Unit Planning Outlines

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1. Program Introduction

This unit lays foundations in a number of areas. It can be expected to take the first 2 weeks.

Technical Topics

Introductions to Engineering, Engineering Technology, Earth Sciences

Sample learning tasks

- Interview and introduce a classmate.
- Participate in other class ice-breakers.
- Introduce instructor.
- Participate in course overview.
- Set rules of the road.
- Identify professional disciplines in the group.
- Compare and contrast NOC skills descriptions to identify common skill clusters.
- Form expert groups to compare and contrast areas of sub-specialization.
- Discuss Bloom's taxonomy as a way of improving questioning.
- Present a brief group presentation on shared skills and disciplines.

Strategies

Active vs. passive learning

- Active learning vs. the Funnel Approach
- Active learning and retention rates
    - Learning pyramid: percentages of recall – lectures vs. hands-on
    - READ, p.79: The curve of Forgetting
    - TCH, Unit 1.9: SQ3R
- Learning as a tree or web
- Setting goals: SMART goals

Learning styles and strategies:

- Online learning style inventory.
- R.E.A.D, Chapter 1: "You, the Reader, Building Your Own Future"
- Binders and organization.
- Online audio chat: and online quiz Language learning and learning styles (Expert, interviewed.): http://esl-lab.com/learn/learnrd1.htm
- Learning journals.

Conversation management:

- managing the flow of information in the classroom
- indicating non-comprehension and partial comprehension

Code-switching to solve a comprehension problem.

- Flowchart a decision making process for variables such as noise, context, etc.

Paraphrasing.

Functions & Gambits

Introducing oneself, a third party.
Introducing another more formally to a group.
Asking for and reporting information.

Identifying people, occupations, places.
Remembering (as I recall, if I remember, correctly, etc.)
Talking about yourself, starting a conversation, making a date.
Describing personal qualities.
Talking about professions.
Disagreeing: shadings and alternatives: a progression. Note: "Presenting an alternative," in particular, works well with categorizing exercises, since two analyses using different categories may produce results that are equally valid.

1. Acknowledging a point.
2. Presenting an alternative perspective (without using "but")
3. Expressing reservations / doubts
4. Conceding a point, to make another
5. Disagreeing

Other competencies

Instructions

- Total Physical Response: using geographical figures.
- Directions from school to one's home.

Grammar focus / review

Grammar assessment

- tenses
- sentence mechanics
    - EBC; Grammar Handbook Test

Question formation.
Prepositions of location for country, city: in, on, at.
Listing
Defining
Classifying

- T&L, section 2
- Note: Classification emerges as a natural application for certain functions: presenting an alternative point of view (as opposed to disagreeing)

Relative Pronouns:

- *A Focus on Grammar*
- Sentence combining activities.
- TSU, Unit 1: Subject-Verb Agreement, Past tense review, 35-40

Comparatives: adjectives
Adjectives: personal qualities
Simple past tense; present perfect.
There is / there are
BE + adjective
BE + article + noun
Passive Voice

- TWO, The Passive Voice: Who's in Charge, Anyway?, pp.89-92
- FOG, Unit: The Passive Voice

Structures, focus areas

Rhetorical pattern	**Constructions**
General to specific	
Technical discourse features	
Definitions	• 3rd person pronoun: it

Physical description	• Category: a type/sort/species of
	  ○ logical: consists of / can be subdivided / can be divided into X subcategories / is composed of / comprises
	  ○ can be recognized by // …

	• Relative pronoun: that / which // whose
	• Defining characteristics
Cognitive / taxonomic	• Such as // for example // for instance
Knowledge level questioning and verb use.	• As follows / the following
Giving examples	• Mentioned above / below
Announcing a list	• Is called / is referred to as
Use of colon for lists	• Can be found in
Naming, labelling	
Locating / situating	
Type of Processing / Purposive	
Identify	• Can be recognized by
Sort: Talking about categories	• Has a number of distinguishing characteristics
Define	• A type / sort / species of
Describe	
Type of Information	
Nouns	• Noun phrases
Specific characteristics	• Adjective phrases
Type of Match	
Locate	

Vocabulary Development

Oxford list of common technical terms.

Pronunciation

Pronunciation as problem solving.

