Graduate Certification Programme in Web Technologies

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2023

Table of Contents

Program highlights

Welcome to the Network Model Training Internship! Our program offers students an enriching and comprehensive experience in the realm of network technologies. Here are the program highlights that students can look forward to:

1. **Hands-on Experience:** Students will have the opportunity to work on real-world projects, simulations, and networking labs. This hands-on experience will enable them to gain practical skills that are crucial in the field of engineering.
2. **Industry-Relevant Curriculum:** Our curriculum is designed in collaboration with industry experts, ensuring that students learn the latest and most relevant concepts in network modelling and design.
3. **Industry Exposure:** We plan to organise guest lectures and workshops by industry professionals, providing students with insights into the current trends and demands in the networking domain.
4. **Certification Preparation:** For those interested, we will assist students in preparing for relevant industry certifications.
5. **Collaborative Learning Environment:** Our internship fosters a collaborative and supportive learning environment, encouraging students to work together, exchange ideas, and grow as a team.
6. **Mentorship and Guidance:** Each student will be assigned a mentor who will provide personalised guidance and support throughout the internship.
7. **Career Development:** We offer sessions on resume building, interview preparation, and networking opportunities to help students kickstart their careers in the field of networking.
8. **Project Showcase and Evaluation:** At the end of the internship, students will have the chance to showcase their projects to peers, mentors, and potential employers, receiving valuable feedback

Mentors and Expert

- **Nalinikanth M**
  - Lead Consultant, with overall 11+ years in IT industry and currently working as Security Specialist at ThoughtWorks
- **Sudhamsh K**
  - Lead Consultant, with overall 9+ years in IT industry and currently working as Infrastructure Consultant at ThoughtWorks
- **Anjani Kumar M**
  - Data Analyst III, with overall 9+ years in IT industry and currently working as Data Analyst at Walmart Global Tech
- **Rajesh Sheela**
  - Software Engineer III, with overall 7+ years in IT industry and currently working as Full Stack Engineer at Fanatics, Inc
- **Syed Sheeban Sadiq**
  - Senior System Engineer, with overall 7+ years in IT industry and currently working as System Engineer at Oracle
- **Raju S**
  - Implementation Coordinator, with overall 7+ years in IT industry and currently working as Implementation Coordinator at TISS
- **Anirudh K**
  - Senior Consultant, with overall 7+ years in IT industry and currently working as Quality Analyst at ThoughtWorks
- **Nitin I**
  - L2 Engineer, with overall 7+ years in IT industry and currently working as DevOps Engineer at Trianz
- **Sravan Kumar J**
  - Lead QA, with overall 7+ years in IT industry and currently working as Quality Analyst at Desynova
- **Nikhil S**
  - Senior Application Developer, with overall 7+ years in IT industry and currently working as Application Developer at Oracle
- **Akhil A**
  - Consultant, with overall 6+ years in IT industry and currently working as Software Developer at Capgemini

- **Sai Krishna K**
  - System Engineer, with overall 6+ years in IT industry and currently working as System Engineer at Oracle
- **Umar Basha**
  - Developer III, with overall 6+ years in IT industry and currently working as Full Stack Engineer at UST Global
- **Raghu Vamshi N**
  - System Engineer, with overall 4+ years in IT industry and currently working as System Engineer at Oracle
- **Sai Vineeth T**
  - DevOps Engineer, with overall 3+ years in IT industry and currently working as DevOps Engineer at Claranet
- **Amulya**
  - Analyst, with overall 3+ years in IT industry and currently working as Data Analyst at Deloitte
- **Pradeep C**
  - Developer, with overall 2+ years in IT industry and currently working as Software Engineer at Radius EduTech
- **Praneeth**
  - Software Engineer, with overall 2+ years in IT industry and currently working as Software Engineer at Covalense Global

Networked Model of Learning

A New Pedagogical Paradigm

The Networked Learning Model (NLM) is an innovative pedagogical strategy designed to harness the power of group learning, experiential learning, and mentorship. While its deployment necessitates higher initial effort compared to traditional classroom models, it offers significant improvements in learning outcomes. This paper discusses the central tenets of the Networked Learning Model, examining its components, structure, and pedagogical design, and highlights its potential applications across diverse fields from technology to philosophy.

