



# EQUILIBRIUM STRUCTURES



Student:

Year:

Date:

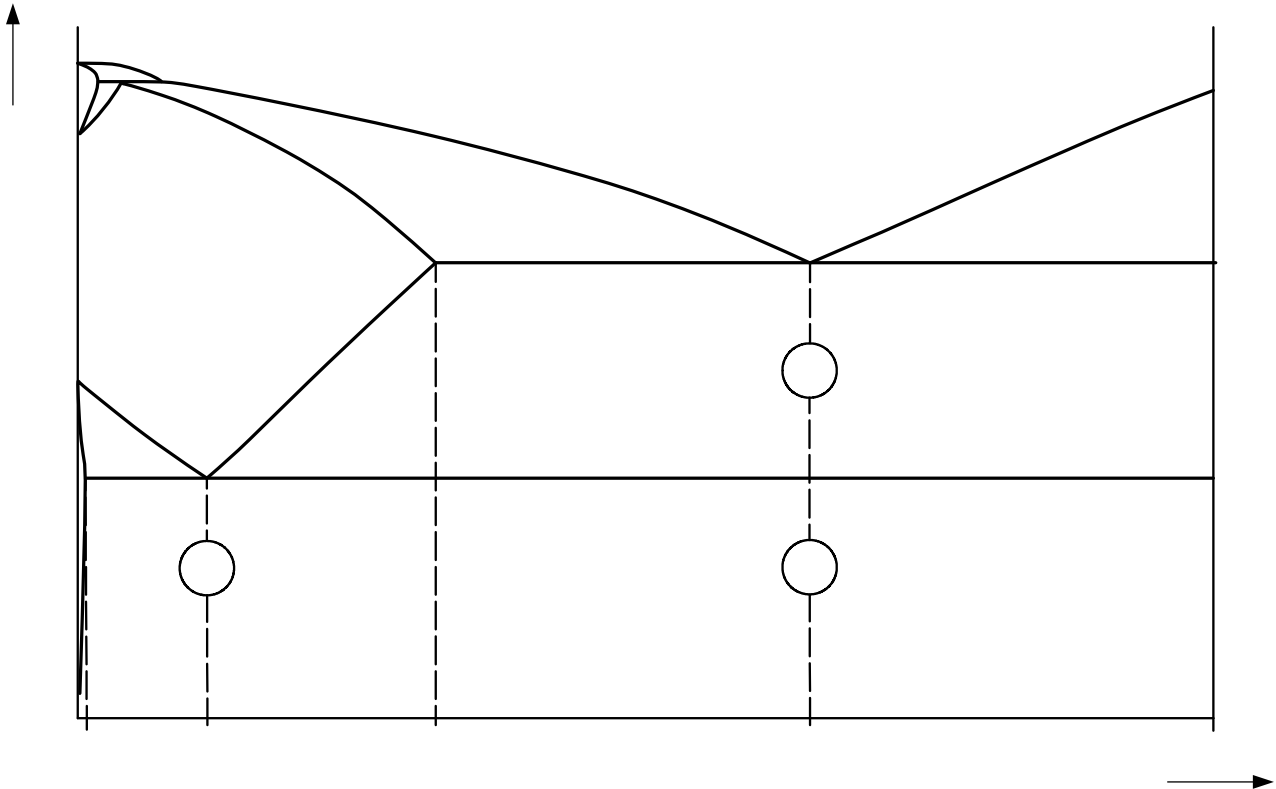
Teacher:

## Program:

- Imaging of structure of steel using light microscopy
- Metastable Iron-Iron Carbide (Fe-Fe<sub>3</sub>C) Phase Diagram
- Metastable structures of steel
  - Microscopy imaging
  - Preparation of metallographic samples

## Phase Diagram

**Task 1:** Fill the diagram Fe-Fe<sub>3</sub>C (temperatures, chemical composition, microstructures)



**Graph 1:** *Metastable Iron-Iron Carbide Phase Diagram*

**Task 2:** Characterize equilibrium structures of steel (definition, hardness, strength).

Ferrite:

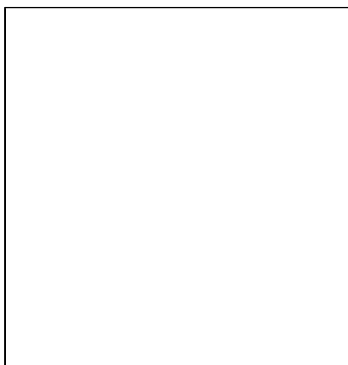
Pearlite:

Austenite:

Cementite:

Ledeburite:

**Task 3:** Examine the given metallographic samples with the help of a light microscope. Draw their structures schematically and identify structural components.

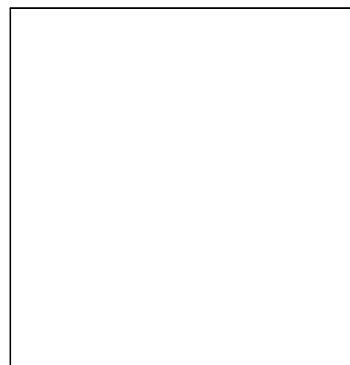


*Sample #:*

*Magnification:*

*Etching Agent:*

*Structure:*



*Sample #:*

*Magnification:*

*Etching Agent:*

*Structure:*

**Task 4:** Estimate volume fraction of pearlite of the given microstructure using point count and linear method.

**Task 5:** Estimate a carbon content of the given material (Task 4) and designate it into the Fe-Fe<sub>3</sub>C.

**Conclusion:**