



Preparatory Class B.C.P.S.T (Biology, Chemistry, Physics, Geology and
Maths) in *Lycée Jacques Prévert*

2010-2012

PHYSICS

PART A: ELECTRICITY	
1	General laws of the electrokinetics
2	Linear dipole
3	Linear circuits
4	Transitory regime of linear circuits
5	Linear circuits in forced sinusoidal regime
6	Power in sinusoidal regim
7	Linear or not linear circuits
8	Operational Amplifier in linear regim
9	Passive or active filters
PART B: OPTICS	
1	Presentation of the geometrical optics
2	Laws of geometrical optics
3	Formation of image by a system optics
4	Assemblies Editings of optics
5	Introduction to the undulatory optics
6	Interferences not localized in monochromatic light
7	Diffraction in the infinity by a network plan
PART C: THERMODYNAMIC	
1	Introduction to thermodynamic
2	The model of the perfect gas
3	Real gases and condensed states
4	Evolution of a closed system
5	First principle and application
6	Second principle and application
7	Change of state of the pure body
8	Thermal machine (Carnot motor etc...)
9	Balance of a body under several phases
10	Study thermodynamics of the functions of states
11	Thermodynamics functions
12	Balance Assessments on the open systems
13	Majorities on the phenomena of transport
14	Electrical conduction of the metals
15	Thermal conduction

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PART D: MECHANICS

- 1 Intéractions - solid balances
- 2 Statics of the fluids
- 3 Kinematics
- 4 Dynamics of the material point in Galilean reference table
- 5 Energy of a material point - vibration to the neighborhood of the balance
- 6 Mechanics of the point to the neighborhood of the balance
- 7 Introduction in the fluid mechanics
- 8 Fluid Dynamics
- 9 Viscosity-study of the real fluids

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CHEMISTRY

PART A: ATOMS AND CHEMICAL BUILDINGS

- 1 Atom and energy quantification
- 2 Electronic configuration of atom
- 3 The quantum model of the atom
- 4 Periodic Period
- 5 Electronic structure of molecule and ions
- 6 Quantum approach of the connections
- 7 Intermolecular Forces

PART B: CHEMICAL KINETICS

- 1 Physico-Chemical system
- 2 Kinetic reaction in closed system
- 3 Reactional mechanisms
- 4 Catalysis

PART C: AQUEOUS SOLUTION

- 1 Introduction to Aqueous solution
- 2 The acido-basic couples
- 3 Method of the main reaction
- 4 Acido-basic titration
- 5 Complexation balance- Conductimetry Titration
- 6 Precipitation balance
- 7 Oxydoreduction
- 8 E-Ph Flow

PART D: THERMOCHEMISTRY

- 1 First Principle: size of system or reaction
- 2 Tabulation of reactions
- 3 Chemical system evolution
- 4 Chemical potential
- 6 Evolution and Balance of a system
- 7 Moving Balance Laws
- 8 Binary diagram liquid/ vapor and liquid/solid

PART E: ORGANIC CHEMISTRY

- 1 Formula of consisted organic
- 2 Stereoisomery
- 3 Introduction in the reactivity and organic synthesis
- 4 Spectroscopy
- 5 Alkenes
- 6 Halogeno-alkanes
- 7 Alcohols
- 8 Aldehydes and ketones
- 9 Amines
- 10 Aromatic hydrocarbons
- 11 Mixed Organomagnesium
- 12 Carboxylic acids and derived functions

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MATHS

PART A: COMPLEX NUMBER AND POLYNOMIAL NUMBER	
1	Complex Number
2	Polynomial with real or complex coefficient
PART B : LINEAR ALGEBRA	
1	Linear equation systems
2	Matrix with coefficient in K
3	Vector space and sub-vector space
4	Linear application
5	Linear Equation Systems
6	Matrix
7	Proper value, proper vector
PART C: GEOMETRY	
PART D: MATHEMATICAL SERIES AND REAL FUNCTIONS OF A REAL VARIABLE	
1	Real suite
2	Limit and Continuity
3	Differentiation, limited developement (Taylor)
PART D: INTEGRAL CALCULUS	
1	Definition and properties
2	Integration Method
3	General Integration
4	Differential equation with real variable
PART E: SERIES	
PART F: REAL FUNCTIONS WITH SEVERAL REAL VARIABLES	
1	Differential Calculus
2	Integral Calculus
PART G: PROBABILITY	
1	Elementary Algebra
2	Notion of Probability
3	Probability
4	Discrete random variables
5	Density of probability
6	Theorem of the limit

