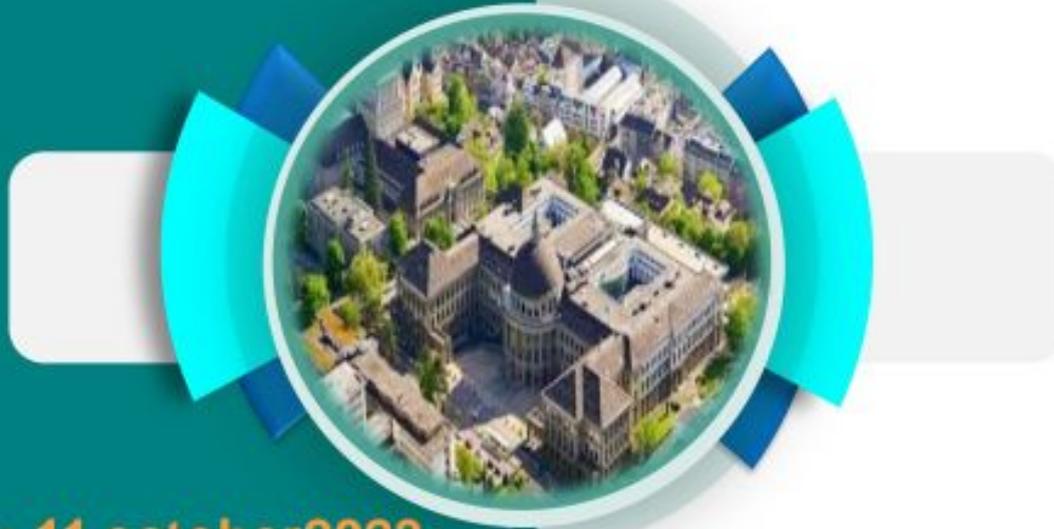


ALCOM

colloquium



Beginning: 11 october2023

University of Zurich

2023-2024

Time: 16:15-17:45

Presentation:16:15-17:00

Disscusion:17:00-17:45

**Training method : blended
learning(Hybrid)**



Origin University

Shahid Beheshti University

Host University

Zurich University, Switzerland

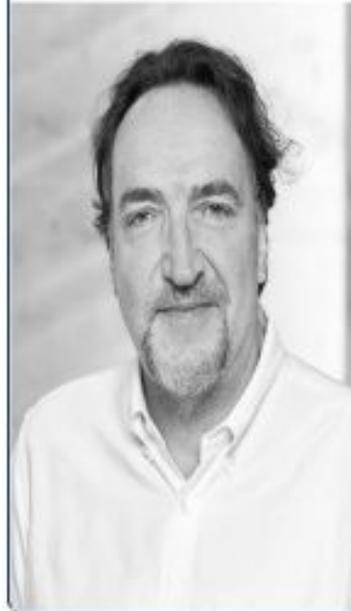
Institute of Education



Lead Professor

Roland Reichenbach, Prof. Dr.

Professor of General Education Studies



Roland Reichenbach has been a Professor of General Educational Studies at the University of Zurich, Switzerland, since 2013. His research focus and main interests are concerned with pedagogical ethics, the philosophy of education, political education as well as processes of negotiation and agreement.

Guest Visitor

Khorasani Abasalt.

