FOUNDATIONS AND BEYOND

A WORKSHOP ON COMPUTER SCIENCE ESSENTIALS

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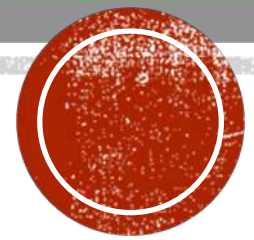
INTRODUCTION TO COMPUTER SCIENCE



UNDERSTANDING COMPUTATION

Curricular

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Co-Curricular

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PROGRAMMING CONCEPTS

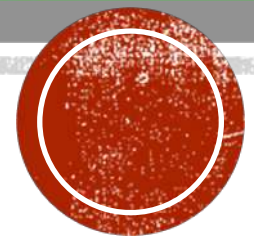
Curricular

- Theory, Syntax, Structure, Variables, Data Types
- Control Structures (Conditional and Loops)
- Arrays (1D and 2D) and String Manipulation
- Functions – Define, Parameters, Scope
- Object Oriented Programming
- Data Structures and Algorithms

Co-Curricular

- Error Handling and Debugging
- Version Control
- Coding Standards and Practices
- Advanced DSA
- Advanced Algorithms
- Competitive Programming

APPLICATION COMPUTER SCIENCE



SOFTWARE DEVELOPMENT

Frontend Development

- HTML, CSS, JavaScript
- Bootstrap, Tailwind CSS
- React/Vue/Angular
- TypeScript
- Java/Kotlin/Flutter/Swift/ReactNative
- Unity/UnrealEngine
- State Management

Backend Development

- Laravel (PHP)
- Flask/Django (Python)
- Spring (Java)
- MySQL, PostgreSQL (SQL Database)
- MongoDB (NoSQL Database)
- RESTful APIs
- Server Deployment (AWS, GCP, etc.)

WEB DEVELOPMENT

Curricular

- HTML, CSS, JavaScript
- Bootstrap
- Laravel (PHP)
- Django (Python)
- MySQL (SQL Database)

Co-Curricular

- Tailwind CSS
- MERN Stack – MongoDB, Express, React, Node
- Django
- RESTful APIs
- Deployment

APP DEVELOPMENT

Curricular

- Java
- Object Oriented Programming

Co-Curricular

- Android (Java or Kotlin)
- iOS (XCode Swift)
- Flutter (Cross-platform)
- React Native (Cross-platform)
- State Management (BLoC/Riverpod)

GAME DEVELOPMENT

Curricular

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Co-Curricular

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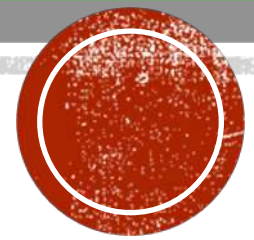
CORE COMPUTER SCIENCE



DATA SCIENCE

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CLOUD COMPUTING

- DevOps
- Cloud Providers:
  - Amazon Web Service (AWS)
  - Google Cloud Platform (GCP)
  - Microsoft Azure
- Deploying and Managing a Cloud Server
- Dockers ad Containerization
- Microservices

COMPETITIVE PROGRAMMING

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INTERNET OF THINGS

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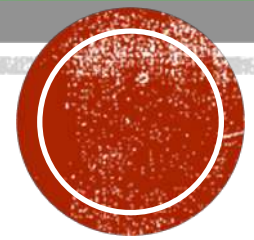
SPECIALIZATION IN COMPUTER SCIENCE



SPECIALIZATION IN COMPUTER SCIENCE

Cyber Security

- IP Addresses, TCP/IP Protocols
- Subnet Mask
- Knowledge about various Ports

- TryHackMe
- HackTheBox Academy
- Cybrary
- EC Council

Blockchain and AR/VR

- Decentralization
- Web 3.0
- Crypto Currency

- 3D Development
- Unity
- OpenXR SDK

COMPUTER SCIENCE ROADMAPS

- Detailed Roadmap for Various Domains: https://roadmap.sh
- Harvard Free Courses: https://www.edx.org/school/harvardx
- MIT Open Course Ware: https://ocw.mit.edu/
- Open Source Society University: https://github.com/ossu/computer-science
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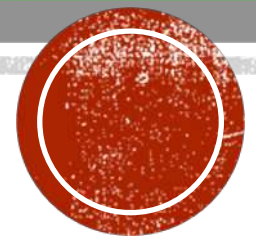
PROFILE DEVELOPMENT



TOPICS TO COVER

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