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GEOLOGY

PART A: THE EARTH, AN ACTIVE PLANET	
1	Intern structure of the Earth
2	Form and dynamics (gravity, anomalies, isostasy, etc)
3	Tomography
4	Terrestrial Geotherm
5	Convection model
PART B: MAGMATISM	
PART C: SEDIMENT PHENOMENON	
1	Mechanical Weathering
2	Chemical Alteration
3	Sedimentation
PART D: STRUCTURAL AND MINERALOGICAL TRANSFORMATION OF THE LITOSPHERE	
1	Rheology of the lithosphere
2	Mineral transformation
3	Tectonic Object and metamorphism, example of the Alps
PART E: CARBON CYCLE	

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BIOLOGY

	PART A: The cellular and molecular organization of the alive
1	The eucaryote cell
2	Molecules of the alive
3	Membrane and cellular functioning
	PART B: Cellular metabolism
1	Enzymes
2	General structures of the metabolism and the role of coenzymes
3	Eucaryote photosynthesis
4	Oxidative catabolism
	PART C: The genetic information in the cellular scale
1	Support and organisation of the genetic information
2	Molecular mechanisms of preservation of the genetic information
3	Molecular mechanisms of the genetic expression
4	Genetic transmission
	PART D: Biology of the organisms
1	Diversity of the alive
2	The organism in connection with its environment
3	Construction of an organism by a plan of organization
4	Implementation of the plan of organization to vertebrates
5	The post-embryonic development of Angiosperms
6	Acquisition of the plan of organization of the frog
	PART E: Reproduction of the animal and plant organisms
1	Sexual reproduction of plants
2	Natural vegetative multiplication of the Angiosperms
	Sexual reproduction of the mammals
3	Chromosome aspects and genetics of the reproduction
	PART F: Diversity of the trophic types
	PART G: Intercellular communications of the animal
1	Messengers and messages in the nervous and hormonal correlations
2	Mode of cellular action of neurotransmitters and hormones
3	Genesis and distribution of the nervous message on the scale of the neuron
	PART H: The functioning of the scrawny muscle cell
1	Functional organization of the scrawny muscle cell
2	Coupling excitation / contraction
3	Cellular activities and energy metabolisms of the genetic muscle cell
	PART I: Integration of the blood circulation in the functioning of organs
1	The transport of respiratory gases by the blood
2	The cardiac pump and the entry into blood circulation
3	Distribution of the blood in the muscle and its control
4	Integration of the drip of the muscle on the scale of the organism

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MONTEFIORE LISE

Achieved a course in the field:

**B.C.P.S.T.: Biology, Chemistry, Physics, Geology,
and Mathematics**

2009-2010: Grade GOOD

Je, soussignée, Fabienne CASTERAS, professeur de
sciences de la Vie et de la Terre de BCPST2
du lycée Jacques Prévert, certifie que Lise
Montefiore a bien suivi la formation et
obtenue la mention indiquée.

Montefiore

TRANSLATION FRENCH TO ENGLISH OF THE GRADE:

MONTEFIORE LISE

Achieved a course in the field:

**B.C.P.S.T.: Biology, Chemistry, Physics,
Geology, and Mathematics**

2010-2011: Grade Acceptable

Je, soussignée, Fabienne CASTERAS, professeur
de Sciences de la Vie et de la Terre de BCPST2
du lycée Jacques Prévert, certifie que Lise
Montefiore a bien suivi la formation et
obtenu la mention indiquée.

Montefiore

TRANSLATION FRENCH TO ENGLISH OF THE GRADE:

MONTEFIORE LISE

Achieved a course in the field:

**B.C.P.S.T.: Biology, Chemistry, Physics,
Geology, and Mathematics**

2011-2012: Grade Good

Je, soussignée, Fabienne CASTERAL, professeur
de Sciences de la Vie et de la Terre de BCPST2
du lycée Jacques Prévert, certifie que Lise
Montefiore a bien suivi la formation et
obtenu la mention indiquée

Fabienne