1. Introduction

Education and learning processes have undergone substantial evolution due to technological advancements and an increased understanding of learner-centric methodologies. One such development is the Networked Learning Model (NLM), offering an enhanced, participative, and experiential learning approach. NLM breaks from traditional learning structures, replacing them with a group-based, mentor-guided learning system that promotes deep understanding and engagement.

2. Core Components of the Networked Learning Model

The Networked Learning Model (NLM) is founded on three interlocking components: Classroom Sessions, Peer-to-peer Project-Based Learning, and Mentoring. These components serve distinct yet interdependent functions, forming an integrative learning environment that stimulates critical thinking, encourages collaboration, and fosters mentor-guided learning.

2.1. Classroom Sessions

Classroom sessions, either physical or digital, form the starting point of the NLM structure. In these sessions, a Learning Leader (LL) plays a crucial role in introducing and discussing the subject matter. Unlike the traditional approach, where learners primarily play a passive role,the NLM promotes active learning. LLs invite participation from learners, thus converting the session into a dialogue instead of a monologue. The participatory nature of these sessions fosters critical thinking and engages learners more

intimately with the subject matter, thereby promoting better retention and comprehension.

The LL's role is to create an environment conducive to curiosity and exploration. They strategically break the subject matter into chapters and units, guiding learners through these components in a manner that encourages interaction and involvement

2.2. Peer-to-peer Project-Based Learning

Project-based learning, a key element in the NLM, is designed to reinforce the concepts introduced in classroom sessions. Learners are divided into small squads of approximately five members, although this can vary depending on the requirements of the project. These squads allow for intimate, effective collaboration, fostering a productive learning environment where ideas can be freely exchanged and perspectives broadened.

Each squad is tasked with a project that aligns with the subject matter taught in the corresponding classroom session. The goal of these projects is to apply theoretical concepts practically, thereby deepening understanding and knowledge. This strategy enhances learning by bridging the gap between theory and practice, facilitating a clearer grasp of real-world applications of academic concepts.

2.3. Mentoring

Mentoring is another essential component of the NLM, providing tailored guidance to each squad in their learning journey. The Squad Mentor (SM) serves as a facilitator, coach, and advisor, closely monitoring the squad's progress on their project work. They assist learners in identifying challenges, overcoming obstacles, and optimising the learning process.

The SM is also a vital link between the squad and the LL. They relay formative assessment feedback from the squad's project work to the LL. This feedback is invaluable for the LL to make necessary adjustments in teaching strategies, ensuring that the instruction remains effective and relevant. In this manner, the mentoring component not only supports learner progress but also contributes to the continuous improvement of the overall teaching approach in the NLM.

3. **Pedagogical Design**

The pedagogical design of the Networked Learning Model (NLM) is what truly sets it apart, fostering an environment that allows for active learning, collaboration, and continuous improvement. The design is divided into three main components: Structure, Implementation and Feedback Loop, and Connectivity Across Units.

3.1. Structure

The structure of NLM focuses on breaking the subject matter into manageable chunks. Each broad chapter is divided into smaller units, creating a systematic learning progression. This modular approach helps learners to digest and comprehend complex concepts more easily.

For each unit, a classroom delivery session is designed by the Learning Leader (LL). These sessions provide the foundational knowledge that the learners will later expand on during their project work. Corresponding to each classroom session, an activity or project is developed that ties directly to the unit's subject matter. These activities are designed to produce measurable learning outcomes, providing tangible evidence of a learner's understanding and progress.

3.2. Implementation and Feedback Loop

The Networked Learning Model operates on a cycle of teaching, learning, assessment, and feedback. The LL introduces and explains each unit in a participatory classroom session, where learners are encouraged to interact, ask questions, and discuss concepts. Following the classroom session, learners undertake project work in squads, applying the knowledge they've gained to a practical task.

The Squad Mentor (SM) plays a crucial role in this stage. They oversee the squads' progress, assess the learning outcomes of the project work, and provide valuable feedback to the learners. The SM also communicates these learning outcomes to the LL, creating a feedback loop that allows for continuous refinement of teaching strategies and adaptation to the learners' needs.

3.3. Connectivity Across Units

While each unit is designed to stand alone, they are also carefully designed to maintain a degree of interconnection. This connectivity ensures that learning is not compartmentalised, but instead builds upon previous knowledge, giving learners a holistic understanding of the subject

matter. The interconnection across units facilitates the integration of knowledge, encouraging learners to draw links between different concepts and to apply their knowledge in a broader context.

