

## Competency Questions for OBC-ONTO with Example Answers from Instances

The table describe the competency questions, presented alongside the OBE principles associated with each question (CoF for Clarity of Focus, BD for Backward Design, EO for Extended Opportunity, HE for High Expectation).

No	Question	Principle
1	What is the name of the study program? What is the program's vision and mission?	-
2	Describe the curriculum owned by the study program	-
3	Describe the Program Educational Objectives (PEO) of the study program.	CoF
4	Describe the Program Learning Outcomes (PLO) of the study program.	CoF
5	Describe references used in curriculum development, including: <ul style="list-style-type: none"> <li>• International/regional/national accreditation bodies (if applicable)</li> <li>• Reference documents, such as international standard curriculum, national standard curriculum, document consist of stakeholders' input, alumni survey report, relevant document from benchmark institution.</li> </ul>	CoF
6	Outline the mapping of the national quality framework within the PEO or PLO (including framework level, knowledge element, working skill element, authority and responsibility element).	CoF
7	Describe the domain (cognitive, affective, psychomotor) associated with each PLO.	CoF
8	Describe the mapping between PEO and PLO.	CoF
9	Describe the mapping between PLOs and courses within the curriculum.	BD
10	Describe the Course Learning Outcomes (CLO) within the curriculum	CoF, BD
11	Describe the components of each CLO (Condition, Action, Content, Criteria).	CoF
12	Describe the domain (cognitive, affective, psychomotor) associated with each CLO.	CoF
13	Describe the knowledge category of each CLO (e.g., Factual, Conceptual, Procedural, Metacognitive).	CoF
14	Describe alignment between PLO and CLO mappings.	BD

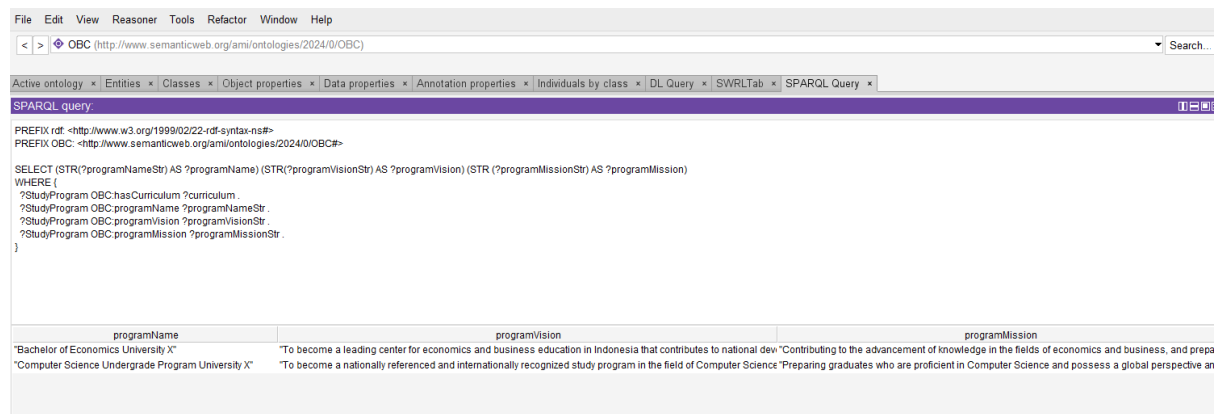
15	Describe the mapping between PLO, learning activities, performance indicators, and appropriate assessment types for each PLO.	BD, HE, EO
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## Q1. What is the name of the study program with this curriculum? What is the program's vision and mission?

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```
SELECT (STR(?programNameStr) AS ?programName) (STR(?programVisionStr) AS
?programVision) (STR (?programMissionStr) AS ?programMission)
WHERE {
  ?StudyProgram OBC:hasCurriculum ?curriculum .
  ?StudyProgram OBC:programName ?programNameStr .
  ?StudyProgram OBC:programVision ?programVisionStr .
  ?StudyProgram OBC:programMission ?programMissionStr .
}
```



The screenshot shows a SPARQL query interface with the following query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

SELECT (STR(?programNameStr) AS ?programName) (STR(?programVisionStr) AS ?programVision) (STR (?programMissionStr) AS ?programMission)
WHERE {
  ?StudyProgram OBC:hasCurriculum ?curriculum .
  ?StudyProgram OBC:programName ?programNameStr .
  ?StudyProgram OBC:programVision ?programVisionStr .
  ?StudyProgram OBC:programMission ?programMissionStr .
}
```

The results table is as follows:

programName	programVision	programMission
"Bachelor of Economics University X"	"To become a leading center for economics and business education in Indonesia that contributes to national dev"	"Contributing to the advancement of knowledge in the fields of economics and business, and prepa
"Computer Science Undergrade Program University X"	"To become a nationally referenced and internationally recognized study program in the field of Computer Science"	"Preparing graduates who are proficient in Computer Science and possess a global perspective an

## Q2. Describe the curriculum owned by the study program

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```
SELECT (STR(?curriculumNameStr) AS ?curriculumName) (STR(?curriculumStartDateStr) AS
?curriculumStartDate) (STR(?programNameStr) AS ?programName)
WHERE {
  ?curriculum OBC:curriculumName ?curriculumNameStr .
  ?curriculum OBC:curriculumStartDate ?curriculumStartDateStr .
  ?curriculum OBC:belongsToSP ?studyProgram .
  ?studyProgram OBC:programName ?programNameStr .
}
```

curriculumName			programName			curriculumStartDate		
"Bachelor of Computer Science Univ X Curr 2020"			"Bachelor of Computer Science University X"			"2020-08-01T00:00:00"		
"Bachelor of Economics UX Curr 2020"			"Bachelor of Economics University X"			"2022-08-01T00:00:00"		

### Q3 Describe the Program Educational Objectives (PEO) of the study program.

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```
SELECT (STR(?programNameStr) AS ?programName) (STR(?curriculumNameStr) AS
?CurriculumName) ?PEO (STR(?DescriptionStr) AS ?Description)
WHERE {
    ?PEO OBC:belongsToCurr ?Curriculum .
    ?PEO OBC:description ?DescriptionStr .
    ?Curriculum OBC:belongsToSP ?SP.
    ?Curriculum OBC:curriculumName ?curriculumNameStr .
    ?SP OBC:programName ?programNameStr .
}
```