Employability, sectoral knowledge, workplace culture

Present Conference Board Employability Skills as a basis for self-evaluation.
Business communications: listening skills, body language, cultural clues

- EBC, Chapter 1: "Facing Today's Communications Challenges"

Skill focus: Develops positive attitudes toward personal growth and career development.

- STEPS, Unit 1: General Duties of Engineering Technologists and Technicians.

Essential Skills

Problem-solving, decision making, critical thinking.

- EBC scenarios (odd-numbered chapters).

Ethics

- EBC scenarios (even-numbered chapters)

Working with numbers: ASET 2005 salary survey

- percentages, ranking, highest / lowest

Language Skill Development Activities & Materials

Listening

- EEME, chapter 1: "Engineering – What's It All About".

Dicto-comp

- COMP

Listening & Speaking

- Listening skills self assessment
  http://www.highgain.com/SELF/index.php
  CCLB Listening & Speaking Outcomes, self evaluation, learning plan. Table of strengths, weaknesses, remedial steps.
- FAE Unit 4: Talking about past events: remembering, describing experiences, imagining what if…
- Online talks on engineering employability skills.

Telephone

- Level 5 competency, see CCLB p.58.

Reading

- Introduction to reading skills: flexible reading strategies. Reading for a purpose. Reading as a goal / problem / solution set-up. Who is the audience, what is the purpose, what goals are being addressed, etc.
- CCLB Reading Outcomes, self evaluation, learning plan. Table of strengths, weaknesses, remedial steps.
- Dictionary use (and using context clues). "Reading is NOT a vocabulary acquisition activity…"
  - RC, Unit 1: Context clues; using a dictionary.

Writing

Introduction / orientation to writing program.

- Instructor PowerPoint on writing for engineers.

CCLB Learning Outcomes for Writing: Benchmarks, 6,7,8.
ES Profiles: Writing tasks of Engineers, Eng. Technologists and Geoscientists.
Self-assessment / learning goals.
Writing a letter

- TSU, Unit 1: Exercises, excellent checklist, pp. 29-34
- TWO, How to Write Letters, Cover Letters and Email, pp.11-20

Non-prose document use

Tables

- ASET 2005 salary survey

Using and creating flowcharts.

- TOWES problem set: flowchart

RAW, Unit 4: Supplying Parts

Worksheets:

- Crane Load Chart

General Technical English

Classification

- T&L, Section 2, "Classification," pp 17-28.

Definition

- TWO, How to Define Terms, pp.92-95, exercises pp.96-103

Worksheets:

- The language of definitions and descriptions.
- Writing definitions.
- Classifying exercise

Review:

- BTE, Chapter 1 topics: Geometric shapes and forms of transport; structures: and vs. but // be or have.

Topic-related resources

- EEME, chapter 1: "Engineering – What's It All About"
- Online talks on engineering employability skills
- *Study Skills for Students of English,* Yorkey, p3.
- ESRP website
- NOC website
- ALIS

2. *Surveying and construction, exploration & discovery*

Technical Topics

World civilizations: the great builders, innovators, inventors, problem solvers, engineering projects.
Migration, exploration & navigation.
Exploration of Western Canada: The Fur Trade, River Systems, Alexander McKenzie
Aboriginal innovations in science and technology.
Civil engineering
Mapping

Sample learning tasks

- Research, write and present a 1-page introduction to a civilization or remarkable innovator from the learner's own part of the world.
- Produce a class survey of likes & dislikes, interests.
- Plot information from presentations on maps.
- Complete the language of definitions and descriptions worksheets.
- Participate in guessing games based on qualifiers.
- Participate in student-expert presentations on civil engineering.

Strategies & foundational skills

Conversation management: indicate partial comprehension
Self-assessing.
Developing a language learning plan: Canadian Language Benchmarks.
Identifying knowledge gaps and training targets.
Conducting online research
Making Notes:

- TCH, Chapter 1.1
- TCH, Chapter 7.139

Paraphrasing

- COMP, Topic 5: Paraphrasing
- EAP, p.60

Functions & Gambits

Describing societies, social systems, inventions.
Describing people, places

- FAE, Unit 13: Describing places, describing people.

