Chatbot Development Self-Learning Pathway: Node.js

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| **Introduction** | | This course is for anyone interested in developing chatbots using MS Bot Framework. This course helps in building a skill level which enables candidates to create a medium complexity chatbot prototype. | | | | | | | |
| **Target Audience** | | **Primary audience of this course are those who are interested in developing chatbots using MS Bot Framework** | | | | | | | |
| **Duration** | | **Full**  **10 Hours** | | **Partial**  **7 Hours** | | | | | |
| **Pre-requisite** | | **This course expects participants to have intermediate level** understanding of JavaScript and Node.js. User should have an active subscription of [Microsoft azure portal](https://portal.azure.com) ,list of other required software and material can be found [here](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-quickstart?view=azure-bot-service-3.0). User should also have [Bot emulator tool](https://docs.microsoft.com/en-us/azure/bot-service/bot-service-debug-emulator?view=azure-bot-service-3.0) to test bot locally. | | | | | | | |
| **Course Material** | | **Participants might find few overlapping areas between the reading material and online video tutorials, but it is by design and in principle they complete each other. It is expected that participants will make the best use of the entire study material provided. Specified material gives in depth information about the topics covered, however particular links with specified content will be provided against a topic in detailed manner in the Pathway section of this document.**   * **Documentation Links:** 1. [MS Bot Service](https://docs.microsoft.com/en-us/azure/bot-service/?view=azure-bot-service-3.0) : Documentation for MS Bot SDK and MS Bot Service  2. [LUIS](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/Home) : Documentation for LUIS service * **Video Courses:**   **1. Microsoft virtual academy:** [Creating Bots in the Microsoft Bot Framework Using Node.js](https://mva.microsoft.com/en-us/training-courses/creating-bots-in-the-microsoft-bot-framework-using-nodejs-16759) | | | | | | | |
| **Pathway** | |  | | | | | | | |
| **\*\* Mandatory**  **Topic** | | **Description** | | | **Hours/Mins** | | **Links** | | **Outcome** |
| 1. Getting started with bot framework**\*\*** | | Gives brief introduction of chatbot | | | **20 mins** | | Video : [Getting Started with the Bot Framework](https://mva.microsoft.com/en-US/training-courses/creating-bots-in-the-microsoft-bot-framework-using-c-17590?l=ALwJe9kqD_4000115881) | | Idea of what chatbot is. Why/Where it is useful to use one |
| 2. Overview of MS Bot SDK **\*\*** | | This topic describes key concepts and basics of MS Bot SDK | | | **15 mins** | | MS Documentation: [Overview](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-concepts?view=azure-bot-service-3.0) | | Introduction to terminologies, Idea of key concepts |
| 3. Building your first bot\*\* | | Gives a walk-through of building a bot using Bot application template and Bot Builder SDK and gives a brief introduction to bot testing using Bot Emulator | | | **20 mins** | | **MS Documentation:** [Create your first bot](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-quickstart?view=azure-bot-service-3.0) | | **A bot built using Bot template, Basic testing using Bot Emulator** |
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| 4. Dialogs **\*\*** | | Gives introduction to conversation dialogs, managing conversation of dialogs, its lifecycle and stack | | | **2 hours** | | **MS Documentation:** [Dialogs overview](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-dialog-overview?view=azure-bot-service-3.0),  [Define conversation steps](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-dialog-waterfall?view=azure-bot-service-3.0),  [Prompt for user input](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-dialog-prompt?view=azure-bot-service-3.0),  [Manage conversation flow](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-dialog-manage-conversation-flow?view=azure-bot-service-3.0),  [Replace dialogs](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-dialog-replace?view=azure-bot-service-3.0),  [Handle user actions](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-dialog-actions?view=azure-bot-service-3.0) **MVA Course video :** [Bot Workflow](https://mva.microsoft.com/en-us/training-courses/creating-bots-in-the-microsoft-bot-framework-using-nodejs-16759?l=U3F8OAIyC_2304668937) | | Model conversations and manage conversation flow using Dialogs. |
| 5. Communication via messages**\*\*** | | This section details out the communication mechanism between the bot and the user using messages. | | | **2 hours** | | **MS Documentation:**  [Create messages](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-message-create?view=azure-bot-service-3.0),  [Send and receive attachments](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-send-receive-attachments?view=azure-bot-service-3.0),  [Send proactive messages](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-proactive-messages?view=azure-bot-service-3.0), Add rich cards to messages,  [Add input hints to messages](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-send-input-hints?view=azure-bot-service-3.0),  [Send a typing indicator](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-send-typing-indicator?view=azure-bot-service-3.0),  [Intercept messages](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-intercept-messages?view=azure-bot-service-3.0)  **MVA Course video :** [Interacting with the User](https://mva.microsoft.com/en-us/training-courses/creating-bots-in-the-microsoft-bot-framework-using-nodejs-16759?l=5iA94BIyC_9804668937) | | Idea of how to use messages for communication between the bot and the user, Steps to create a message with rich media and send it between bot and user |
