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LECTURE 01: Overview of Clauses

Definition:

A clause is a **group of words with its own subject and verb**. Clauses allow you to **combine ideas** to show their relationship. This adds logic and cohesion to your speech and writing.

There are two types of clauses: **independent clauses** (main clauses) and **dependent clauses** (subordinate clauses and relative clauses).

- **An independent clause** is a complete sentence because it has its own subject and verb and expresses a complete thought.
- **A dependent clause** is part of a sentence, so it cannot stand alone.

Independent clause	Dependent clause
He had no qualification	; however he got the job

- **Although the dependent clause** shown on the previous chart has a subject and a verb, **it does not express a complete thought**. As a result, it cannot stand alone.
- **A dependent clause** often **starts** with a **word** that makes the clause unable to stand alone; for example, *however*. These words are **subordinating conjunctions**.
- **Subordinating conjunctions** link an independent clause to a dependent clause. Each subordinating conjunction expresses a relationship between the dependent clause and the independent clause.

The following chart lists the subordinating conjunctions used most often and the relationships they express.

Subordinating conjunctions	Relationship
Unless, provided that, if	Condition
Because ,as	Reason
Rather than, than, whether	Choice
Though, although, even though, but	Contrast
Where, Wherever	Location
In order that, so	Result
While, once, when, since, as, whenever, after, before, until, as soon	Time

LECTURE02: The Relative Clause

Definition: a relative clause is a dependent clause. It adds extra information or necessary information about one of the nouns in the main clause. It goes immediately after the noun it is related to. The relative pronouns “**who, whose, which, that**” introduce it.

1) The relative pronoun as subject of a relative clause.

E.g. A man is rich. He may spend his money foolishly.

The man **who is rich** may spend his money foolishly.

Note: ‘**That**’ is a possible alternative after **all, everyone, everybody, no one, nobody and those**.

E.g. Nobody **who/ that** knew him liked him.

2) The relative pronoun as object of a relative clause.

E.g. There is the doctor. I met him yesterday.

There is the doctor **whom/ who/ that I met yesterday**.

Or: There is the doctor I met yesterday. (Relative pronoun omitted when used as object).

3) Whose: is the possessive determiner form of “**who**”. It usually refers to a person or people. It replaces **his, her, and their** or a possessive case (s).

E.g. The film is about a spy **whose wife betrays him**.

(Relative clause- possessive)

.Relative pronouns used in relative clauses:

	Subject	Object	Possessive
For person	Who That	Whom/ That/ Who	Whose
For things	Which That	Which That	Whose/ of which

LECTURE03: Active and Passive Voice

Active and passive sentences usually have the same meaning but the focus is different. In the active voice the subject performs the action expressed and the focus is on the agent that does the action.

For example:

Adam	cleaned	the kitchen
subject	action	object

In the passive voice the subject receives the action expressed in the verb. The object of the active sentence becomes the subject of the passive sentence. We use a passive verb to say what happens to the subject. The focus of the sentence is on the subject that receives the action.

The passive verb is formed by the verb **to be** (**is, are, was, were, have/has been, was/were being, will be.....**) +**the past participle** of the verb .

E.g.

The kitchen was cleaned by Adam

subject	action	object
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The person who makes the action is introduced by the preposition **by** in the passive sentence. But in some cases the subject of the passive sentence is omitted, this happens when **who or what** causes the action is unknown or unimportant. Look at the examples

Active	Passive
Mary bought a book	A book was bought by Mary
A thief stole my car	My car was stolen (by a thief)
I read the message	The message is read (by me)
Someone has opened the window	The window has been opened
They are building a house	A house is being built
They are building three houses	Three houses are being built