4. Assessment and Certification

Assessment is an integral part of the Networked Learning Model. It offers a concrete way to gauge learner understanding and track progress. Feedback from SMs and LLs, combined with objective results from assessments, provide a well-rounded picture of a learner's performance.

This performance information forms the basis of a holistic report card. Unlike traditional report cards that might focus solely on exam results, this holistic report card takes into account a range of factors. These can include participation in classroom sessions, contribution to squad project work, and the ability to apply knowledge practically.

Upon course completion, learners are awarded a certificate. This certificate not only serves as proof of completion but also as a testament to the learner's comprehensive understanding of the subject matter. It stands as evidence of their ability to participate actively in learning, collaborate effectively in a squad, and apply knowledge in a practical context, reflecting the core tenets of the Networked Learning Model.

Projects

In our Advanced Web Technologies module, we emphasise a project-based approach to enable students to apply their knowledge to real-world challenges. Through hands-on projects, students will explore cutting-edge web technologies and their potential to positively impact society.

1. **E-Learning Platform for Students:**

   Create an inclusive web platform that provides free access to quality educational resources, including interactive lessons, quizzes, and peer-to-peer learning forums. Optimise the platform for low-bandwidth connections and mobile devices to reach students in remote and economically disadvantaged regions.

2. **Community Sharing and Volunteering Network:**

   Design a web-based system that connects local communities, encouraging resource sharing and volunteer collaboration. Implement features like item lending, skill exchange, and event coordination to foster a sense of community and social responsibility.

3. **Web-Based Voting and Civic Engagement:**

   Design an accessible and secure web platform for conducting elections and public surveys. Implement features like voter authentication, and real-time result visualisation to enhance transparency and civic participation.

4. **Remote Healthcare Monitoring System:**

   Develop a web-based solution that allows healthcare professionals to remotely monitor patients' vital signs and health data. Integrate IoT devices to collect data in real-time, ensuring continuous care for patients with chronic conditions.

5. **Agricultural Knowledge Sharing Platform:**

   Create a web portal where experienced farmers can share their expertise and best practices with novice farmers in rural areas. Implement features like discussion forums, video tutorials, and interactive Q&A sessions to facilitate knowledge exchange.

6. **Crop Price Prediction System:**

   Build a web application that uses machine learning algorithms to predict crop prices based on historical data, weather conditions, and market trends. This platform will empower farmers to make informed decisions regarding crop choices and selling strategies.

7. **Farm-to-Table Supply Chain Tracking:**

   Build a web-based supply chain tracking system that allows consumers to trace the origin and journey of agricultural products they purchase. This promotes transparency and quality assurance, while also supporting local farmers and fostering consumer trust.

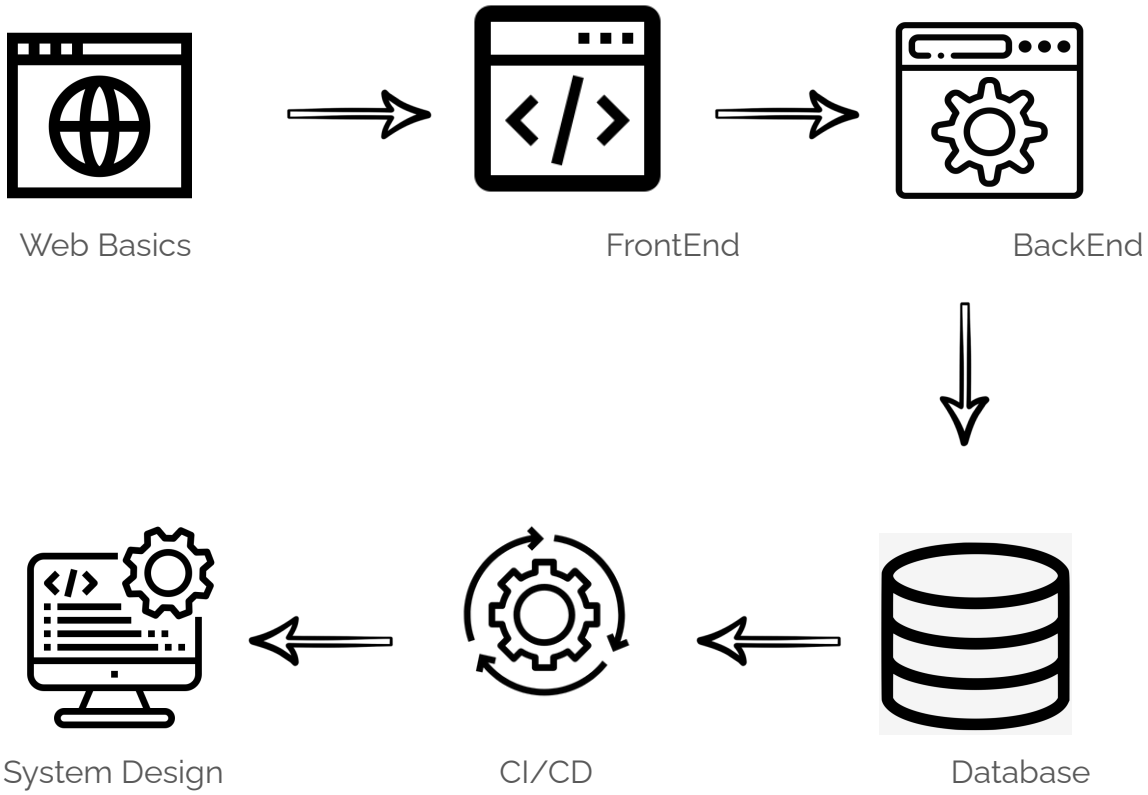
8. **Agricultural Education and Training:**