Associate Professor of Higher Education
and Continuous Education

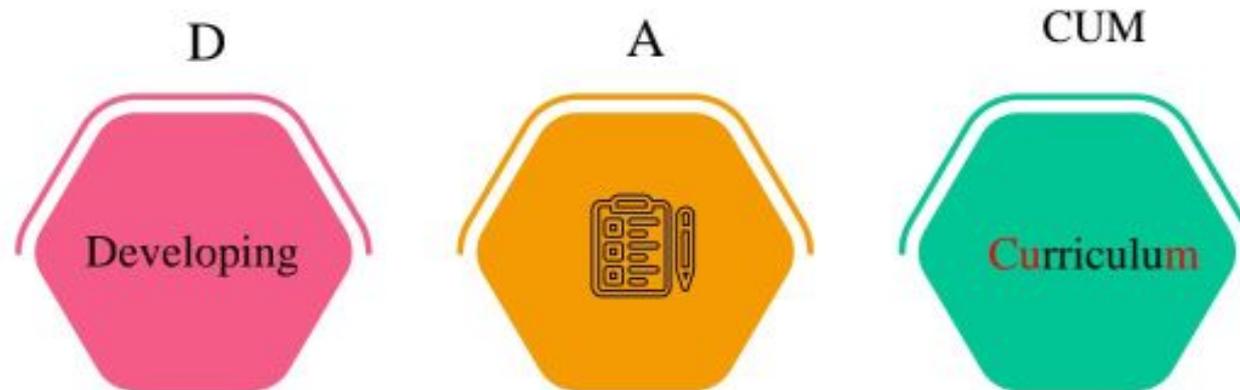


- ❑ Vice Chairman of UNESCO Chair in Management, Planning and Quality Assurance in Higher Education
- ❑ Director of Journal of Human Resource Training and Development
- ❑ Vice President of Higher Education Hub at Shahid Beheshti University
- ❑ Editorial Board Member of Iranian Higher Education Journal
- ❑ Board Trust Member and Founder of the Iranian Higher Education Association
- ❑ President of Iranian Society for Training and Development(NGO)

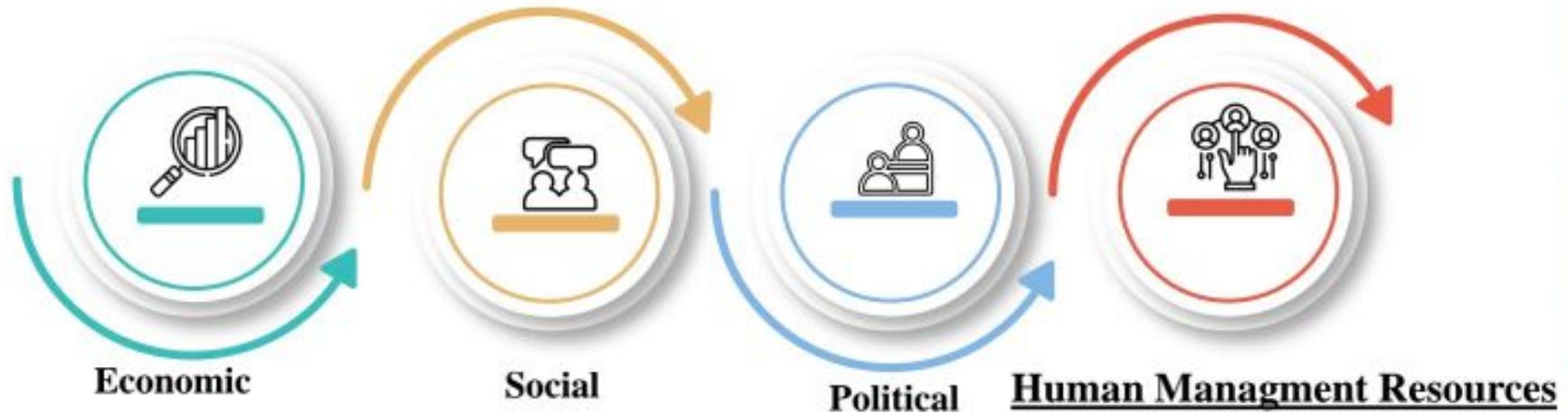


Application of the DACUM model for universities & higher education institutions

Case study “Lab expertise job”



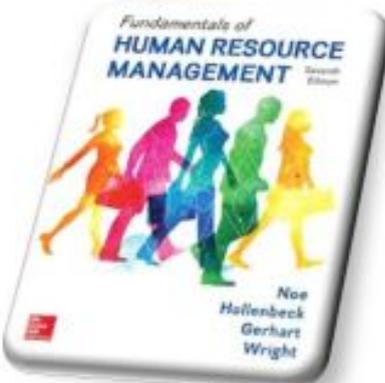
Iranian Higher Education Main Challenges



HR Challenges: Theoretical support

We have 19-22 process in HR based on Armstrong or Raymond Noe model in HR

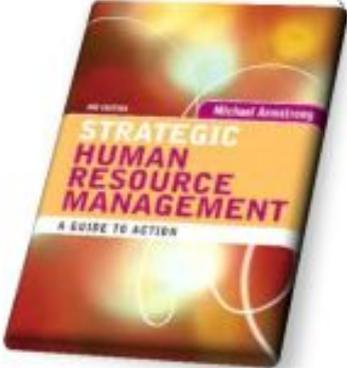
**THE GREATEST:
Organizational structure**



Raymond Noe



Michael Armstrong



Considerations of HR aspects in education

- ◇ Recruitment of teachers
- ◇ Cultural context
- ◇ Talent Manager/organizational designer
- ◇ Strategic approach
- ◇ Training and development standards
- ◇ Performance management



