



*Ministry of cooperatives  
Labour and Social Welfare*



*Iran Technical and Vocational  
Training Organization*

Deputy of training  
Plan and curriculums office

# Competency Training standard

## Title

# Developing Activity-Based Intelligence (ABI) Applications

## Occupational group

Information Technology

**International code**

**2529-53-103-1**

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**Revision Process:**

- Scientific content
- According to market
- Equipment
- Tools

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## **Definitions:**

### **Job standard:**

The characteristics ' required competencies and abilities for Efficient Performance in work environment is called "the Job standard", and sometimes “The Occupational standard”

### **Training standard:**

The Training Map for achieving the Job’s subset Competencies.

### **Job title:**

Is a set of Tasks and Abilities which is expected from an employed person in the defined level

### **Job description:**

A statement covering the most important elements of a job, namely the position or title of the job, the duties, job’s relation with other jobs in a occupational field, the responsibilities, workplace conditions and required performance standards.

### **Course duration:**

The minimum of time which is required to achieve the training objects.

### **Admission requirements:**

The minimum of competencies and abilities which are obligatory for a potential admission.

### **Evaluation:**

The process of collecting evidence and judgment about whether a competency is achieved or not.

Include: written examination, practical examination

### **Required Qualifications for Trainers:**

The minimum of Trainer’s technical and vocational abilities which the trainer is required to have.

### **Competency:**

The ability of efficient performing a duty in a variety of workplaces conditions

Knowledge:

The minimum set of facts and mental capacities which is necessary for achieving a competency. This can include science, (Mathematics, physics, chemistry or biology), technology or technical.

### **Skill:**

The minimum coordination between mind and body for achieving an ability or competency. It normally applied to practical skills.

### **Attitude:**

A set of emotional behaviors required for achieving a competency and can have non-technical skills and occupational ethics.

### **Safety:**

The cases which doing or not doing something can cause harm or accident

### **Environmental Consideration:**

A set of consideration about the act which should be done to minimize the environmental damage or pollution.

<b>Competency Title:</b>
<b>Developing Activity-Based Intelligence (ABI) Applications</b>
<b>Competency Description:</b>
<p>ABI is a methodology for technology-enabled problem solving developed by the intelligence community to discover low-signature targets across Big Data. This is a highly technical programming course that provides the skills needed to become an ABI full-stack developer. This course teaches you how to quickly turn ABI analysts technical needs into mission-focused software applications.</p> <ul style="list-style-type: none"> <li>• Implement entity extraction techniques using Natural Language Processing</li> <li>• Standardize and automate the creation of geotemporal and relational metadata sets</li> <li>• Apply contemporary analysis techniques to Big Data</li> <li>• Implement performant spatiotemporal search strategies</li> </ul>
<b>Admission Requirements:</b>
<p>minimum degree of education: Computer or IT related Bachelor  minimum physical and mental ability:-  prerequisite skills:-</p>
<b>Course duration:</b>
<p><i>Course duration : 50 hours</i>  <i>-theoretical: 15 hours</i>  <i>-practical: 35 hours</i>  <i>-apprenticeship:... hours</i>  <i>-project:... hours</i></p>
<b>Course Evaluation :(%)</b>
<p><b>Written:25%</b>  <b>Practical:65%</b>  <b>Work ethics:10%</b></p>
<b>IRANTVTO Evaluation :(%)</b>
<p>Written Examination:25%  Practical Examination:65%  Ethics:10%</p>
Computer or IT related Bachelor with 2 years experience

## Competency training standard

### Tasks

	Title
1	<b>Introduction</b>
2	<b>Gathering and Acquiring Data File I/O</b>
3	<b>HTTP I/O</b>
4	<b>Stream I/O</b>
5	<b>Performing Extract, Transform and Load (ETL) Operations</b> <b>Geospatial Transformations</b>
6	<b>Textual Transformations</b>
7	<b>Imagery Transformations</b>
8	<b>Storing and Accessing Data Relational Storage Strategies</b>
9	<b>NoSQL storage strategies</b>
10	<b>Performing Common Analysis Methods</b> <b>Statistical analysis methods</b>
11	<b>Geospatial analysis methods</b>
12	<b>Human network analysis methods</b>
13	<b>Displaying and Visualizing Data GIS Visualization in QGIS and Google Earth</b>
14	<b>Tabular data</b>
15	<b>Deploying ABI Solutions Client-side deployment</b>
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Training standard

