Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Hunarmand Pakistan Program

"Skills for All"



Course Contents / Lesson Plan Course Title: CIT (Web Development with Python)

Tags: Front End Technologies, Python, Django **Duration:** 6 Months

Revised Edition

Course Title	Web Development with Python
Objective of Course	The objective of the course is to train the person in such a way so that he/she may be able to learn and understand the advanced technologies and terminologies of python as well as develop tools/software in this domain.
Entry-level of trainees	Intermediate
Learning Outcomes of the course	 Master Python's object-oriented features such as state, class, objects and inheritance Process text using regular expressions Leverage OS services Implement GUI for your Python application Create modules to promote code-once-use-many-times practice Use Pylint to test and debug applications Deploy DB-API to Query databases Process CSV data through API Create complex platform-independent Python applications
Course Execution Plan	The total duration of the course: 6 months (26 Weeks) Class hours: 4 hours per day Theory: 20% Practical: 80% Weekly hours: 20 hours per week (5 days a week) Total contact hours: 520hours
Companies offering jobs in the respective trade	 Software Houses Government Institutes Upwork Freelancing Fiverr Crossover All Private Institutes who are managing software
Job Opportunities	Advance Python Applications & Programming for modern Knowledge-based Economies is the main key. It encourages youth to take up research and education in relevant fields of computer science, this course also helps students to design deep leaning models. and also help out the youth how to change the knowledge landscape in Pakistan and brought Pakistan to one of the leading countries in terms of research and software production. The central aim to facilitate students to work from home as freelancer, on a freelancer most of the employer post jobs relevant to our course (Python, Django) and it will great favor to girls who have no permission from their parents to work in industries, further aim is to improve our IT industry. As recently we have faced a pandemic situation and most of the employee lost their jobs, the one thing that work in such situation is IT and software companies. • https://www.fiverr.com/gigs/django • https://www.upwork.com/freelance-jobs/python/

- https://itempire.net/top-10-software-houses-in-pakistan.ite
- https://www.glassdoor.com/Job/python-jobs-SRCH_KO0,6.htm

The current rate of progress in software companies in Pakistan is not sufficient to meet the demands of the web applications in the years to come. In order to meet the challenges of the Software/IT companies in every fields of life in Pakistan the current progress rate must be tripled at least. All the companies Whether it is Google or Microsoft, all the giant companies are contributing their share in the software development, even if we start our business, we must need to get some websites for customer attraction and stock managements. The developed countries are now moving to online even in shopping, learning, business and Appointments and say thanks to developer who safe their times and provide such useful thing. Given the lack of opportunities in the country, we need to strive from now to bring a revolutionary and speedy change in the curricula so that a force of students be created in next 3 – 4 years who are trained in the areas of innovative latest programming languages and framework. Pakistan has tremendous talent of people between the age of 18 to 30 years who can be engaged in such creative learning opportunity and design and develop innovative software's and websites.

No of Students

25

Learning Place

Classroom / Lab

Instructional Resources

Development Platform:

- https://github.com/
- https://www.anaconda.com/distribution/
- https://www.jetbrains.com/pycharm/
- https://jupyter.org/

Learning Material:

- https://www.udemy.com/topic/data-science
- https://www.datacamp.com/
- https://www.coursera.org/browse/data-science
- https://www.edx.org/course/subject/data-science

https://online-learning.harvard.edu/subject/data-science

MODULES

Scheduled Week	Module Title	Learning Units	Remarks
Week 1	Introduction	 Motivational Lecture (For further detail please see Annexure: II) Introduction to data science Course applications and use cases Motivational lecture 	TASK1 Details may be seen at Annexure-I
Week2	Business intelligence	 Success stories (For further detail please see Annexure: III) Intro to Business intelligence Business reporting Using BIRT for BI PIVOT Tables and charts Data Visualization Histograms Bar charts Pie charts Box plots Density plots etc. 	TASK2 Details may be seen at Annexure-I
Week3	Interaction to debugging & User Interaction & Strings	 Motivational Lecture (For further detail please see Annexure: II) Basic Syntax (No Semicolon, indentation, no variables type declaration) Debugging Syntax Error Runtime Error Semantic Error Locate and resolve errors 	TASK3 Details may be seen at Annexure-I