The Greatest HR Challenge

Organizational structure



Michael Armstrong



Main organizational structure challenges in Iranian educational systems



Holder exist without position



Position without holder



High (Overload) Quantity of human resources



Low Job fitness



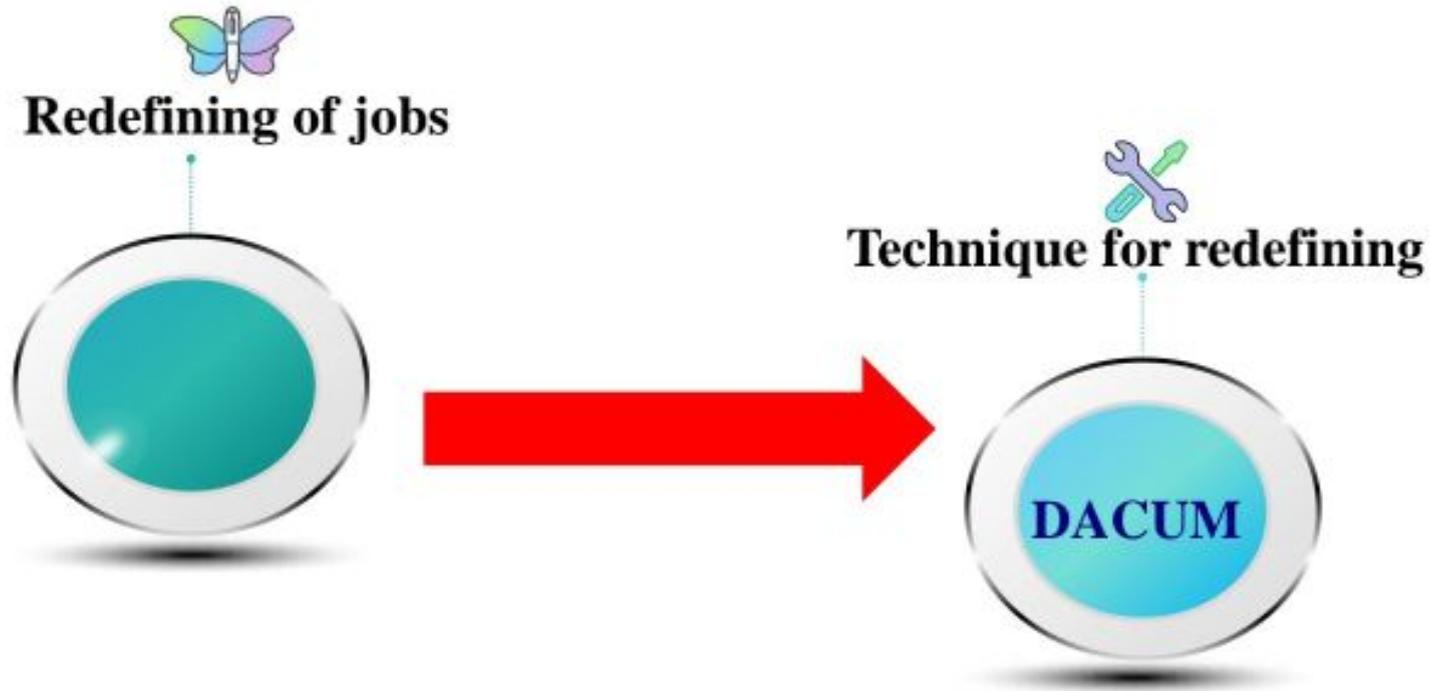
Low Quality of human resource



There is no Balance of human resource



Some solutions for eliminating of this challenges in organizational structure is



General Estimation

Based on research by IRP in 2022

There are between 900 to 1224 position in public universities.



- Dean
- Head of Department
- Named Professor
- Professor
- Reader
- Senior Lecturer
- Lecturer
- PostDoc Research Fellow
- Assistant Lecturer
- PhD Student



Based on research by IRP in 2022

Lab Technician



Is Key job is in universities





What was our technique?



Our technique was

DACUM



<https://files.eric.ed.gov/fulltext/ED401483.pdf>



Norton, Robert E.

THE OHIO STATE UNIVERSITY
CENTER ON EDUCATION AND
TRAINING FOR EMPLOYMENT

WHAT IS DACUM?