| 6. Azure Bot Service**\*\*** | | Gives Overview of Azure Bot Service and steps to create a bot using it (i.e. another way of creating bot) | | | **35 mins** | | **MS Documentation:** [Overview of Bot Service](https://docs.microsoft.com/en-us/azure/bot-service/bot-service-overview-introduction?view=azure-bot-service-3.0)**,** [Build a bot using Azure Bot Service](https://docs.microsoft.com/en-us/azure/bot-service/bot-service-quickstart?view=azure-bot-service-3.0) | | Insight of Azure Bot Service and another way of creating chatbot using it |
| 7. Overview of NLP and LUIS**\*\*** | | Introduction to LUIS and LUIS app | | | **10 mins** | | **MS Documentation:** [Overview of LUIS](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/Home) | | Can enable chatbot to understand user in natural language. |
| 7.1 Intents **\*\*** | | Details about LUIS intents | | | **20 mins** | | **MS Documentation:** [Intents Overview](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-intent) **,** [Adding Intents](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-how-to-add-intents) | | Handling LUIS intents and finding the intentions of user query for making bot intelligent |
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| 7.2 Entities **\*\*** | | Details about LUIS entities and roles | | | **30 mins** | | **MS Documentation:** [Entities Overview](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-entity-types) **,** [Roles Overview](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-roles)**,** [Adding Entities](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-how-to-add-entities) | | Handling LUIS entities and roles Finding the data inside user queries using entities |
| 7.3 Utterances **\*\*** | | Details about LUIS utterances and how to train a LUIS model | | | **18 mins** | | **MS Documentation:** [Utterances Overview](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-utterance) **,** [Adding Utterances](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-how-to-add-example-utterances)**,** [Training LUIS model](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-how-to-train) | | Ability to map utterance (Sentences) to intents and increase prediction score by doing so. Training of a LUIS model |
| 7.4 Testing **\*\*** | | Gives idea of testing the LUIS model created and testing options available. | | | **20 mins** | | **MS Documentation:** [Interactive Testing](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-interactive-test)**,** [Batch Testing](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-how-to-batch-test) | | Ability To test LUIS models through interactive testing or batch testing |
| 8. Using LUIS in Bot application **\*\*** | | Gives idea of integrating our Bot application with LUIS model built which gives intelligence to our bot | | | **25 mins** | | **MVA Course video :** [Natural Language Processing with LUIS](https://mva.microsoft.com/en-us/training-courses/creating-bots-in-the-microsoft-bot-framework-using-nodejs-16759?l=1Ee39CIyC_3704668937) | | Adding intelligence to our bot using LUIS service |
| 9. State management | | Gives idea about how to store and retrieve state data that is associated with a user, a conversation, or a specific user within the context of a specific conversation. | | | **25 mins** | | **MS Documentation:** [Overview State management](https://docs.microsoft.com/en-us/azure/bot-service/nodejs/bot-builder-nodejs-state?view=azure-bot-service-3.0) | | Ability to store contextual data that can be used in conversation flows, customizing experience etc. |
| 10. Optimizing NLP predictions | | Provides techniques using which we can increase prediction score of our LUIS model. It comprises of endpoint reviewing, phrase lists and patterns | | | **25 mins** | | **MS Documentation:** [Prediction score](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-prediction-score)**,** [Endpoint reviewing](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-review-endpoint-utterances)**,** [phrase lists](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-feature)**,** [patterns](https://docs.microsoft.com/en-us/azure/cognitive-services/LUIS/luis-concept-patterns) | | Developer will be able to optimize prediction score obtained from LUIS model. This helps in increasing efficiency and accuracy of our bot application |
| **Assignments** |  | |  | | |  | |  | | |
| **Exercise 1\*\* (6 hours)** | **Create an airline chatbot which should be able to**   1. **Search flights from origin to destination with other details a. Use LUIS to collect all user inputs, chatbot should not ask provided information again. b. Chatbot should ask required details to search the flight** 2. **Use adaptive card to show the flight details** 3. **Use dummy data for flight details** 4. **Show the flight status based on flight number** 5. **Create intents for small talk (greeting, how are you etc.) and handle them** | | | | | | | | | |