		 Interactions Print Input Introducing to Strings Input Output Concatenations 	
Week4	Advance Strings	 Success stories (For further detail please see Annexure: III) Programming introduction Jupyter notebook Virtual Environments setup (Anaconda) Pycharm installation and tutorial (IDE) Learn to install packages and libraries Syntax Calling Arguments Return statement Working of modules Built in Functions 	TASK4 Details may be seen at Annexure-I 1st Monthly Test at end of month (Week-4)
Week 5	List data Type & Methods	 Motivational Lecture (For further detail please see Annexure: II) Syntax and semantics Append Pop Prepend Sort Count Index Insert Remove 	TASK 5A TASK 5A Details may be seen at Annexure-I

Week6	Dictionary Data Type	Success stories	TASK 6
	& Methods	• (For further detail please see Annexure: III)	TASK 6A
		• Keys	TASK UA
		• Values	<u>Details</u>
		• Items	<u>may be</u> seen at
		• Get	<u>Annexure-I</u>
		 Merging 	
		 Pop 	
		• Clear	
		 Copy 	
Week7	Intermediate level	Motivational Lecture	Task7
Week/	Programming in	(For further detail please see Annexure: II)	Task/
	python	• Tuple	Task 7A
		• Set	<u>Details</u>
		 Loops 	<u>may be</u> seen at
		Exception Handling	<u>Annexure-I</u>
Week 8	Functions	• Success stories (For further detail please see Annexure: III)	TASK8 Details
		• Define	may be
		Calling	<u>seen at</u> Annexure-I
		Default	
		Optional	
		 Pass by Value 	2 nd Monthly
		 Pass by Reference 	Test at end
		Recursive Function	of month (Week-8)
			(Week-b)
Week 9	Flow Control	 Motivational Lecture (For further detail please see Annexure: II) Loop Structure Conditional Operators Nesting Loops 	TASK9 Details may be seen at

		Exception Handling	Annexure-I
Week10	Packages & Object- Oriented Programming Advance OOP	 Success stories (For further detail please see Annexure: III) Packages Classes Objects Methods Accessors Motivational Lecture 	TASK10 Details may be seen at Annexure-I
TY COAL I	Tuvunee 001	 (For further detail please see Annexure: II) Inheritance Polymorphism Encapsulation Abstraction 	Details may be seen at Annexure-I
Week12	I/O operations	 Success stories (For further detail please see Annexure: III) File Handling File Types Nested Data Structures 	TASK12 Details may be seen at Annexure-I 3rd Monthly Test at end of month (Week-12)
Week12	Build your CV	Download professional CV template from any good site (https://www.coolfreecv.com or relevant) Add Personal Information Add Educational details Add Experience/Portfolio Add contact details/profile links 	

		•	
Week13	Projects	Motivational Lecture (For further detail please see Annexure: II)	TASK13 Details may be seen at Annexure-I
Week14	Python Application & Framework	 Success stories (For further detail please see Annexure: III) Desktop Applications Web Applications Machine Learning, AI, Data Science 	TASK14 Details may be seen at Annexure-I
Week15	Machine Learning Models	 Motivational Lecture (For further detail please see Annexure: II) Linear Regression Logistic Regression SVM KNN K-Mean Clustering ANN 	TASK15 Details may be seen at Annexure-I
Week15	Machine Learning Projects	Project Examples	

Week 16	Introduction to Deep	Success stories	TASK16
	Learning	 (For further detail please see Annexure: III) Sequential Network Conv1D Network Conv2D Network CNN 	Details may be seen at Annexure-I 4th Monthly Test at end of month (Week-16)
Week 17	Mini Project with Deep Learning	 Motivational Lecture (For further detail please see Annexure: II) Project Examples Handwritten Digit Recognizer Face Marching NLP Sentiment Analysis 	TASK17 Details may be seen at Annexure-I
Week18	Final Project	Success stories	TASK18
	Announcement	 (For further detail please see Annexure: III) Guideline to Trainees for FYP PROJECT Assignment Individual (According to Interest) Assign trending projects Guideline for freelancing Requirements Gathering Final Project Presentation 	Details may be seen at Annexure-I

Week 19 Week 20	Django Framework	 Motivational Lecture (For further detail please see Annexure: II) HTML CSS BOOTSTRAP JAVASCRIPT AJAX Success stories (For further detail please see Annexure: III) Project Creation in Django App Creation in Django URL Setting Views Defining Template Rendering 	TASK19 Details may be seen at Annexure-I TASK20 Details may be seen at Annexure-I 5th Monthly Test at end of month (Week-20)
Week 21	Advance Django 1	 Motivational Lecture (For further detail please see Annexure: II) Models with SQL database Creating Migrations Model Forms User Creation Form Authentication 	TASK21 Details may be seen at Annexure-I
Week22	Rest Framework	• Success stories (For further detail please see Annexure: III)	TASK22 Details may be