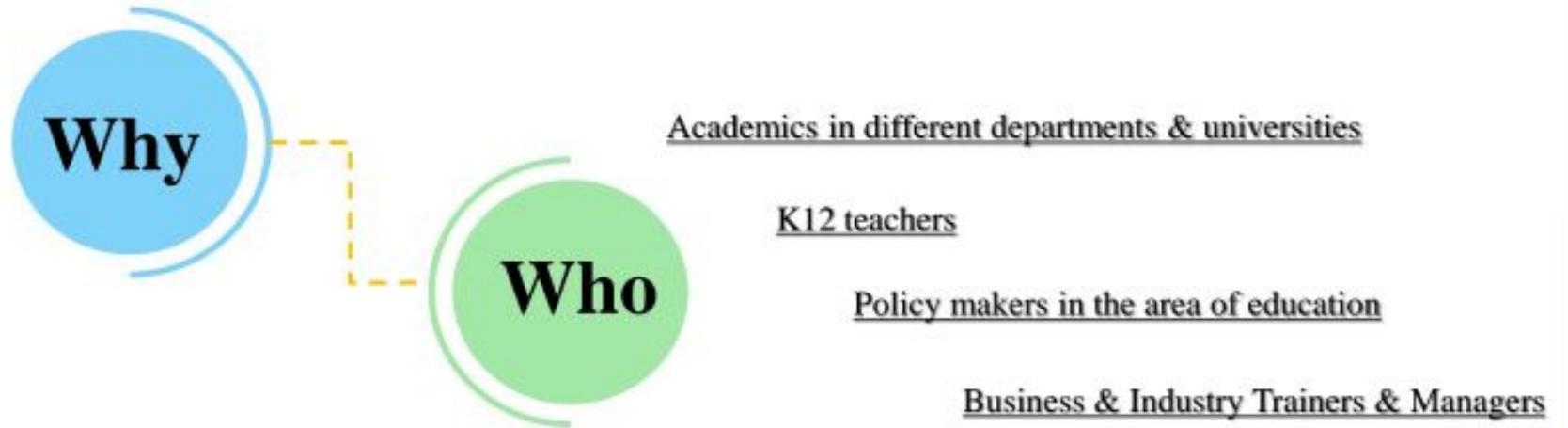
An acronym for Developing A Curriculum
A process for analysis of :

- ◆ a job
- ◆ an occupation
- ◆ a process
- ◆ a function



Who/Why Use DACUM?

- Effective
- Quick
- Low Cost



energy.

Who Uses DACUM?

DACUM is used by:

- **Educational agencies** such as state departments of education, community and technical colleges and institutes, proprietary schools/colleges, colleges of education and universities, and secondary schools.

Educational Agencies

A list of some of the educational agencies served by the Center on Education and Training for Employment, College of



13

21

AUTHOR	Norton, Robert E.
TITLE	DACUM Handbook. Second Edition. Leadership Training Series No. 67.
INSTITUTION	Ohio State Univ., Columbus. Center on Education and Training for Employment.

Education, The Ohio State University (hereinafter referred to as CETE) follows.



Philosophy

- **Expert workers can describe and define their job more accurately than anyone else.**
- **An effective way to define a job is to precisely identify the tasks that expert workers perform.**
- **In order to perform tasks, certain knowledge, skills, tools and worker behaviors are required.**