Complimenting (on presentations)
Congratulating
Expressing likes / dislikes, wants & desires.
Expressing interest or indifference.

Other competencies

Instructions:

- Simple or routine actions, embedded in sentences. CCLB 6, p.62.
- Use, adapt, generate brief procedures.

Presentations

- TWO, How to Prepare an Oral Presentation, pp.236-241
  - outline and checklist

Grammar

Past tense, regular verbs.
Question formation: past
How far, how fast (how slow), how long did it take?
How does it feel? vs. what does it feel like?
Comparatives:

- Have + more + noun
- Be + more + noun

Superlatives:

- HAVE or BE one / some of the most + adjective

Sequencing & linking
Reported speech: They told us vs. they said to us…

Structures, focus areas

Rhetorical
Chronological

Order of importance

Technical discourse features
Physical, spatial organization
Describing physical properties: sounds, textures, sensations, tastes
Sequencing

Cognitive / taxonomic
Comprehension

- Paraphrase
- Main idea
- Summarize

Type of Processing / Purposive
Describe
Narrate

Type of information requested
Nouns: group, place, thing
Characteristics: type, time, location, attribute

Type of Match
Cycle geographic information from different presentations to label maps.

Constructions

- Dates, years
- Sequencing: first, next, after that, before that
- The most/lease important // more/less importantly

- Compass points, cardinal directions
- Prepositions of location
- Absolute and relative locations
- Distances

- As I understand it,
- In other words
- The main thing… // This is about…
- To sum up

- Sounds like // tastes like, etc.
- Introducing a story

Vocabulary Development

Online dictionaries, building your own vocabulary set.

Vocabulary card collections.

Pronunciation

Vowels: schwa & stress – sentence-level, word level.

Employability, sectoral knowledge, workplace culture

The ability to set goals and priorities.
Soft skills in the EEST sector.

- STEPS, Unit 2: Job Descriptions and Titles

Essential Skills

Distance / speed / time tables (e.g., for explorations)
Working with numbers:

- distances,
- units of distance: conversion charts and tables
- dates, units of time (decades, centuries, millennia, etc.)
- statistics
    - TWO, Statistics: Uses and Potential Abuses, pp.85-87.

Oral expression of numbers

- TSU, pp.64-65, 74-76

Language Skills

Listening

CBC / BBC on exploration, settlement, voyages
Listening & note taking

- TCH Chapter 1, p.11
- TCH, Chapter 7, p.139

Listening & speaking

Oral presentations thread: introduction and overview

- FAE, Chapter 13: Describing places, describing people

Telephone

- Gives / takes phone message with 3 to 5 details. Example: role-play a call to leave a message for senior engineer, following up on the mailing of a resume. (Level 6 competency.)

Reading

Previewing

- READ, Chapter 2: "Previewing"

Writing

Paraphrasing
Sentence combining
Descriptive paragraph:

- on ancient city
- on developmental sequence of a particular civilization or technology

- on a great builder or inventor
- or related topics from the history of science and technology.

Non-prose document use

Using maps
Timelines
Conversion charts

- READ, Chapter 10: Reading Graphics

General Technical English

Sequencing

- T&L, Section 1, Sequencing, pp.1-16

Worksheets

- Writing definitions
- The language of definitions and descriptions.
- Talking about engineering sounds

Review:

- BTE, Unit 18: Structural Safety

Topic-related resources

- LCEE, Unit 1: Historical Overview of Civil Engineering
- LCEE, Unit 2: Surveying
- How GPS receivers work: http://electronics.howstuffworks.com/gps.htm/printable
- Sextants & Satellite Navigation, Surveyor's Transits, GPS systems
- GPS: http://www.colorado.edu/geography/gcraft/notes/gps/gps_ftoc.html
- Research assignment on the road builders: Inca, Romans, Chinese
- LCEE, Unit 3: Modern Buildings and Structural Materials
- Smart buildings (earthquake prevention)
- New Scientist article on Worldmapper
- interesting map distortions www.worldmapper.org
- New Scientist special report on Hurricane Katrina
-

3. Earth Sciences

Technical topics and readings

Geography, Geology
Geophysics

- surveying
- sensing and measuring systems
- resistivity, conductivity, density
- GPS, GIS

Earthquakes, Tsunamis – disaster preparation, prevention (engineering), responses
The western sedimentary basin.
Fossils in Alberta

Sample learning Tasks

- Listen to and discuss CNN activities around Turkish Earthquake Engineering.
- Outline and write own summary of the news report.
- Present, analyze and explain graphs in web reading "Earth's Interior".
- Read and make questions based on How Stuff Works: Smart Buildings (earthquake engineering).
- Participate in student-expert presentations on earth sciences.
- Make damage predictions based on the Richter and Mercalli earthquake measurement scales.