		Json Response	seen at
		• API	Annexure-I
		Serializers	
Week23	Advance Django 2		TASK22
		Email Configurations	<u>Details</u>
		Password Resetting	may be
		Social Account Connectivity	seen at
		Admin Privileges	Annexure-I
		 Decorators 	
		Deployment	
Week24	Django	Motivational Lecture	TASK23
W 66K24	Authentications	(For further detail please see Annexure: II)	IASK23
	Authentications	Password Reset	<u>Details</u>
		Account Activation with Email	<u>may be</u> <u>seen at</u>
		User Profile Management	Annexure-I
		• Osei Frome Management	
Week25	Python Libraries for	Success stories	TASK24
	Django	(For further detail please see Annexure: III)	<u>Details</u>
			Details
		WhatsApp Automation	may be
		WhatsApp AutomationSalary Alert Automation	may be seen at
			may be
		Salary Alert Automation	may be seen at
		Salary Alert AutomationLogin with Social Account	may be seen at
Wool-25	Flools	 Salary Alert Automation Login with Social Account Admin Panel Management 	may be seen at Annexure-I
Week25	Flask	Salary Alert AutomationLogin with Social Account	may be seen at
Week25	Flask	 Salary Alert Automation Login with Social Account Admin Panel Management Motivational Lecture 	may be seen at Annexure-I TASK25 Details
Week25	Flask	 Salary Alert Automation Login with Social Account Admin Panel Management Motivational Lecture (For further detail please see Annexure: II) Website using Flask 	may be seen at Annexure-I TASK25 Details may be
Week25	Flask	 Salary Alert Automation Login with Social Account Admin Panel Management Motivational Lecture (For further detail please see Annexure: II) Website using Flask Rest API with Flask 	may be seen at Annexure-I TASK25 Details
Week25	Flask	 Salary Alert Automation Login with Social Account Admin Panel Management Motivational Lecture (For further detail please see Annexure: II) Website using Flask 	may be seen at Annexure-I TASK25 Details may be seen at

Week 26	Entrepreneurship and	• Success stories	TASK26
	Final Assessment in	(For further detail please see Annexure: III)	Details
	project	 Job Market Searching 	<u>may be</u>
		• Self-employment	<u>seen at</u> Annexure-I
		• Freelancing sites	Final
		• Final Assessment	Exams

Tasks For Certificate in Web Development with Python

Task No.	Task	Description	Week
	Web Development Techniques		
1	Explore Importance of the Course	Make presentation on applications of Django in different fields.	1
2	Data exploration	Apply data visualization. • Histogram • Bar charts • Pie charts • Box plot	2
3	Test Code	Prepare presentation on types of errors and write unit test code for your program.	3
4	Loop	Evaluate that how much static memory is being consumed foe nested loop of your program.	4
5	Basic Python Program for String	Write a Python program to calculate working hours as 16 hours and 10 mint 16:05 and then split it with string method and convert it to minutes.	5
5A	Palindrome	Check that your name is palindrome or not?	
6	Encoding	Convert your string in some encoded format as "asad" will convert as "%\$%*".	6
6A	Dict Sum	Write a Python function to sum all the values in dictionary also control the exception for your program as for string value.	
7	Scrap and Exception	Write a Python program for scrapping any data and control the exception with exception handling methods of the python.	7
8	Functions	Write a program to pass an image to function and function convert the shape of image and return it to you.	8
9	Break and Continue	Explain the working of break and continue in loop and	9

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Task No.	Task	Description	Week
		conditional structure.	
10	Method Overriding	Write a program to explain the difference of Overriding and Overloading.	10
11	Public	 Explain the difference between public and default for encapsulation concept. 	11
12.	Encode and Decoded Data	Assume you have file and you don't want to show your data to hacker that what strategy you adopt to encode and decode your data.	12
13	Exercise and examples	 Search codes on GitHub and try to implement it Number plate Detection 	13
14	Exercise and examples	Make an application for weather temperature.	14
15	Exercise and examples	Perform Machine Learning Experiment on Provided data.	15
16	Presentation on ML	Make and deliver presentation about Deep Learning Paper.	16
17.	Face Recognition	For attendance system implement face recognition system.	17
18	Project Ideas	Present Project Ideas.	18
19	Portfolio	Design your portfolio.	19

