



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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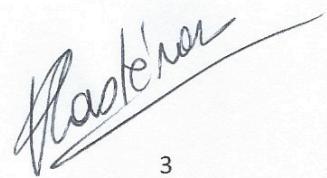
PART D: MECHANICS

- 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

H. Latrénas

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



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 Techtonic Object and metamorphism, example of the Alps

PART E: CARBON CYCLE

Plastenau

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
3	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 exitation / 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

Phasikas

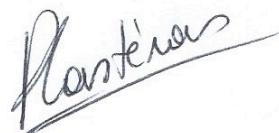
MONTEFIORE LISE

Achieved a course in the field:

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

2009-2010: Grade GOOD

Je, désignée, fabienne CASTERA^{IS}, 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.

Castéra

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, ~~aujourd'hui~~, fabienne CASTERA^s, professeur
de Sciences de la Vie et de la Terre de BCPST2
du lycée Jacques Prevet, certifie que Lise
Montefiore a bien suivi la formation et
obtenu la mention indiquée.

F. Castéra

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, sous-signée, Fabienne CASTERA, professeur
de Sciences de la Vie et de la Terre de BCPST2
du lycée Jacques Prévert, certifie que Lise
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