Strategies & foundational skills

Note-taking systems
Outlining

- TCH: Chapter 1.12

Summarizing

Functions & Gambits

Indicating, checking comprehension.
Asking for repetition.
Clarifying, restating.
Getting more information.

Grammar

Tense: Past vs. past perfect
What if… (past – teach as formula for this conditional)
Logical connectors: because, since
So that vs. such that
Causatives

- FOG, Unit

Adverbs
Adverbial phrases: producing, resulting in, causing, making…

Structures, focus areas

Rhetorical
Chronological
Cause and effect

Technical discourse features
Physical descriptions
Process description
Measurement and calculation

Cognitive / taxonomic
Application

- Classify
- Illustrate / show / sketch
- Predict

Type of Processing / Purpose
Explain, present an analysis

Type of information requested
Type, action, manner, conditions
Action qualifiers
Goal, problem, solution

Type of Match
Integrate, generate

Constructions

- Cause / force X **to** Y
- Makes X + verb
- Producing, resulting in, forcing
- Depth, composition
- Size, shape, density, resistivity, conductivity

- Talking about diagrams.
- Diagram components.
- Vocabulary of graphs, labels.
- If // what if

- The reason for that is
- X is caused by // a result of

- In order to
- For the purpose of

Vocabulary Development

Worksheet: ENGINEERING VOCABULARY

Pronunciation

Intonation patterns – questions and statements.
Sentence level stress.
Word level stress.

- Robert Frost's "Stopping by Woods on a Snowy Evening

Employability, sectoral knowledge, workplace culture

- Steps Unit 3: Real Workplace Stories

Essential Skills

Working with diagrams.
Working with numbers
Measurement and calculation.

Language Skills

Listening

- CNN: Science and Technology: Quake Engineering: http://www.literacynet.org/cnnsf/quake/storyweek.html

- **CNN: Science and Technology:** Earthquake Science
- **CBC archives: Canada's earthquakes and Tsunamis** http://archives.cbc.ca/IDD-1-75-1561/science_technology/earthquakes_and_tsunamis/

Listening & speaking

- FAE, Chapter 2: Asking for more information: question techniques, answering techniques.

Reading

Skimming

- RC, p.70 "Skimming"

Main ideas

- READ, chapter 3: Summarizing main ideas.
- RC, Unit 1: Main Ideas

How Stuff Works: Smart Buildings (earthquake prevention): outline, list and sequence main ideas.

Writing

Correction marks.
Sentence combining.
Paraphrasing

- COMP, Topic 5: Paraphrasing
- EAP, pg.60

Writing a descriptive paragraph.

- COMP: Topic 3.

Outline, paraphrase and summarize Turkish earthquake report.
Write informal report on causes and technical responses to Turkish engineering codes.

Non-prose document use

TOWES problem set: Foundry Workers
Diagrams and schematics

- RAW, Unit 6: Creating Glass Art

General Technical English

Cause and effect

- T&L, Section 4, Cause and Effect

General Engineering

- BTE, Unit 3: Materials
- EEME, Unit 3: Engineering Materials
- LCEE, Unit 2: Surveying

Worksheets:

- Mechanical Properties of Materials
- Labelling exercise.
- Oral expressions of mathermatical forumalas exercise.