   Design an online learning platform that offers agricultural training and skill development courses for farmers in remote areas. The platform will include video lessons, interactive quizzes, and certification to enhance their farming practices.

9. **Farmers' Cooperative Management Portal:**

   Create a web-based cooperative management system that facilitates collaboration among farmers, enabling collective purchasing of resources, sharing of equipment, and marketing of produce for improved economies of scale.

Learning Path



Detailed Program Curriculum

Introduction to Version Control(GIT): Git is a vital tool for developers to manage code changes, collaborate effectively, and ensure project stability.

Module 1: Web and Basics

Basic HTML + CSS: Basic HTML + CSS focuses on the fundamentals of HTML and CSS coding. HTML is used to structure content on the web, while CSS is responsible for the visual presentation and layout of the HTML elements

Introduction to Web and HTML tags: The Introduction to Web and HTML tags covers the essential concepts of web development and the various HTML tags. HTML tags are used to define the structure and content of web pages, allowing developers to create headings, paragraphs, images, links, lists, and more.

Javascript: JavaScript is a powerful programming language used for web development to add interactivity and functionality to web pages. It enables developers to create dynamic and responsive web applications by manipulating the content and behavior of HTML elements.

HTML + CSS + Javascript (Custom Web Components): This combines all three core web technologies to create custom web components. These components are reusable, self-contained modules that encapsulate specific functionalities, enhancing code organisation and maintainability.

Module 2: FrondEnd

Introduction to Typescript: TypeScript is a superset of JavaScript that adds static typing to the language. It helps catch errors early in the development process, improves code quality, and enhances tooling support, making it a popular choice for large-scale front-end projects.

ReactJs: ReactJS is a JavaScript library for building user interfaces, particularly single-page applications. It allows developers to create reusable UI components and efficiently manage the application state, resulting in faster and more maintainable front-end development.

React Functional Hooks: React Functional Hooks are functions that provide additional functionality to functional components in React. They enable state management and allow developers to use lifecycle methods and other features previously limited to class components.

React state management: React state management refers to how data is handled and shared across components in a React application. Techniques like Redux and React built-in Context API are used to manage the state and ensure consistent data flow throughout the application.

React Component Library + Tailwind CSS: Integrating our project with custom open source UI libraries with tailwind css.

Module 3: Server-Side Development

NodeJs: Node.js is a server-side JavaScript runtime that allows developers to build scalable and fast network applications. It uses an event-driven, non-blocking I/O model, making it efficient for handling concurrent requests.

NodeJS + Express: Node.js combined with Express, a popular web application framework, simplifies server-side development. Express offers a range of features for building APIs and web applications with Node.js.

Module 4: Database

NoSQL DB: NoSQL databases are non-relational databases that provide flexibility and scalability. They are suitable for handling large volumes of unstructured or semi-structured data.

ORM: ORM is a technique that facilitates database interaction by allowing developers to work with database entities as if they were regular objects in their programming language. This abstraction simplifies data access and manipulation.

Module 5: CI/CD

Jenkins or Gitlab CI/CD: Jenkins and GitLab CI/CD are popular tools for implementing CI/CD pipelines. They automate the development workflow, allowing teams to integrate, test, and deploy code efficiently.