Task No.	Task	Description	Week
20	Django Portfolio	Integrate your portfolio with Django Framework	20
21	Payroll	Develop an Website for Employee Payroll Management.	21
22	POSTMAN Develop an API and test it with postman.		
23	Heroku Deployment	Deploy your application on Heroku and present any good alternative.	23
24	Signals	Use Django signals and remove old profile picture when user update new one.	24
25	Exercise	Twilio API	25
26	Final project	Final project Assessment	26

What is freelancing and how you can make money online - BBCURDU

https://www.youtube.com/watch?v=9jCJN3Ff0kA

What Is the Role of Good Manners in the Workplace? By Qasim Ali Shah | In Urdu https://www.youtube.com/watch?v=Qi6Xn7yKIIQ

Hisham Sarwar Motivational Story | Pakistani Freelancer

https://www.youtube.com/watch?v=CHm BH7xAXk

21 Yr Old Pakistani Fiverr Millionaire | 25-35 Lakhs a Month Income | Interview https://www.youtube.com/watch?v=9WrmYYhr7S0

Success Story of a 23 Year - Old SEO Expert | How This Business Works | Urdu Hindi Punjabi https://www.youtube.com/watch?v=tIQ0CWgszI0

Failure to Millionaire - How to Make Money Online | Fiverr Superhero Aaliyaan Success Story https://www.voutube.com/watch?v=d1hocXWSpus

Annexure-II

SUGGESTIVE FORMAT AND SEQUENCE ORDER OF MOTIVATIONAL LECTURE.

Mentor

Mentors are provided an observation checklist form to evaluate and share their observational feedback on how students within each team engage and collaborate in a learning environment. The checklist is provided at two different points: Once towards the end of the course. The checklists are an opportunity for mentors to share their unique perspective on group dynamics based on various team activities, gameplay sessions, pitch preparation, and other sessions, giving insights on the nature of communication and teamwork taking place and how both learning outcomes and the student experience can be improved in the future.

Session-1 (Communication):

Please find below an overview of the activities taking place Session plan that will support your delivery and an overview of this session's activity.

Session- 1 OVERVIEW

Aims and Objectives:

- To introduce the communication skills and how it will work
- Get to know mentor and team build rapport and develop a strong sense of a team
- Provide an introduction to communication skills
- Team to collaborate on an activity sheet developing their communication, teamwork, and problemsolving
- Gain an understanding of participants' own communication skills rating at the start of the program

Activity:	Participant Time	Teacher Time	Mentor Time
Intro Attend and contribute to the scheduled.			
Understand good communication skills and how it works.			
Understand what good communication skills mean			
Understand what skills are important for good communication skills			
Key learning outcomes:	Resources:		Enterprise skills developed:
 Understand the communication skills and how it works. Understand what communication skills mean Understand what skills 	PodiumProjectorComputerFlip ChartMarker		CommunicationSelf ConfidenceTeamwork

are important for	
communication skills	

Schedule	Mentor Should do
Welcome: 5 min	Short welcome and ask the Mentor to introduce him/herself. Provide a brief welcome to the qualification for the class. Note for Instructor: Throughout this session, please monitor the session to ensure nothing inappropriate is being happened.
Icebreaker: 10 min	Start your session by delivering an icebreaker, this will enable you and your team to start to build rapport and create a team presentation for the tasks ahead. The icebreaker below should work well at introductions and encouraging communication, but feel free to use others if you think they are more appropriate. It is important to encourage young people to get to know each other and build strong team links during the first hour; this will help to increase their motivation and communication throughout the sessions.
Introduction & Onboarding: 20mins	Provide a brief introduction of the qualification to the class and play the "Onboarding Video or Presentation". In your introduction cover the following: 1. Explanation of the program and structure. (Kamyab jawan Program) 2. How you will use your communication skills in your professional life. 3. Key contacts and key information – e.g. role of teacher, mentor, and SEED. Policies and procedures (user agreements and "contact us" section). Everyone to go to the Group Rules tab at the top of their screen, read out the rules, and ask everyone to verbally agree. Ensure that the consequences are clear for using the platform outside of hours. (9am-8pm) 4. What is up next for the next 2 weeks ahead so young people know what to expect (see pages 5-7 for an overview of the challenge). Allow young people to ask any questions about the session topic.
Team Activity Planning: 30 minutes	MENTOR: Explain to the whole team that you will now be planning how to collaborate for the first and second collaborative Team Activities that will take place outside of the session. There will not be another session until the next session so this step is required because communicating and making decisions outside of a session requires a different strategy that must be agreed upon so that everyone knows what they are doing for this activity and how. • "IDENTIFY ENTREPRENEURS" TEAM ACTIVITY • "BRAINSTORMING SOCIAL PROBLEMS" TEAM ACTIVITY" As a team, collaborate on a creative brainstorm on social problems in your community. Vote on the areas you feel most passionate about as a team, then write down what change you would like to see happen. Make sure the teams have the opportunity to talk about how they want to work as a team through the activities e.g. when they want to complete the activities, how to communicate, the role of the project manager, etc. Make sure you allocate each young person a specific