Contents analysis form

<b>Title:</b> Introduction	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>Principles of effective tactical data science</li> <li>Role of the data science with the intelligence production cycle</li> <li>Core fundamentals of Python</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Gathering and Acquiring Data File I/O	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Geospatial data in shapefile and KML file formats using pyshp and fastkml</li> <li>• Structured and unstructured text in Microsoft Office and CSV file formats using comtypes and PDFMine</li> </ul>	Determined by the instructor			According to the trainer
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				



<b>Title:</b> HTTP I/O	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>Finding and accessing RESTful web services</li> <li>Web-scraping and automated page interaction using selenium</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Stream I/O	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Creating, publishing and subscribing to message queues using ZeroMQ</li> <li>• Joining and posting to IRC channels using Willie</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Performing Extract, Transform and Load (ETL) Operations Geospatial Transformations	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>Coordinate format conversions between DD, DMS and MGRS using geotrans</li> <li>Geometry type conversions between point, line, and polygon using Shapely</li> </ul>	Determined by the instructor			According to the trainer
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

<b>Title:</b> Textual Transformations	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Spatial metadata extraction using OpenSextant</li> <li>• Text decomposition and named entity recognition (NER) using elasticsearch</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Imagery Transformations	time			Equipments ,tools, materials ,books
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				
<b>Knowledge and Skill:</b>			According to the trainer	
<ul style="list-style-type: none"> <li>• Mosaics and raster format conversion using GDAL</li> <li>• EXIF metadata extraction using exifread</li> </ul>	Determined by the instructor			
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

<b>Title:</b> Storing and Accessing Data Relational Storage Strategies	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• CRUD operations with SQLite</li> <li>• Applying full-text indexing using FTS3</li> <li>• Implementing geospatial indexing using R*Trees</li> </ul>	Determined by the instructor			According to the trainer
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

<b>Title:</b> NoSQL storage strategies	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• CRUD operations with MongoDB and Berkeley DB</li> <li>• Geospatial and text indexes in MongoDB</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Performing Common Analysis <b>Methods</b> Statistical analysis methods	time			
	theoretical	practical	total	
	Determined by the instructor			
<b>Knowledge ,skill ,attitude ,safety, Environmental Consideration</b>				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Linear regression techniques using NumPy</li> <li>• Time series analysis techniques using pandas</li> <li>• K-means clustering techniques using Scikit</li> </ul>	Determined by the instructor			According to the trainer
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				



<b>Title:</b> Geospatial analysis methods	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>Distance-based buffering and filtering using Shapely</li> <li>Kernel density estimation using Scikit</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Human network analysis methods	time			Equipments ,tools, materials ,books
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				
<b>Knowledge and Skill:</b>			According to the trainer	
<ul style="list-style-type: none"> <li>• Shortest and least-cost path analysis using NetworkX</li> <li>• Betweenness and closeness centrality using NetworkX</li> </ul>	Determined by the instructor			
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

<b>Title:</b> Displaying and Visualizing Data GIS Visualization in QGIS and Google Earth	time			
	theoretical	practical	total	
	Determined by the instructor			
<b>Knowledge ,skill ,attitude ,safety, Environmental Consideration</b>				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Display vector and raster representations using shapefiles and KMLs</li> </ul>	Determined by the instructor			According to the trainer
<b>Attitude:</b> Speed and accuracy in doing the right thing				
<b>Health &amp; Safety:</b> Compliance with safety protection in the workplace				
<b>Environmental Consideration:</b> Compliance with environmental protection				

<b>Title:</b> Tabular data	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Creating pivot tables using Microsoft Excel</li> <li>• Generating plots and charts using matplotlib</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Deploying ABI Solutions Client-side deployment	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Building a Windows stand-alone tool</li> <li>• Developing a Python plug-in for QGIS</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				

<b>Title:</b> Server-side deployment	time			
	theoretical	practical	total	
	Determined by the instructor			
Knowledge ,skill ,attitude ,safety, Environmental Consideration				Equipments ,tools, materials ,books
<b>Knowledge and Skill:</b> <ul style="list-style-type: none"> <li>• Creating a simple web interface using SimpleHTTPServer</li> <li>• Implementing a RESTful web service using bottlepy</li> </ul>	Determined by the instructor			According to the trainer
Attitude: Speed and accuracy in doing the right thing				
Health & Safety: Compliance with safety protection in the workplace				
Environmental Consideration: Compliance with environmental protection				