programName				CurriculumName				PEO				Description			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PLO_2_1				"Students are able to demonstrate an adequate understanding of major issues in global society"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PLO_B1				"Students are able to explain basic theories of business and general management"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PEO_2				"Students are aware of the global societal environment and its relationship to local society"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PLO_1_2				"Students are sensitive to cultural diversities and to the impact on societies and environment"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PEO_5				"Students demonstrate knowledge in theories of economics"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PLO_B2				"Students are able to demonstrate knowledge in Basic Economics"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PLO_5_1				"Students are able to demonstrate knowledge in theories of Economics"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PEO_1				"Students are aware of ethics and social responsibility"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PEO_4				"Students are able to demonstrate critical and integrative thinking"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PLO_1_1				"Students are able to demonstrate knowledge of relevant social and ethical considerations"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PLO_B3				"Students are able to demonstrate knowledge in Cooperative"			
"Bachelor of Economics University X"				"Bachelor of Economics UX Curr 2020"				PEO_3				"Students have good communication skill"			

### Q4. Describe the Program Learning Outcomes (PLO) of the study program.

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```

SELECT (STR(?programNameStr) AS ?programName) (STR(?curriculumNameStr) AS
?CurriculumName) ?PLO (STR(?DescriptionStr) AS ?Description)
WHERE {
    ?PLO OBC:partOf ?PEO .
    ?PEO OBC:belongsToCurr ?Curriculum .
    ?PLO OBC:description ?DescriptionStr .
    ?Curriculum OBC:belongsToSP ?SP.
    ?Curriculum OBC:curriculumName ?curriculumNameStr .
    ?SP OBC:programName ?programNameStr .
    FILTER (?programNameStr = "Bachelor of Economics University X"^^xsd:string)
}

```

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PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```

SELECT (STR(?programNameStr) AS ?programName) (STR(?curriculumNameStr) AS
?CurriculumName) (STR(?PLOStr) AS ?PLO) (STR(?DescriptionStr) AS ?Description)
WHERE {
    ?PRG rdf:type OBC:ProgramLearningOutcome .
    ?PRG OBC:belongsToCurr ?Curriculum .
    ?PRG OBC:label ?PLOStr .
    ?PRG OBC:description ?DescriptionStr .
    ?Curriculum OBC:belongsToSP ?SP.
    ?Curriculum OBC:curriculumName ?curriculumNameStr .
    ?SP OBC:programName ?programNameStr .
}

```

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< > OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)			
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x			
SPARQL query:			
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> PREFIX owl: <http://www.w3.org/2002/07/owl#> PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> PREFIX xsd: <http://www.w3.org/2001/XMLSchema#> PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>			
SELECT (STR(?programNameStr) AS ?programName) (STR(?curriculumNameStr) AS ?CurriculumName) ?PEO (STR(?DescriptionStr) AS ?Description) WHERE { ?PEO rdf:type OBC:ProgramEducationalObjective . ?PEO OBC:belongsToCurr ?Curriculum . ?PEO OBC:description ?DescriptionStr . ?Curriculum OBC:belongsToSP ?SP . ?Curriculum OBC:curriculumName ?curriculumNameStr . ?SP OBC:programName ?programNameStr . FILTER (?programNameStr = "Bachelor of Economics University X"^^xsd:string) }			
programName	CurriculumName	PEO	Description
"Bachelor of Economics University X"	"Bachelor of Economics UX Curr 2020"	PEO_2	"Students are aware of the global societal environment and its relationship to local society"
"Bachelor of Economics University X"	"Bachelor of Economics UX Curr 2020"	PEO_5	"Students demonstrate knowledge in theories of economics"
"Bachelor of Economics University X"	"Bachelor of Economics UX Curr 2020"	PEO_1	"Students are aware of ethics and social responsibility"
"Bachelor of Economics University X"	"Bachelor of Economics UX Curr 2020"	PEO_4	"Students are able to demonstrate critical and integrative thinking"
"Bachelor of Economics University X"	"Bachelor of Economics UX Curr 2020"	PEO_3	"Students have good communication skill"
"Bachelor of Economics University X"	"Bachelor of Economics UX Curr 2020"	PEO_6	"Students are able to apply advanced quantitative methods by using appropriate tools"
"Bachelor of Economics University X"	"Bachelor of Economics UX Curr 2020"	PEO_B	"Students understand basic business and economic concept"

**Q5. Specify references used in curriculum development, including:**

- **International/regional/national accreditation bodies (if applicable)**

- **Reference document, such as international standard curriculum, national standard curriculum, minutes of meeting from FGD with stakeholders, alumni survey document, curriculum document from benchmark institution.**

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX obc: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```
SELECT (STR(?curriculumNameStr) AS ?curriculumName) ?accreditationName
(STR(?referenceTitleStr) AS ?referenceTitle) (STR(?issuedByStr) AS ?issuedBy)
WHERE {
    # Retrieve curriculum information
    ?curriculum rdf:type obc:Curriculum .
    ?curriculum obc:curriculumName ?curriculumNameStr .