Key Terms





Duty

DUTY

Describes a large area of work in performance terms

Serves as a title for a cluster of related tasks

Is a general, not specific, statement of work that is performed

Is a meaningful, stand alone statement without reference to a job

Usually 6 to 12 duties per job





Task

Smallest unit of work with a useful outcome

Outcome is a product, service or decision

Is an assignable unit of work

Has a definite beginning and ending point

Can be observed and measured

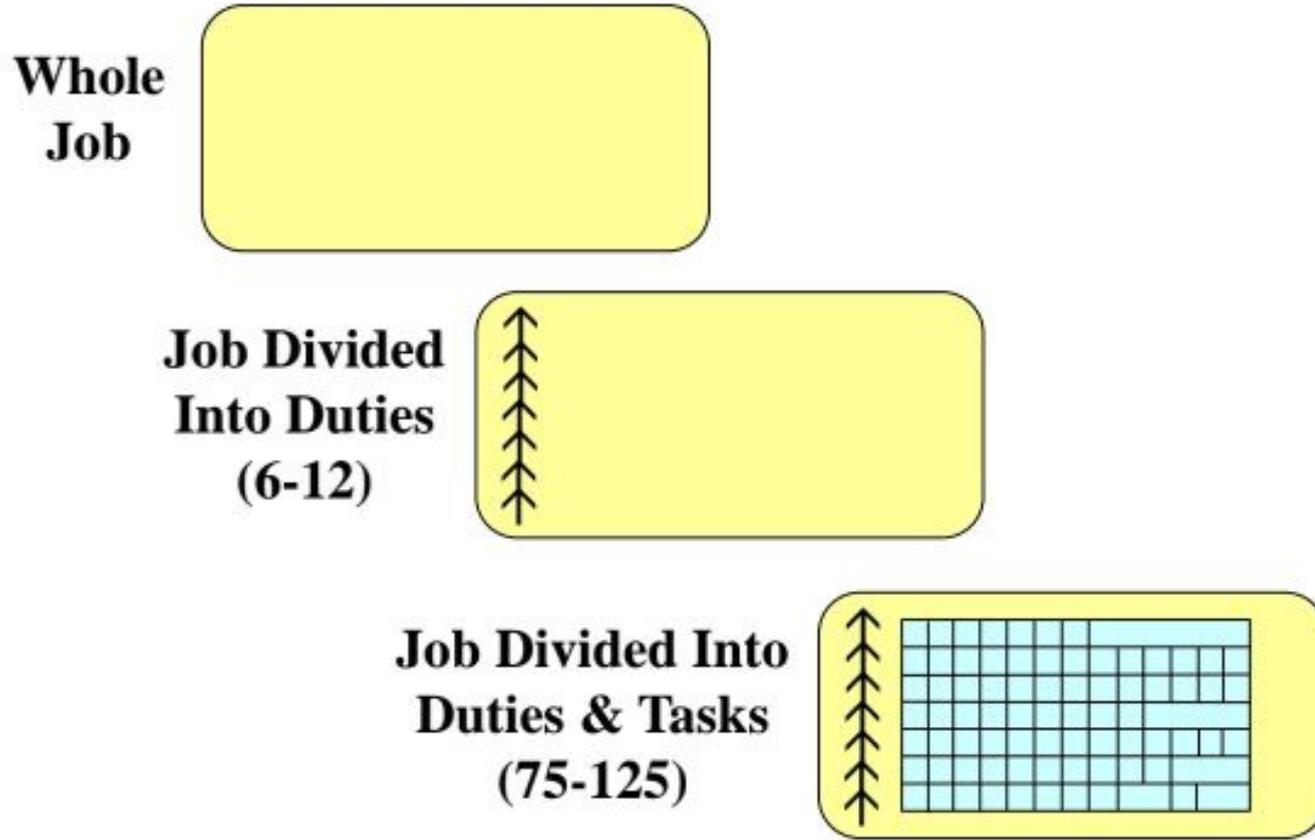
Can be performed independent of other task

Consists of two or more steps

Usually 6 to 20 tasks per duty



Duty & Task Relationships





Step

-  **Activities required to perform the task.**
-  **Is the detail of procedures.**
-  **Always two or more steps per task.**
-  **The DACUM panel does NOT identify steps.**
-  **Curriculum developers will develop the steps.**





Task Statement Criteria

Stated in performance, DOING, terms

Has a SINGLE action verb

Includes an OBJECT that receives the action

Contains one or more qualifiers

Is “Crystal” clear

Is a stand alone statement, not dependent on the duty or other tasks for meaning

Avoids references to tools, equipment and knowledge



Components of Task Statements

Qualifier

Words or phrases used to modify, describe, clarify the statement.

Verb

The verb is in the first person, singular, active voice.

The object is the thing acted upon by the worker.

Object

Example #1

Job Homeowner
Duty Maintain the yard
Task Mow the lawn
Step Start the mower



Example #2

Job Homemaker
Duty Prepare meals
Task Bake Cookies
Step Mix ingredients



Example #3

Job Academic Member
Duty Teaching
Task Developing of lesson plan
Step writing of behavioral objectives



Lesson Plan

Date	Grade level
Teacher	Subject
Objectives	
Materials	Assess
Procedure	
Extension	

BEHAVIORAL OBJECTIVES
A behavioral objective is a clear, specific, and measurable statement of what a learner is expected to achieve at the end of a unit of work.

PURPOSE

Behavioral objectives are important because they:

1. Provide a clear focus for instruction.
2. Help learners understand what is expected of them.
3. Create benchmarks to measure attainment.

HOW TO WRITE

- Use Bloom's Taxonomy Verbs: A taxonomy of cognitive skills, from low-level to high-level cognitive abilities. Use Bloom's verbs to formulate your objectives.
- Use SOLO Taxonomy Verbs: An alternative taxonomy describing observable behavior, scaling in complexity, rather than cognitive skills.

HELPINGPROFESSION.COM

<https://www.onetonline.org/link/details/25-1125.00><https://www.onetonline.org/link/details/25-1125.00>



- Trainer**
- Observer**
- Recorder**
- Expert workers**





DACUM Workshop Outcomes

- **Precisely stated job duties and task**
- **Lists of:**
 - General knowledge and skills**
 - Worker behaviors**
 - Tools, equipment, supplies and materials**
 - Future trends/concerns**
 - Acronyms (optional)**



DACUM Standards



All duty and task statements contain a single verb, an object and one or more qualifiers.