Topic-related resources

- EEME 5, Statics and Dynamics

- EEME Slide presentations: Society for Exploration Geophysics:
- Slideshow 1: Geology
- Slideshow 2: Geophysics
- LPIE, Unit 3: Exploring for Petroleum
- CNN Weblink: Understanding Earthquakes: http://www.literacynet.org/cnnsf/quakescience/home.html
- CNN Weblink: Earth's Interior. Excellent, detailed graphs and charts. http://www.literacynet.org/cnnsf/quake/home.html

4. The Environment, alternative energy

Technical Topics

Electrical engineering
Mechanical engineering
Climate and natural disasters
Climate change
Alternative energy systems
Photovoltaic, solar thermal, micro-hydro, wind

Sample learning tasks

Debate the seriousness of climate change.
Analyze its causes, effects and consequences.
Offer responses and solutions.

Strategies & foundational skills

Question types, essay structures and transitional words.

- READ, p.117

Memory systems, synthesis chart

- READ, pp.124-127

Functions & Gambits

- Talking about the future: stating intentions, discussing probability, considering what if…
- Conversation techniques: hesitating, preventing interruptions and interrupting politely, bringing in other people.
- Debating: opinions, interruptions, agreeing, disagreeing.
- Expressing conclusions.

Other competencies

Instructions

Presentations

Grammar

Comparatives

- TSU, pp149-154
- TWO, Compare and Contrast Ideas, pp.242-247

Superlatives:
summarizing results – one of the most
Conditionals
Might / must to express probability vs. deduction.

Structures, focus areas

Rhetorical **Constructions**

Describing mechanisms and processes
Condition / action
Predict, express probabilities
Situation / problem / solution
Technical discourse features
Cause and effect
Qualitative descriptions
Cognitive / taxonomic
Analysis
Calculate, compare
Relate, conclude
Criticize, debate
Diagram, outline, test
Type of Processing / Purposive
Explain, justify, persuade
Type of information requested
Condition
Function, purpose
Goal, problem, solution
Assertion / evidence
Type of Match
Integrate / generate

Vocabulary Development

- READ, chapter 5: Vocabulary Development
- READ, chapter 7: Vocabulary Development Through Structure
- RC, Unit 1: Stems & Affixes

Pronunciation

Employability, sectoral knowledge, workplace culture

- STEPS, Unit 4: Workplace Law, Heath & Safety
- EEME 9, Safety at Work
- WHMIS, MSDS, TDS
- RAW, Unit 5: Advocating for Workers (Injury Claims)

Essential Skills

Language Skills

Listening

CBC Ice-Storm
CBC special report: Hydroelectricity
http://archives.cbc.ca/IDD-1-75-1750/science_technology/hydro/
CNN, Science and Technology:

- Fuel Cells for Cars
- http://www.literacynet.org/cnnsf/fuelcell/storyweek.html
- Rooftop Solar Revolution

Listening & speaking

- FAE, Unit 6: Talking about the future: stating intentions, discussing probability, considering what if…
- FAE, Unit 10: Talking about similarities, talking about differences, stating preferences

Telephone Use

Reading

- READ, chapter 8: Reading and Thinking Critically
- TWO, Why the Poor Nations Have So Many Children, pp.143-145
- TWO, Suffer the Children (Western rates of resource consumption), pp140-142

Writing

Process description

- TSU, Unit 2: DNA fingerprinting, pp.56-62
- TWO, How to explain a Process, p.161

Suggestions and proposals

Sample topic: Responses to Climate Change

- TWO, How to Develop a Proposal, pp.253
- WRGR, ch.3.7 – Suggestions and Proposals (core text)
- TSU, Unit 4: Proposals in different disciplines
- TSU, Unit 5: Requests for Proposals, responding to: pp.159-164
- EBC, ch.11 – Proposals

Identifying problems and solutions

- TWO, How to Take a Field Specific Approach, p.25-

Non-text document use

Non-text reading: graphics and mimetics:

- READ, chapter 10: Reading Graphics
- The Language of Documents
- EEME, Unit 26: Graphs

General Technical English

Compare and Contrast

- T&L, Section 3, Compare and Contrast

Topic-related resources

Individual Corporate websites:

- Wind generation, solar thermal, Archimedes screw, etc.

EET, Unit: Resources – Water

EEME 6, Electric Motor

EEME 17, Portable Generator

LCEE, Unit 5: Hydraulic Engineering: Dams & Canals
EET, Unit: Energy: Alternative Sources
CBC ice-storm
Tsunami

- New Scientist special report on Hurricane Katrina
- New Scientist special report on Alternative Fuels