    # Link to accreditation bodies (if applicable)
    OPTIONAL {
        ?curriculum obc:referTo ?accreditationOrg .
        ?accreditationOrg rdf:type obc:AccreditationOrganization .
        ?accreditationOrg obc:accreditationName ?accreditationName .
        ?accreditationOrg obc:fieldOfApplication ?fieldOfApplication .
    }

    # Link to reference documents used in curriculum development
    OPTIONAL {
        ?curriculum obc:referTo ?referenceDoc .
        ?referenceDoc rdf:type obc:ReferenceDocument .
        ?referenceDoc obc:documentTitle ?referenceTitleStr .
        ?referenceDoc obc:documentType ?referenceType .
        ?referenceDoc obc:issuedBy ?issuedByStr .
        ?referenceDoc obc:url ?url .
    }
}
```

ORDER BY ?curriculumName ?accreditationName ?referenceTitle

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 OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)

Active ontology

Entities

Classes

Object properties

Data properties

Annotation properties

Individuals by class

DL Query

SWRLTab

SPARQL Query

SPARQL query

```
?accreditationOrg obc:accreditationName ?accreditationName .
?accreditationOrg obc:fieldOfApplication ?fieldOfApplication .
}

# Link to reference documents used in curriculum development
OPTIONAL {
  ?curriculum obc:referTo ?referenceDoc .
  ?referenceDoc rdf:type obc:ReferenceDocument .
  ?referenceDoc obc:documentTitle ?referenceTitleStr .
  ?referenceDoc obc:documentType ?referenceType .
  ?referenceDoc obc:issuedBy ?issuedByStr .
  ?referenceDoc obc:url ?url .
}
}

ORDER BY ?curriculumName ?accreditationName ?referenceTitle
```

curriculumName	accreditationName	referenceTitle	issuedBy
"Bachelor of Computer Science Univ X Curr 2020"		"ACM Computing Curricula 2020"	"ACM"
"Bachelor of Economics UX Curr 2020"	"AACSB (Association to Advance Collegiate Schools of Business)"		

**Q6. Outline the mapping of the national quality framework within the PEO or PLO (including framework level, knowledge element, working skill element, authority and responsibility element).**

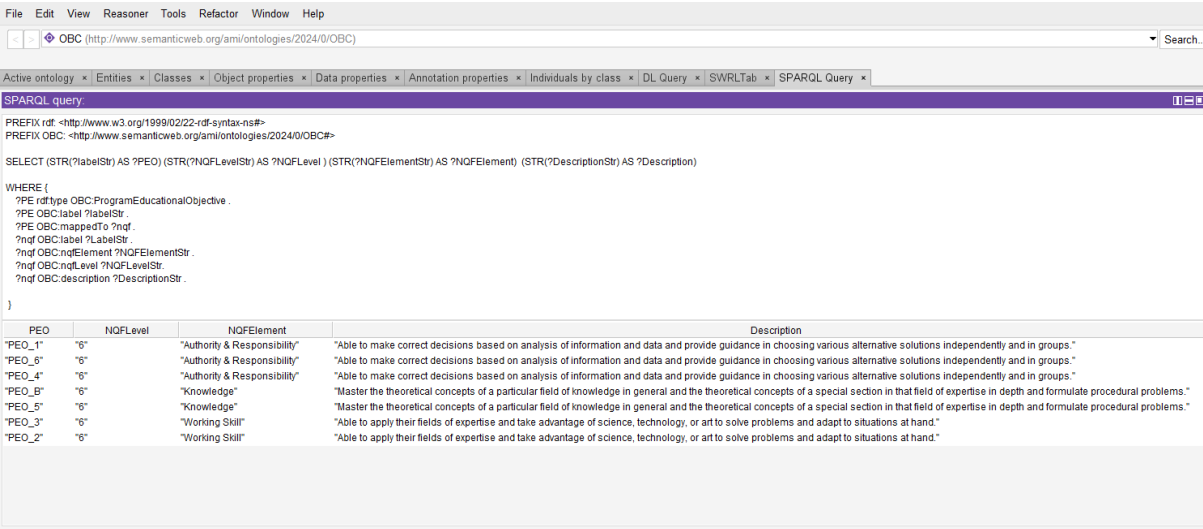
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```
#SELECT (STR(?labelStr) AS ?PEO) (STR (?LabelStr) AS ?MapToNQF) (STR(?DescriptionStr) AS
?Description)
SELECT (STR(?labelStr) AS ?PEO) (STR(?NQFElementStr) AS ?NQFElement) (STR(?NQFLevelStr)
AS ?NQFLevel ) (STR(?DescriptionStr) AS ?Description)

WHERE {
    ?PE rdf:type OBC:ProgramEducationalObjective .
    ?PE OBC:label ?labelStr .
    ?PE OBC:mappedTo ?nqf .
    ?nqf OBC:label ?LabelStr .
    ?nqf OBC:nqfElement ?NQFElementStr .
    ?nqf OBC:nqfLevel ?NQFLevelStr.
    ?nqf OBC:description ?DescriptionStr .

}
```



**Q7. Describe the domain (cognitive, affective, psychomotor) associated with each PLO.**

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>  
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>  
PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```
SELECT (STR(?label_PLO) AS ?PLO) (STR(?desc) AS ?Description) (STR(?label_Domain) AS
?Domain)
WHERE {

    ?plo rdf:type OBC:ProgramLearningOutcome . # Mengubah menjadi
OBC:ProgramLearningOutcome