Deployment Process(Build-to-ship): The deployment process, known as "Build-to-ship," involves automating the steps from code compilation to production deployment. It streamlines software delivery and enables rapid, reliable shipping of new releases.

Module 6: System Design

Microservice Architecture: Microservice Architecture is a design approach where a complex application is broken down into smaller, loosely coupled services. Each service focuses on a specific function, allowing for easier development, scalability, and maintenance.

Programming tools, Languages & Libraries

1. **Web Development Frameworks:**

   Utilise popular web development frameworks like React to build dynamic and interactive user interfaces for the web-based applications.

2. **Server-Side Programming:**

   Implement server-side logic using backend languages such as Node.js or Java (Spring Boot) to handle data processing and business logic.

3. **Database Management:**

   Utilise relational databases like MySQL or PostgreSQL to store structured data, or consider NoSQL databases like MongoDB for flexibility and scalability.

4. **API Development:**

   Build robust APIs using tools like Express.js to enable seamless communication between the frontend and backend components.

5. **Version Control:**

   Employ version control systems like Git to manage and track changes in the codebase, facilitating collaboration among developers and ensuring code integrity.

6. **Authentication and Security:**

   Implement secure authentication mechanisms using tools like JSON Web Tokens (JWT) or OAuth 2.0 to safeguard user data and prevent unauthorised access.

7. **Web Accessibility:**

   Ensure web accessibility compliance using tools like aXe-core or pa11y to make the web applications inclusive and usable for people with disabilities.

Career Support

Welcome to our comprehensive Career Support program, designed to empower and equip you with the skills and resources needed to thrive in the professional world. Our aim is to provide holistic assistance throughout your career journey, from job search to excelling in your chosen field. Here's what you can expect from our Career Support program:

1. Job Opportunities: We understand that finding the right job can be challenging, so we offer personalised job assistance tailored to your career aspirations. Our dedicated team works closely with leading companies and industries to connect you with relevant job openings that match your skills and interests.

2. Interview Preparation: We believe that preparation is key to acing interviews. Our interview preparation sessions cover various aspects, including common interview questions, behavioural interviews, technical assessments, and how to showcase your strengths effectively. We'll equip you with the confidence and skills to excel in any interview situation.

3. Just in Time Interview (JIT): Sometimes, opportunities arise unexpectedly. With our Just in Time Interview sessions, you'll be ready to seize those moments with poise. Our experienced coaches will provide last-minute interview preparation and guidance, ensuring you can confidently tackle any interview at a moment's notice.

4. High Performance Coaching: We believe in your potential for greatness. Our High Performance Coaching sessions focus on unlocking your full potential, overcoming obstacles, and developing a growth mindset. Our coaches will guide you to excel in your career by enhancing productivity, time management, and resilience.

5. Career Mentorship Sessions: Building a successful career is a journey, and guidance from experienced mentors can make all the difference. Our mentorship sessions pair you with seasoned professionals who have excelled in your field of interest. They'll provide valuable insights, career advice, and help you navigate through challenges.

Why us?

- **Tailored Approach:** We recognize that each individual's career path is unique. Our support is personalised to meet your specific needs, helping you carve out a path that aligns with your goals.
- **Industry Connections:** We have strong connections with various industries, enabling us to offer you exclusive access to job opportunities and insights into market trends.
- **Holistic Development:** Our support goes beyond just finding a job. We focus on your long-term career growth and personal development, ensuring you are well-equipped to thrive in the professional world.
- **Lifetime Access:** Our Career Support doesn't end after you secure a job. As a part of our community, you'll have lifetime access to resources, workshops, and networking opportunities to help you progress in your career.

Masterclasses

Welcome to our exclusive Masterclasses, where we bring together top industry experts and influential guests to engage and inspire our students. Our Masterclasses are designed to provide a unique and enriching learning experience, offering invaluable insights from the very best in their respective fields. Here's what you can expect from our Masterclasses:

1. Expert Speakers: Our Masterclasses feature renowned experts, thought leaders, and industry pioneers who have achieved remarkable success in their careers. These speakers bring a wealth of knowledge and real-world experiences, sharing their journeys and valuable advice with our students.

2. Interactive Sessions: We believe in fostering meaningful interactions. During our Masterclasses, students have the opportunity to engage in Q&A sessions and discussions with the esteemed speakers. This allows for a dynamic exchange of ideas and insights, creating an immersive learning environment.