The same task appears only once.

Duties and tasks are logically sequenced.

There are 6 to 12 duties per job and 6 or more tasks in each duty.

Lists of knowledge, behaviors, tools and trends are developed.

A majority of the committee represents expert workers.

Workshop Ground Rules

- Offer constructive suggestions rather than criticism.
- Consider and reconsider all task and duty statements carefully.
- Don't use references.
- Observers cannot participate.
- **HAVE FUN!**





CASE STUDY:

A sample of designing an educational program based on job analysis using the DACUM method



job title:

Laboratory technician/senior technician



Duty:																											
MT	MST	Time					Frequency					Importance					Difficulty (level of learning)					SUB TASK (Activity)	TASK	ROW			
		5	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1						

DUETY#3: Quality Control According to the Instructions S = ./56

MT	MST	Time					Frequency					Importance					Difficulty (level of learning)					SUB TASK (Activity)	TASK	Row
		5	4	3	2	1	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1			
3.7	2.75				*					*					*					*		Checking the cleanliness of devices, containers and sampling tools	Process quality control	1
	3.75		*						*					*					*			Examining the obtained solutions		
	3.25			*						*				*					*			Examining the chemical mediators of the experiments		
	4.5		*							*				*				*				Examining the temperature and conditions required for experiments		
	4.75	*								*				*				*				Controlling the way experiments are conducted		

DUETY:

Categories of learning	Domains of learning			Traits & Attitudes	Competency & skill type			Skill & competency level			activities	TASK
	Psychomotor	Affective	Cognitive		Technical skills	Conceptual Skills	Human Skills	Skill	Ability	Knowing		

The title of the general task DUETY3: quality control according to the instructions

categories of learning	Domains of learning			Traits & Attitudes	Competency & skill type			Skill & competency level			activities	TASK
	Psychomotor	Affective	Cognitive		Technical skills	Conceptual Skills	Human Skills	Skill	Ability	Knowing		
Knowledge			*	Knowing the principles and standards of laboratory equipment	*			Getting to know the standards of sampling devices and tools			D3T1S1	T1
Knowledge/application			*	Identification of chemical solutions and their process	*			Ability to investigate chemical solutions			D3T1S2	
Knowledge/application			*	Identification of chemical mediators and their process	*			The ability to examine the chemical mediators of experiments			D3T1S3	
Practice and mastery	*			Identifying and applying the principles and guidelines of experiments	*			Skill in checking temperature and conditions required for experiments			D3T1S4	
Comprehension/evaluation			*	Identifying and controlling the correct process of experiments	*			Skill in controlling the way experiments are conducted			D3T1S5	

Learning classification	Domains of Learning			Traits & Attitudes	Competency & Skill type			Related Knowledge, ability & skills			SUBTASK	TASK
	Psychomotor	Emotional	Cognitive		Technical	Perceptive	Manual	Skill & Competency level				
								skills	ability	Knowledge		
Knowledge and Applications			I	Familiarity with equipment and its usage in experiments	I			Proficiency in preparing supplies and equipment			D1 T1 S1	T1
Practice and Mastery	I			Understanding the principles and techniques of solubilization	I			Proficiency in creating solutions to meet standard requirements			D1 T1 S2	
Practice and Mastery			I	Familiarity with methods of chemical addition	I			Familiarity with adding necessary chemicals			D1 T1 S3	
Practice and Mastery	I			Understanding the principles of device setup and reading the standard sample		1		Proficiency in setting up the device and reading the standard sample			D1 T1 S4	
Practice and Mastery	I			Understanding the method and executing calculations	I			Ability to perform accurate calculations			D1 T1 S5	
Practice and Mastery	I			Familiarity with the principles of preparing supplies and equipment	I			Proficiency in preparing supplies and equipment			D1 T1 S1	T2
Practice and Mastery	I			Identification and analysis of methods for standard solution preparation	I			Proficiency in creating solutions according to the standard			D1 T1 S2	
Knowledge and Applications			I	Understanding the principles and standard methods of device calibration and sample reading		1		Familiarity with setting up the device and reading the standard sample			D1 T1 S3	
Knowledge and Applications			I	Understanding how to perform calculations	I			Understanding how to perform calculations			D1 T1 S4	
Knowledge and Applications			I	Knowing how to prepare weights		1		Familiarity with preparing the necessary weights			D1 T1 S1	T3
Practice and Mastery	I			Analysis of principles and methods for standard calibration	I			Proficiency in calibrating devices following the provided instructions			D1 T1 S2	