    ?plo OBC:label ?label_PLO .
    ?plo OBC:description ?desc .
```

```
?plo OBC:hasDomain ?Domain_PLO .
?Domain_PLO OBC:label ?label_Domain .
```

```
}
```

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< > OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)			
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x			
SPARQL query:			
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#> PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>			
SELECT (STR(?label_PLO) AS ?PLO) (STR(?desc) AS ?Description) (STR(?label_Domain) AS ?Domain) WHERE {			
?plo rdf:type OBC:ProgramLearningOutcome . # Mengubah menjadi OBC:ProgramLearningOutcome			
?plo OBC:label ?label_PLO .			
?plo OBC:description ?desc .			
?plo OBC:hasDomain ?Domain_PLO .			
?Domain_PLO OBC:label ?label_Domain .			
}			
ORDER BY ?plo			
PLO	Description	Domain	
"PLO_1_1"	"Students are able to demonstrate knowledge of relevant social and ethical considerations"	"C2_Understand"	
"PLO_2_1"	"Students are able to demonstrate an adequate understanding of major issues in global society"	"C2_Understand"	
"PLO_2_2"	"Students are able to demonstrate understanding of local issues and its relationship to global issue"	"C2_Understand"	
"PLO_3_1"	"Students are able to communicate clearly and concisely in presentation and discussion"	"C3_Apply"	
"PLO_3_2"	"Students are able to write a clear and concise essay/report"	"C3_Apply"	
"PLO_4_1"	"Students are able to analyse and draw conclusions supported by appropriate evidence"	"C4_Analyse"	
"PLO_5_1"	"Students are able to demonstrate knowledge in theories of Economics"	"C2_Understand"	
"PLO_5_2"	"Students are able to apply basic theories of Finance & Financial Management"	"C3_Apply"	
"PLO_6_1"	"Students are able to apply basic quantitative methods by using appropriate tools"	"C3_Apply"	
"PLO_B1"	"Students are able to explain basic theories of business and general management"	"C2_Understand"	
"PLO_B2"	"Students are able to demonstrate knowledge in Basic Economics"	"C2_Understand"	
"PLO_B3"	"Students are able to demonstrate knowledge in Cooperative"	"C2_Understand"	

## Q8. Describe the mapping between PEO and PLO.

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>
```

```
SELECT (STR(?label_peo) AS ?PEO) (STR(?desc_peo) AS ?PEO_Description) (STR(?label_PLO)
AS ?PLO) (STR(?desc_plo) AS ?PLO_Description)
```

```
WHERE {
```

```
    ?plo rdf:type OBC:ProgramLearningOutcome .
    ?peo rdf:type OBC:ProgramEducationalObjective .
```

```
    ?plo OBC:partOf ?peo .
```

```
    ?plo OBC:label ?label_PLO .
    ?plo OBC:description ?desc_plo .
```

```
    ?peo OBC:label ?label_peo .
    ?peo OBC:description ?desc_peo .
```

```
# FILTER(?label_peo = "PEO_B"^^xsd:string)
```

```
}
```

```
ORDER BY ?label_peo
```

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OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)			
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x			
SPARQL query:			
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> PREFIX xsd: <http://www.w3.org/2001/XMLSchema#> PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>  SELECT (STR(?label_peo) AS ?PEO) (STR(?desc_peo) AS ?PEO_Description) (STR(?label_PLO) AS ?PLO) (STR(?desc_plo) AS ?PLO_Description)  WHERE {  ?plo rdfs:type OBC:ProgramLearningOutcome . ?peo rdfs:type OBC:ProgramEducationalObjective .  ?plo OBC:partOf ?peo .  ?plo OBC:label ?label_PLO . ?plo OBC:description ?desc_plo . }			
PEO	PEO_Description	PLO	PLO_Description
"PEO_1"	"Students are aware of ethics and social responsibility"	"PLO_1_2"	"Students are sensitive to cultural diversities and to the impact on societies and environment"
"PEO_1"	"Students are aware of ethics and social responsibility"	"PLO_1_1"	"Students are able to demonstrate knowledge of relevant social and ethical considerations"
"PEO_2"	"Students are aware of the global societal environment and its relationship to local society"	"PLO_2_1"	"Students are able to demonstrate an adequate understanding of major issues in global society"
"PEO_2"	"Students are aware of the global societal environment and its relationship to local society"	"PLO_2_2"	"Students are able to demonstrate understanding of local issues and its relationship to global issue"
"PEO_3"	"Students have good communication skill"	"PLO_3_2"	"Students are able to write a clear and concise essay/report"
"PEO_3"	"Students have good communication skill"	"PLO_3_1"	"Students are able to communicate clearly and concisely in presentation and discussion"
"PEO_4"	"Students are able to demonstrate critical and integrative thinking"	"PLO_4_1"	"Students are able to analyse and draw conclusions supported by appropriate evidence"
"PEO_5"	"Students demonstrate knowledge in theories of economics"	"PLO_5_2"	"Students are able to apply basic theories of Finance & Financial Management"
"PEO_5"	"Students demonstrate knowledge in theories of economics"	"PLO_5_1"	"Students are able to demonstrate knowledge in theories of Economics"
"PEO_6"	"Students are able to apply advanced quantitative methods by using appropriate tools"	"PLO_6_1"	"Students are able to apply basic quantitative methods by using appropriate tools"
"PEO_B"	"Students understand basic business and economic concept"	"PLO_B2"	"Students are able to demonstrate knowledge in Basic Economics"
"PEO_B"	"Students understand basic business and economic concept"	"PLO_B4"	"Students are able to apply accounting principles to transactions and other events"

## Q9. Describe the mapping between PLOs and courses within the curriculum.

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX owl: <http://www.w3.org/2002/07/owl#>

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

SELECT (STR(?label\_PLO) AS ?PLO) (STR(?desc\_plo) AS ?PLO\_Description) (STR(?c\_name) AS ?Course\_Name)

WHERE {

  ?plo rdf:type OBC:ProgramLearningOutcome . # Mengubah menjadi  
OBC:ProgramLearningOutcome

  ?c rdf:type OBC:Course .

  ?c OBC:hasPLO ?plo .

  ?plo OBC:label ?label\_PLO .