	week that they are the project manager for the weekly activities and make a note of this. Type up notes for their strategy if this is helpful - it can be included underneath the Team Contract.		
Session Close: 5 minutes	MENTOR: Close the session with the opportunity for anyone to ask any remaining questions. Instructor: Facilitate the wrap-up of the session. A quick reminder of what is coming up next and when the next session will be.		

MOTIVATIONAL LECTURES LINKS.

TOPIC	<u>SPEAKER</u>	<u>LINK</u>
How to Face Problems In Life	Qasim Ali Shah	https://www.youtube.com/watch?v=OrQte08Ml90
Just Control Your Emotions	Qasim Ali Shah	https://www.youtube.com/watch?v=JzFsyJt-w_
How to Communicate Effectively	Qasim Ali Shah	https://www.youtube.com/watch?v=PhHAQEGehKc
Your ATTITUDE is Everything	Tony Robbins Les Brown David Goggins Jocko Willink Wayne Dyer Eckart Tolle	https://www.youtube.com/watch?v=5fS3rj6eIFg
Control Your EMOTIONS	Jim Rohn Les Brown TD Jakes Tony Robbins	https://www.youtube.com/watch?v=chn86sH0O5U
Defeat Fear, Build Confidence	Shaykh Atif Ahmed	https://www.youtube.com/watch?v=s10dzfbozd4
Wisdom of the Eagle	Learn Kurooji	https://www.youtube.com/watch?v=bEU7V5rJTtw
The Power of ATTITUDE	Titan Man	https://www.youtube.com/watch?v=r8LJ5X2ejqU
STOP WASTING TIME	Arnold Schwarzenegger	https://www.youtube.com/watch?v=kzSBrJmXqdg
Risk of Success	Denzel Washington	https://www.youtube.com/watch?v=tbnzAVRZ9Xc

SUCCESS STORY*

S. No	Key Information	Detail/Description
1.	Self & Family background	Mr Irfan is a computer Engineering graduate from VU Pakistan, He has completed the short course "Advanced Python Programming" from Kamyab Jawan Program. Now he is working as a web developer expert in Pakistan's pioneer IOT lab which is located in KICS UET Lahore, he is selected during his period of course
2.	How he came on board NAVTTC Training/ or got trained through any other source	Form KICS UET(NAVTTC partner institute)
3.	Post-training activities	Irfan area of expertise is in Python Programming . He was selected as a web developer expert in IoT lab during his course in Kamyab jawan Program, he is also doing freelancing and earning a handsome amount of money. "I needed to understand what worked, so I read blogs, participated in forums, and analyzed profiles of successful freelancers. It was an uphill struggle, but I didn't want to give up," he explains. Irfan says he understands why clients would be apprehensive giving projects to untested freelancers. They have hundreds of options to choose from, he explains, and to give a project to someone with no experience requires a strong leap of faith.
4.	Message to others (under training)	Take the training opportunity seriously Impose self-discipline and ensure regularity Make Hard work pays in the end so be always ready for the same.

^{*}Example pattern

 $\underline{\text{Note:}}$ Success story is a source of motivation for the trainees and can be presented in several ways/forms in a NAVTTC skill development course as under: -

- 1. To call a passed out successful trainee of the institute. He will narrate his success story to the trainees in his own words and meet trainees as well.
- **2.** To see and listen to a recorded video/clip (5 to 7 minutes) showing a successful trainee Audio-video recording that has to cover the above-mentioned points.*
- **3.** The teacher displays the picture of a successful trainee (name, trade, institute, organization, job, earning, etc) and narrates his/her story in the teacher's own motivational words.

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The online success stories of	f renowned professi	onal can also be o	btained from Ani	nex-II

Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

1. Attendance:

Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.

2. Character:

Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.

3. Team Work:

The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.

4. Appearance:

Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime

5. Attitude:

Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.

6. Productivity:

Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.

7. Organizational Skills:

Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

8. Communication:

Written communication, being able to correctly write reports and memos. Verbal communications, being able to communicate one on one or to a group.

9. Cooperation:

Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

10. Respect:

Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.