Duty : Calibration and checking of devices and equipment

Tools & Equipment	Education Method				Education Necessity			Education Content	Traits & Attitudes	Code
	RT	OJT	JA	CT	SUP	IMP	CRI			
			ü	ü				Familiarity with laboratory tools and equipment	Knowing the equipment and use of equipment in the laboratory	D1 T1 S1
	ü	ü						Understanding the principles and methods of solubilization	Identifying the principles and methods of solubilization	D1 T1 S2
	ü	ü						Knowledge of calibration methods and chemical addition techniques	Knowing the methods of adding chemicals	D1 T1 S3
	ü			ü				Identifying the principles and standard methods for adjusting devices and reading samples	Identifying the principles and standard methods of device adjustment and sample reading	D1 T1 S4
				ü				Understanding the method and performing calculations	Identify the method and make the calculation	D1 T1 S5
		ü		ü				Familiarity with the principles and procedures for preparing supplies and equipment	Identifying the principles and preparing supplies and equipment	D1 T1 S1
		ü		ü				Identification and analysis of standard solution methods	Identification and analysis of standard solution methods	D1 T1 S2
	ü			ü				Understanding the principles and standard methods for adjusting devices and reading samples	Knowing the principles and standard methods of device adjustment and sample reading	D1 T1 S3
				ü				Ability to perform calculations	Knowing how to perform calculations	D1 T1 S4
		ü		ü				Knowledge of weight preparation techniques	Knowing how to prepare weights	D1 T1 S1
		ü		ü				Analysis of standard calibration methods	Analysis of standard calibration methods	D1 T1 S2

The design of Tools & Equipment has not been completed due to the absence of some participants in the VALIDATION meeting and differences in the tools,

The Title of the General Task of DUETY#3: quality control and compliance with standards

Tools & Equipment	Education method				Education Necessity			Education Content	Traits & Attitudes	Cod
	RT	OJT	JA	CT	SUP	IMP	CRI			
				*	*			Laboratory tools and equipment	Knowing the principles and standards of laboratory equipment	
		*		*		*		Solving principles and methods	Identification of chemical solutions and their process	
		*		*		*		Characteristics and application of chemical mediators	Identification of chemical mediators and their process	
	*			*		*		Optimal laboratory instructions	Identifying and applying the principles and guidelines of experiments	
44	*			*		*		Optimal laboratory principles and rules	Identifying and controlling the correct process of experiments	



The title of educational modules: quality control of processes

Behavioral goals:

-
-
-

Educational content:

- Laboratory tools and equipment
- Principles of solution methods
- Characteristics and Application of chemical mediators
- Test Instructions
- Optimal laboratory principles and rules

Course prerequisites:

Necessity of training: SUP IMP CRI

Educational technology



(Educational method) :RT OJT JA CT

Materials, Space and Educational Aids: Educational Booklet, MS PowerPoint, Laboratory Equipment

Course type: General Specialized Theory Practical

Participant conditions (Course Level): Manager Senior expert Expert Technician

Learning area: cognitive/psychomotor

Class: knowledge, application/understanding and evaluation/practice and mastery

Course instructor:

Time:

Effectiveness measurement method: survey pre-test/post-test effect on performance results

Reasons for developing web-based software and plugins

- **Quick tracking possibility**
- **Shorten the process time**
- **Reduction of verbal services**
- **Review instead of renewal**
- **Increasing work speed and reducing costs**

An example of the project process

The screenshot shows the Microsoft Access interface with a form titled "مشخصات کتب شغل" (Job Book Specifications). The form contains a table with the following data:

کد شغل	عنوان شغل	تکمیل کننده
2603017733037	نگارخانه ارتقاء حرفه	
بخش	نگهداری و تعمیرات واحد عملیاتی	
مدیریت	آموزش و مسابقات	
مدرک تحصیلی	فوق دیپلم فنی	

Below the table, there are several buttons for navigation and actions, including "بازگشت به آموزش شغل", "استاندارد مهارت", "وظایف شغل", "نمایش بازگشت آموزش شغل", "نمایش استاندارد مهارت", and "نمایش وظایف شغل".

A green callout bubble on the right side of the screen points to the magnifying glass icon in the form, with the text "The plugin of this project".