  ?plo OBC:description ?desc\_plo .

  ?c OBC:courseName ?c\_name .

}

ORDER BY ?label\_PLO



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OBC

(http://www.semanticweb.org/ami/ontologies/2024/0/OBC)

Active ontology

Entities

Classes

Object properties

Data properties

Annotation properties

Individuals by class

DL Query

SWRLTab

SPARQL Query

SPARQL query

```
WHERE {  
  
  ?plo rdf:type OBC:ProgramLearningOutcome . # Mengubah menjadi OBC:ProgramLearningOutcome  
  ?c rdf:type OBC:Course .  
  
  ?c OBC:hasPLO ?plo .  
  
  ?plo OBC:label ?label_PLO .  
  ?plo OBC:description ?desc_plo .  
  
  ?c OBC:courseName ?c_name .  
  
}
```

ORDER BY ?label\_PLO

PLO	PLO_Description	Course_Name
"PLO_1_1"	"Students are able to demonstrate knowledge of relevant social and ethical considerations"	"Kepemimpinan"
"PLO_1_1"	"Students are able to demonstrate knowledge of relevant social and ethical considerations"	"MPK Agama"
"PLO_1_1"	"Students are able to demonstrate knowledge of relevant social and ethical considerations"	"Kewirausahaan"
"PLO_1_1"	"Students are able to demonstrate knowledge of relevant social and ethical considerations"	"Manusia sbg Pelaku Ekonomi & Bisnis"
"PLO_1_2"	"Students are sensitive to cultural diversities and to the impact on societies and environment"	"Kepemimpinan"
"PLO_1_2"	"Students are sensitive to cultural diversities and to the impact on societies and environment"	"Manusia sbg Pelaku Ekonomi & Bisnis"
"PLO_1_2"	"Students are sensitive to cultural diversities and to the impact on societies and environment"	"Kewirausahaan"
"PLO_2_1"	"Students are able to demonstrate an adequate understanding of major issues in global society"	"Ekonomi Moneter"
"PLO_2_1"	"Students are able to demonstrate an adequate understanding of major issues in global society"	"Ekonomi Internasional"
"PLO_2_2"	"Students are able to demonstrate understanding of local issues and its relationship to global issue"	"Ekonomi Moneter"
"PLO_2_2"	"Students are able to demonstrate understanding of local issues and its relationship to global issue"	"Ekonomi Internasional"
"PLO_2_2"	"Students are able to demonstrate understanding of local issues and its relationship to global issue"	"MPK Terintegrasi"

## Q10. Specify the Course Learning Outcomes (CLO) within the curriculum.

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX owl: <http://www.w3.org/2002/07/owl#>

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```

SELECT DISTINCT (STR(?curriculumNameStr) AS ?curriculumName) (STR(?label_clo)
AS ?CLO) (STR(?desc_clo) AS ?CLO_Description)
WHERE {

```

