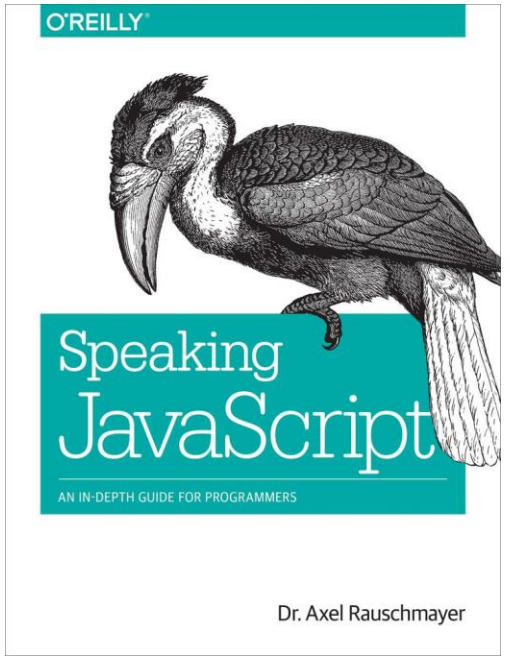
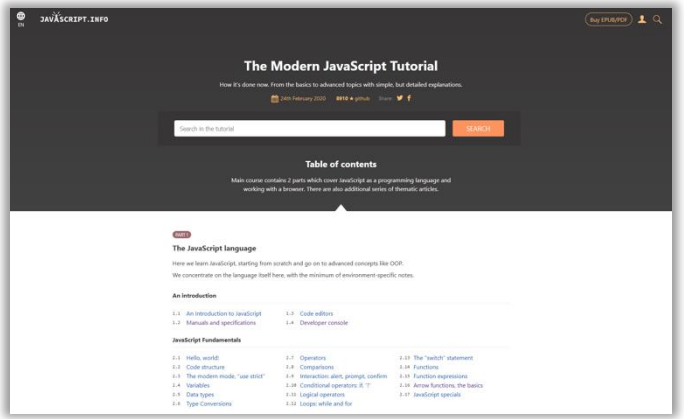


https://exploringjs.com/deep-js/index.html

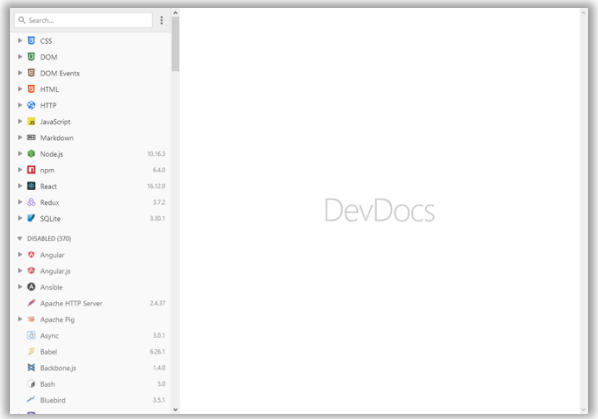


http://speakingjs.com/

More Resources…



The Modern JavaScript Tutorial
https://javascript.info/



DevDocs: API Documentation Browser
https://devdocs.io/

… and many others

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