Formation of the Passive Form

Active	Passive
Present simple She does the homework	Am/is/are The homework is done (by her)
Past simple He did the homework	Was/were+past participle The homework was done (by him)
Present continuous She is doing the homework	Am/is/are +being+ past participle The homework is being done (by her)
Past continuous He was doing the homework	Was/were+being+past participle The homework was being done (by him)
Present perfect She has done the homework	Have/has+been+past participle The homework has been done (by her)
Past perfect He had done the homework	Had+been+past participle The homework had been done (by him)
Future(will) She will do the homework	Will+be+past participle The homework will be done (by her)
Future(going to) He is going to do the homework	Am/is/are going to+be+past participle The homework is going to be done (by him)
Infinitive She wants to do the homework	To be+past participle She wants the homework to be done
Modal Ha can do the homework	Modal+be+past participle The homework can be done (by him)
Gerund They are building the house	Being+past participle The house is being built

LECTURE04: Affixes

Prefixes and suffixes are grammatical “affixes” (prefixes come before the root word and suffixes come after)

In very simplistic terms, prefixes change the meaning of words, and suffixes change their form (including plural, tense, comparative, and parts of speech).

Some of the most common prefixes are:

Un, re, dis, inter....like for example **un**happy, **re**turn, **dis**agree, **inter**national.

Some of the most common suffixes are:

Able, ship, ly, hood, tion....like for example **com**fortable, **champion**ship, **kindly**, **child**hood, **starvation**.

Exercise: Use the words between brackets in the appropriate form (use prefixes or suffixes)

1. He was acting in a very (child)...**childish**...way
2. The team that he supported was able to win the (champion) **championship**
3. I think you should (consider) ...**reconsider** ..your decision again.
4. She looked (happy)...**unhappy**....she started to cry.

Electricity:

Part one: Definitions

- 1) **A jack:** a jack is an electric socket fixed on the wall
- 2) **A fuse:** a fuse is a current breaker that melts if the current exceeds a particular level
- 3) **A thermocouple:** a thermocouple is a device for measuring temperature
- 4) **A galvanometer:** a galvanometer is a device used to detect the direction of small electric current and measure its strength
- 5) **The electric utility power station:** it is the place where electricity is generated

Part Two: Fill in the gaps with the following words (produce, steam turbines, blades, forced, generator, kinetic energy, electricity, mechanical)

Most of the **electricity** in the United States is produced in **steam turbines**. A turbine converts the **kinetic energy** of a moving fluid (liquid or gas) to **mechanical** energy. Steam turbines have a series of **blades** mounted on a shaft against which steam is **forced** and the shaft is connected to a **generator**. The fuel is burned in a furnace to heat water in a boiler in order to **produce** steam.

Part Three: Answer the following questions

1. What is a passive component? Give one example

A passive component cannot introduce net energy into the circuit. It also cannot rely on a source of power e.g capacitors.

2. What is an active component? Give one example

An active component relies on a source of energy and usually can inject power into a circuit. Active components include amplifying components e.g transistors.

3. What is an electric current?

It is the flow of microscopic particles called electrons flowing through wires and components.

Waves and Vibrations:

What is a vibration:

A wiggle in time is a vibration, a wiggle can be described as a back and forth movement. Therefore, a wiggle in time or what we call vibration is the time it takes an object to go to another location and back to its original location.

What is a wave:

A wiggle in space and time is a wave. A wave cannot exist in just one place. It has to move from one place to another. For example, light and sound move through space as waves.

What is a harmonic motion:

Any motion that repeats itself at regular intervals is called harmonic motion or periodic motion.

A mechanical wave:

A mechanical wave is a wave that can only exist within a material medium such as air, water, or rock.

A transverse wave:

With transverse waves, the vibrations are perpendicular to the direction of motion. In other words, while the particles move up and down, the wave travels to the right or to the left.

Longitudinal waves:

With longitudinal waves, the vibrations are parallel to the direction in which the wave travels. For instance, while the particles vibrate from left to right, the wave travels to the right.

2. Fill in the gaps with the following words (harmonic motion, back, forth, restoring force, proportional)

A simple harmonic motion (SHM) is a special case of **harmonic motion**. A SHM is a **back** and **forth** motion and it always requires a **restoring force** and the restoring force is **proportional** to the displacement from equilibrium.

Hooke's Law:

The bigger the restoring force the bigger the displacement. For instance, in simple harmonic motion the restoring force is proportional to the displacement from equilibrium.