```

  ?clo rdf:type OBC:CourseLearningOutcome .

```

```

  ?plo rdf:type OBC:ProgramLearningOutcome .

```

```

  ?clo OBC:partOf ?plo .

```

```

  ?plo OBC:belongsToCurr ?Curriculum .

```

```

  ?Curriculum OBC:curriculumName ?curriculumNameStr .

```

```

  ?clo OBC:label ?label_clo .

```

```

  ?clo OBC:description_eng ?desc_clo .

```

```

  ?domain_clo OBC:label ?domain_clo_label .

```

```

# FILTER(?label_peo = "PEO_B"^^xsd:string)

```

```

}

```

```

ORDER BY ?label_clo

```

File Edit View Reasoner Tools Refactor Window Help		
OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)		
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x		
SPARQL query		
<pre> / clo rdf:type OBC:CourseLearningOutcome . ? plo rdf:type OBC:ProgramLearningOutcome . ? clo OBC:partOf ? plo . ? plo OBC:belongsToCurr ? Curriculum . ? Curriculum OBC:curriculumName ? curriculumNameStr .  ? clo OBC:label ?label_clo . ? clo OBC:description_eng ?desc_clo .  ? domain_clo OBC:label ?domain_clo_label .  # FILTER(?label_peo = "PEO_B"^^xsd:string) } ORDER BY ?label_clo </pre>		
curriculumName	CLO	CLO_Description
"Bachelor of Economics UX Curr 2020"	"CLO_1"	"Able to identify and describe socio-economic phenomena, fostering personal sensitivity"
"Bachelor of Economics UX Curr 2020"	"CLO_10"	"Able to apply inferential statistical methods and regression as tools for economic analysis."
"Bachelor of Economics UX Curr 2020"	"CLO_11"	"Able to use mathematical approaches to analyze economic phenomena from both static and dynamic perspectives."
"Bachelor of Economics UX Curr 2020"	"CLO_12"	"Able to interpret the normative aspects of cooperatives in their empirical practice."
"Bachelor of Economics UX Curr 2020"	"CLO_13"	"Able to demonstrate technical skills and financial analysis in corporate financial management"
"Bachelor of Economics UX Curr 2020"	"CLO_2"	"Able to apply foundational microeconomic theories using simple graphs and mathematics."
"Bachelor of Economics UX Curr 2020"	"CLO_3"	"Able to utilize relevant mathematical concepts and techniques to understand economic concepts and theories through mathematical discussion and solutions."
"Bachelor of Economics UX Curr 2020"	"CLO_4"	"Able to process economic and business data using basic descriptive and inferential statistical methods, including hypothesis testing, probability concepts, and probability distributions"
"Bachelor of Economics UX Curr 2020"	"CLO_5"	"Able to explain fundamental business principles and organizational structures, including the basic principles of each business function."
"Bachelor of Economics UX Curr 2020"	"CLO_6"	"Able to apply generally accepted accounting principles to simple transactions."
"Bachelor of Economics UX Curr 2020"	"CLO_7"	"Able to produce written English summaries, syntheses, and academic paraphrasing from ideas in readings."
"Bachelor of Economics UX Curr 2020"	"CLO_8"	"Able to illustrate simple macroeconomic phenomena using diagrams aligned with basic macroeconomic concepts."

## Q11. Describe the components of each CLO (Condition, Action, Content, Criteria).

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX owl: <http://www.w3.org/2002/07/owl#>

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

SELECT DISTINCT (STR(?label\_clo) AS ?CLO) (STR(?conditionStr) AS ?Condition)

(STR(?actionStr) AS ?Action) ?Content

(STR(?criteriaStr) AS ?Criteria)

WHERE {

?clo rdf:type OBC:CourseLearningOutcome .

?plo rdf:type OBC:ProgramLearningOutcome .

?clo OBC:partOf ?plo .

?plo OBC:belongsToCurr ?Curriculum .

?Curriculum OBC:curriculumName ?curriculumNameStr .

?clo OBC:label ?label\_clo .

OPTIONAL { ?clo OBC:hasContent ?Content . }

?Content rdf:type OBC:SubjectMatter .

OPTIONAL { ?clo OBC:condition ?conditionStr . }

OPTIONAL { ?clo OBC:action ?actionStr . }

# OPTIONAL { ?clo OBC:content ?contentStr . }

OPTIONAL { ?clo OBC:criteria ?criteriaStr . }

# Exclude results where 'action' is missing or empty

FILTER(BOUND(?actionStr))

}

ORDER BY ?label\_clo

File Edit View Reasoner Tools Refactor Window Help				
< > OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)				
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x				
SPARQL query				
<pre> ?do UBC:partOf ?pio . ?pio OBC:belongsToCurr ?Curriculum . ?Curriculum OBC:curriculumName ?curriculumNameStr . ?do OBC:label ?label_clo . OPTIONAL {   ?do OBC:hasContent ?Content .   ?Content rdf:type OBC:SubjectMatter .    OPTIONAL { ?do OBC:condition ?conditionStr . }   OPTIONAL { ?do OBC:action ?actionStr . }   # OPTIONAL { ?do OBC:content ?contentStr . }   OPTIONAL { ?do OBC:criteria ?criteriaStr . }   # Exclude results where 'action' is missing or empty   FILTER(BOUND(?actionStr)) } ORDER BY ?label_clo </pre>				
CLO	Condition	Action	Content	Criteria
"CLO_1"		"Able to identify and describe"	Socio_economics_phenomena	
"CLO_10"	"Given economic data for analysis"	"Able to apply"	Regression_methods	
"CLO_11"		"Able to apply"	Mathematical_concepts_and_techniques	
"CLO_12"	"Given cooperative models in practice"	"Able to interpret"	Normative_aspects_of_cooperative	
"CLO_13"	"Provided with scenarios in corporate finance."	"Able to demonstrate"	Technical_and_financial_analysis_in_corporate_finance.	
"CLO_2"		"Able to apply using graphs and simple mathematics"	Microeconomic_theory_basics	
"CLO_3"		"Able to apply"	Mathematical_concepts_and_techniques	
"CLO_4"	"Provided with economic and business data."	"Able to process data"	Basic_descriptive_and_inferential_statistics	"Accurately explains phenomena reflected in data used."
"CLO_5"		"Able to explain"	Basic_business_principles_and_organizational_structure.	
"CLO_6"	"Provided with simple transactions"	"Able to apply"	Basic_accounting_principles.	
"CLO_7"		"Able to summarize, synthesize, and paraphrase ideas"	Academic_writing_in_English.	
"CLO_8"		"Able to illustrate using diagrams"	Macroeconomic_phenomena.	

## Q12. Specify the domain (cognitive, affective, psychomotor) associated with each CLO.

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>  
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>  
PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

SELECT (STR(?label\_clo) AS ?CLO) (STR(?desc\_clo) AS ?CLO\_Description)  
(STR(?domain\_clo\_label) AS ?CLO\_Domain)

WHERE {

    ?clo rdf:type OBC:CourseLearningOutcome .  
    ?clo OBC:hasDomain ?domain\_clo .

    ?clo OBC:label ?label\_clo .  
    ?clo OBC:description ?desc\_clo .

    ?domain\_clo OBC:label ?domain\_clo\_label .

# FILTER(?label\_peo = "PEO\_B"^^xsd:string)

}

ORDER BY ?label\_clo

File Edit View Reasoner Tools Refactor Window Help			
< > OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)			
Active ontology x   Entities x   Classes x   Object properties x   Data properties x   Annotation properties x   Individuals by class x   DL Query x   SWRLTab x   SPARQL Query x			
SPARQL query:			
<pre> ?clo rdf:type OBC:CourseLearningOutcome . ?clo OBC:hasDomain ?domain_clo .  ?clo OBC:label ?label_clo . ?clo OBC:description_eng ?desc_clo .  ?domain_clo OBC:label ?domain_clo_label .  # FILTER(?label_peo = "PEO_B"^^xsd:string)  }  ORDER BY ?label_clo </pre>			
CLO	CLO_Description	CLO_Domain	
"CLO_1"	"Able to identify and describe socio-economic phenomena, fostering personal sensitivity"	"C2_Understand"	
"CLO_10"	"Able to apply inferential statistical methods and regression as tools for economic analysis."	"C3_Apply"	
"CLO_11"	"Able to use mathematical approaches to analyze economic phenomena from both static and dynamic perspectives."	"C4_Analyse"	
"CLO_12"	"Able to interpret the normative aspects of cooperatives in their empirical practice."	"C5_Evaluate"	
"CLO_13"	"Able to demonstrate technical skills and financial analysis in corporate financial management."	"C4_Analyse"	
"CLO_2"	"Able to apply foundational microeconomic theories using simple graphs and mathematics."	"C3_Apply"	
"CLO_3"	"Able to utilize relevant mathematical concepts and techniques to understand economic concepts and theories through mathematical discussion and solutions."	"C3_Apply"	
"CLO_5"	"Able to explain fundamental business principles and organizational structures, including the basic principles of each business function."	"C2_Understand"	
"CLO_6"	"Able to apply generally accepted accounting principles to simple transactions."	"C3_Apply"	
"CLO_7"	"Able to produce written English summaries, syntheses, and academic paraphrasing from ideas in readings."	"C4_Analyse"	
"CLO_8"	"Able to illustrate simple macroeconomic phenomena using diagrams aligned with basic macroeconomic concepts."	"C3_Apply"	
"CLO_9"	"Able to analyze the effectiveness of management processes with a focus on business organizations."	"C4_Analyse"	

### Q13. Describe the knowledge category of each CLO (e.g., Factual, Conceptual, Procedural, Metacognitive).

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>  
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>  
PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

SELECT (STR(?label\_clo) AS ?CLO) ?content ?knowledgeCategory