کد شغل 2603017733037

عنوان شغل تکمیل کننده برق

امتیاز	مدت زمان			سطح یادگیری			تکرار و فراوانی			ضرورت و اهمیت			Duty	code
	3	2	1	3	2	1	3	2	1	3	2	1		
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	1- تعمیر و نگهداری از کتبه اجهزات برق فشار قوی	6231
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	2- تعمیر و نگهداری از سیستم برق فشار متوسط	6232
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	3- تعمیر و نگهداری از سیستم برق فشار متوسط	6233
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	4- تعمیر و نگهداری از سیستم برق دستگاه	6234
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	5- تعمیر و نگهداری از سیستم برق ایستگاه فشار	6235
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	6- سفارشات خرید قطعات بدگی برق واحد و کدینگ آنها	6236
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	7- سفارشات ساخت قطعات	6237
1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	8- اجرای کتبه حکم کارهای برق روشنایی ، اضطراری ،	6238



Task

trainapp_Backup : Project - training (Access 2002 - 2003 file format) - Microsoft Access

Home Add-Ins

Paste Clipboard Font Rich Text Records Sort & Filter Window Find

وظایف شغل

وظایف شغل

خروج از فرم آخرین قبلی بعدی چاپ جستجو اصلاح انصراف حذف اضافه نمایش پرستاشی شغل سابقه

تکمیل ارشد برق 2603017733037 کد شغل

6231 عنوان وظیفه

1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق

Duty Task

1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	تعمیر و نگهداری از ترانس های پست ها
1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	تعمیر و نگهداری از دیزل ژنراتورهای پست ها
1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	تعمیر و نگهداری از ایرکاندیشن های پست ها
1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	تعمیر و نگهداری از سیستمهای برقی تاورها
1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	نگهداری از پست های برق و اتاق کنترل
1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	تعمیر و نگهداری از تجهیزات تابلوهای پست ها و اتاق کنترل
1- تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	تعمیر و نگهداری از کلیه کابینهای پست ها

Activity

Record: 1 of 7

Task

Record: 1 of 8

start Microsoft Access - tra... تکمیل ارشد برق

01:10

trainapp_Backup : Project - training (Access 2002 - 2003 file format) - Microsoft Access

Home Add-Ins

Clipboard Font Rich Text Records Sort & Filter Window Find

Activity

خروج از فرم آخرین قبلی بعدی چاپ جستجو اصلاح انصراف حذف اضافه نمایش پرسشهای شغل سابقه

تکسین ارشد برق	2603017733037	کد شغل
1-تعمیر و نگهداری از کلیه تجهیزات برق فشار قوی ، متوسط و ضعیف مسافر در ایستگاه برق	6231	عنوان وظیفه
تعمیر و نگهداری از ترانس های بست ها	8355	عنوان TASK

Task	Activity
تعمیر و نگهداری از ترانس های بست ها	- بازدید و چک کردن ترانس و اتاف ترانس از نظر تعمیر .
تعمیر و نگهداری از ترانس های بست ها	- بازدید از روغن ، سیمکاز ، بوتینگ ها و جعبه مقاومت NGR .
تعمیر و نگهداری از ترانس های بست ها	- تعمیر و تعویض قطعات ترانس ها و باتونهای آنها .

Record: 1 of 3 No Filter Search

Task

Record: 1 of 8 No Filter Search



استاندارد مهارت

خروج اولین آخرین قبلی بعدی چاپ جستجو اصلاح انصراف حذف اضافه نمایش پرستای شغل سابقه

کد شغل: 2603017733037

عنوان شغل: تکسین ارشد برق

توانمندیهای استاندارد مهارت شغل

تسلط	توانایی	آشنایی	
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	تعمیر و تعویض کنبه الکترو موتورها و نگهداری از کنبه قطعات تابلوهای بهماز آب
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	کدینگ قطعات برقی واحد
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	اجرای حکم کارهای برق روشن، ایمنی، اضطراری و 55
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	آشنایی با اصول دیجیتال
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	اصول الکترونیک و الکترونیک صنعتی
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	سرویس و نگهداری تجهیزات ابزار دقیق
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	توانایی عیب یابی و تعمیر و سرویس و نگهداری شبکه مخابراتی و نصب سیستم های تلفن و بیسیم
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	توانایی انجام اصلاحات و توسعه در مدارهای فرمان و کنترل

Record: 13 of 13 No Filter Search

Results of this project



reducing of Job replacement from %21to 15.5%



increasing Job satisfaction from %65to 73.3%



increasing Job fitness from %46 to 63%



Change Quality work life of human resource from 33 to 42%



Balance of human resource from 41% to 68%





University of
Zurich^{UZH}



Shahid Beheshti
University



University of Zurich



Shahid Beheshti University



Thanks for your time