```

WHERE {
  # Mengambil CLO dan labelnya
  ?clo rdf:type OBC:CourseLearningOutcome .

  ?clo OBC:label ?label_clo .
  ?clo OBC:hasContent ?content .

  # Mengambil kategori pengetahuan dari CLO
  ?content OBC:hasKnowledgeCategory ?knowledgeCategory .
#  ?knowledgeCategory rdfs:label ?knowledgeCategoryLabel .
}
ORDER BY ?label_clo

```

File Edit View Reasoner Tools Refactor Window Help			
< > OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)			
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x			
SPARQL query			
<pre> SELECT (STR(?label_clo) AS ?CLO) ?content ?knowledgeCategory WHERE {   # Mengambil CLO dan labelnya   ?clo rdf:type OBC:CourseLearningOutcome .    ?clo OBC:label ?label_clo .   ?clo OBC:hasContent ?content .    # Mengambil kategori pengetahuan dari CLO   ?content OBC:hasKnowledgeCategory ?knowledgeCategory .   # ?knowledgeCategory rdfs:label ?knowledgeCategoryLabel . } ORDER BY ?label_clo </pre>			
CLO	content	knowledgeCategory	
*CLO_1*	Socio_economics_phenomena	Conceptual	
*CLO_10*	Regression_methods.	Procedural	
*CLO_11*	Mathematical_concepts_and_techniques	Procedural	
*CLO_12*	Normative_aspects_of_cooperative.	Conceptual	
*CLO_13*	Technical_and_financial_analysis_in_corporate_finance.	Procedural	
*CLO_2*	Microeconomic_theory_basics	Procedural	
*CLO_3*	Mathematical_concepts_and_techniques	Procedural	
*CLO_4*	Basic_descriptive_and_inferential_statistics	Procedural	
*CLO_5*	Basic_business_principles_and_organizational_structure.	Factual	
*CLO_5*	Basic_business_principles_and_organizational_structure.	Conceptual	
*CLO_6*	Basic_accounting_principles.	Procedural	
*CLO_7*	Academic_writing_in_English.	Meta_Cognitive	

#### Q14. Describe alignment between PLO and CLO mappings.

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX owl: <http://www.w3.org/2002/07/owl#>

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

```

SELECT (STR(?label_plo) AS ?PLO) (STR(?desc_plo) AS ?PLO_Description)
(STR(?domain_plo_label) AS ?PLO_Domain) (STR(?label_clo) AS ?CLO) (STR(?desc_clo)
AS ?CLO_Description) (STR(?domain_clo_label) AS ?CLO_Domain)

```

WHERE {

```

    ?plo rdf:type OBC:ProgramLearningOutcome . # Mengubah menjadi
OBC:ProgramLearningOutcome

```

```

    ?clo rdf:type OBC:CourseLearningOutcome .

```

```

    ?clo OBC:partOf ?plo .

```

```

    ?plo OBC:hasDomain ?domain_plo .

```

```

    ?clo OBC:hasDomain ?domain_clo .

```

```

    ?plo OBC:label ?label_plo .

```

```

    ?plo OBC:description ?desc_plo .

```

```

    ?domain_plo OBC:label ?domain_plo_label .

```

```

    ?clo OBC:label ?label_clo .

```

```

    ?clo OBC:description_eng ?desc_clo .

```

?domain\_clo OBC:label ?domain\_clo\_label .

# FILTER(?label\_peo = "PEO\_B"^^xsd:string)

}

ORDER BY ?label\_plo

File Edit View Reasoner Tools Refactor Window Help						
OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)						
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x						
SPARQL query						
run query						
?plo OBC:hasDomain ?domain_plo .						
?do OBC:hasDomain ?domain_clo .						
?plo OBC:label ?label_plo .						
?plo OBC:description ?desc_plo .						
?domain_plo OBC:label ?domain_plo_label .						
?do OBC:label ?label_clo .						
?do OBC:description_eng ?desc_clo .						
?domain_clo OBC:label ?domain_clo_label .						
# FILTER(?label_peo = "PEO_B"^^xsd:string)						
PLO	PLO_Description	PLO_Domain	CLO	CLO_Description	CLO_Domain	
"PLO_1_1"	"Students are able to demonstrate knowledge of relevant social and ethical considerations"	"C2_Understand"	"CLO_1"	"Able to identify and describe socio-economic phenomena, fostering personal sensitivity"	"C2_Understand"	
"PLO_2_1"	"Students are able to demonstrate an adequate understanding of major issues in global society"	"C2_Understand"	"CLO_1"	"Able to identify and describe socio-economic phenomena, fostering personal sensitivity"	"C2_Understand"	
"PLO_3_2"	"Students are able to write a clear and concise essay/report"	"C3_Apply"	"CLO_7"	"Able to produce written English summaries, syntheses, and academic paraphrasing from ide"	"C4_Analyse"	
"PLO_5_2"	"Students are able to apply basic theories of Finance & Financial Management"	"C3_Apply"	"CLO_13"	"Able to demonstrate technical skills and financial analysis in corporate financial managemen"	"C4_Analyse"	
"PLO_6_1"	"Students are able to apply basic quantitative methods by using appropriate tools"	"C3_Apply"	"CLO_10"	"Able to apply inferential statistical methods and regression as tools for economic analysis."	"C3_Apply"	
"PLO_6_1"	"Students are able to apply basic quantitative methods by using appropriate tools"	"C3_Apply"	"CLO_11"	"Able to use mathematical approaches to analyze economic phenomena from both static and"	"C4_Analyse"	
"PLO_6_1"	"Students are able to apply basic quantitative methods by using appropriate tools"	"C3_Apply"	"CLO_3"	"Able to utilize relevant mathematical concepts and techniques to understand economic conce"	"C3_Apply"	
"PLO_B1"	"Students are able to explain basic theories of business and general management"	"C2_Understand"	"CLO_5"	"Able to explain fundamental business principles and organizational structures, including the l"	"C2_Understand"	
"PLO_B1"	"Students are able to explain basic theories of business and general management"	"C2_Understand"	"CLO_9"	"Able to analyze the effectiveness of management processes with a focus on business organi"	"C4_Analyse"	
"PLO_B2"	"Students are able to demonstrate knowledge in Basic Economics"	"C2_Understand"	"CLO_2"	"Able to apply foundational microeconomic theories using simple graphs and mathematics."	"C3_Apply"	
"PLO_B2"	"Students are able to demonstrate knowledge in Basic Economics"	"C2_Understand"	"CLO_8"	"Able to illustrate simple macroeconomic phenomena using diagrams aligned with basic ma"	"C3_Apply"	
"PLO_B3"	"Students are able to demonstrate knowledge in Cooperative"	"C2_Understand"	"CLO_12"	"Able to interpret the normative aspects of cooperatives in their empirical practice."	"C5_Evaluate"	

**Q15. Describe the mapping between PLO, teaching learning activity, media or technology, performance indicator, and appropriate assessment types for each PLO.**

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX owl: <http://www.w3.org/2002/07/owl#>

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

PREFIX OBC: <http://www.semanticweb.org/ami/ontologies/2024/0/OBC#>

SELECT DISTINCT (STR (?plo\_label) as ?PLO) (STR (?sub\_plo\_label) as ?Sub\_PLO) (STR (?la\_label) as ?Learning\_Activity) (STR (?sm\_desc) as ?Subject\_Matter) (STR (?course\_name) as ?Course) (STR (?media\_name) as ?Media\_Or\_Technology) (STR (?asm\_method) as ?Assessment\_Method) (STR (?pi\_desc) as ?Performance\_Indicator)

WHERE {

?plom rdf:type OBC:PLOMapping .

?la rdf:type OBC:LearningActivity .

?asm rdf:type OBC:Assessment .

?pi rdf:type OBC:PerformanceIndicator .

?mt rdf:type OBC:MediaOrTechnology .

?sm rdf:type OBC:SubjectMatter .

?plom OBC:definesFor ?sub\_plo .

?sub\_plo OBC:label ?sub\_plo\_label .

```

?sub_plo OBC:partOf ?plo .
?plo OBC:label ?plo_label .

?plom OBC:isAcheivedVia ?la .
?la OBC:activityName ?la_label .

?plom OBC:hasContent ?sm .
?sm OBC:description ?sm_desc .

?plom OBC:hasCourse ?course .
?course OBC:courseName ?course_name .

?plom OBC:requiresMediaOf ?mt .
?mt OBC:mediaName ?media_name.

?plom OBC:assessedThrough ?asm .
?asm OBC:assessmentMethod ?asm_method.

?plom OBC:measuredBy ?pi .
?pi OBC:description ?pi_desc.
}

```

File Edit View Reasoner Tools Refactor Window Help								
OBC (http://www.semanticweb.org/ami/ontologies/2024/0/OBC)								
Active ontology x Entities x Classes x Object properties x Data properties x Annotation properties x Individuals by class x DL Query x SWRLTab x SPARQL Query x								
SPARQL query								
SELECT DISTINCT (STR(?plo_label) as ?PLO) (STR(?sub_plo_label) as ?Sub_PLO) (STR(?la_label) as ?Learning_Activity) (STR(?sm_desc) as ?Subject_Matter) (STR(?course_name) as ?Course) (STR(?media_name) as ?Media_Or_Technology) (STR(?asm_method) as ?Assessment_Method) (STR(?pi_desc) as ?Performance_Indicator)								
WHERE { ?plom rdt:OBCPLOMapping . ?la rdt:OBCLearningActivity . ?asm rdt:OBCAssessment . ?pi rdt:OBCPerformanceIndicator . ?mt rdt:OBCMediaOrTechnology . ?sm rdt:OBCSubjectMatter .  ?plom OBC:definesFor ?sub_plo . ?sub_plo OBC:label ?sub_plo_label . ?sub_plo OBC:partOf ?plo . }								
PLO	Sub_PLO	Learning_Activity	Subject_Matter	Course	Media_Or_Technology	Assessment_Method	Performance_Indicator	
"PLO_1_1"	"SubPLO_1_1_1"	"Discussing articles or news about ethics"	"The nature of ethics"	"Ethics and Sustainability"	"Modern classroom"	"Reflective essay"	"Students are able to explain the nature of ethics"	