Chapter 1

PRESENTATION OF "TUDOR VIANU" NATIONAL HIGH SCHOOL OF COMPUTER SCIENCES

"TUDOR VIANU" National High school of Computer Science annually trains more than 250 graduates, who leave school every year and continue their studies in higher education institutions such as the Polytechnics (Automatics, Electronics, Economic Engineering), the University (Mathematics, Mathematics – Information Technology), the Academy of Economics (Cybernetics). Two per cent of the school graduates study architecture, Romanian literature, foreign languages, law, and making good use of their computer skills in their future professions.

Every year a number of students are admitted to American universities, succeeding in fully integrating themselves into the life of the American campus.

We see the new millennium still dominated by IT and we hope that the new technologies will help society solve its problems and achieve progress in all fields. The impact of IT is growing every day and the future development of society cannot be conceived of outside an interdisciplinary approach.

The challenges of the 21st century: continuous training, "life-time learning", the introduction of IT in all fields, human communication, tolerance and free access to knowledge, cultural and scientific values of mankind teachers' special qualities, their readiness to take part in the professional and social education of youth.

The permanent redefinition of educational quality, the efficiency of the educational process, European integration, the quality of the lesson turned into added plus value represent features of an open, dynamic and democratic society which we want to become.

The efforts of the managing team are steadily directed towards the fulfilling of our ***VISION***, namely training our graduates as people with flexible thinking, with all round knowledge in addition to their speciality, like to develop their creative potentiality in any field.

Our ***MISSION*** combines the material and human resources of our whole team for the meeting of the following objectives:

I. the use of education in lesson as well in all educational activities;

II. the encouragement of COMPETITION, HIGH ACHIVEMENT, SCHOOL PROGRESS, the improvement of the curriculum and the setting up of optional courses likely to learn to individual training and stimulation of values.

Our MISSION is carried out through:

- human resources: teachers, the managing team, pupils, who show their dynamic attitude in the educational process;
- the material stimulation of students' and teachers' high achievements through prizes and trips abroad financed by sponsors.

Today, the present management focuses on ensuring the proper conditions for the establishment of new technologies in the educational system. Thus, the project for the development of our college is based upon the chosen strategy required by our goal, which is to train our graduates for the IT working field. Developments of the creative side in the IT field are accomplished through daily collaboration between students and their teachers and through the involvement of our college indifferent stages of important projects such as: building the web site which aims to promote Romanian tourism (at the special request of the Ministry of Transport, Constructions and Buildings), creating the CD with the theme: "Romanian Youth in the Information Society"(in collaboration with the ministry of Communication and Information Technology), developing and testing the educational software through the partnership with Siveco Romania (AEL lessons for learning Physics, IT, Math, Chemistry).

The teachers of the curricular area MATHEMATICS AND SCIENCE have contributed to the development of the SEI VIRTUAL PLATFORM as authors of 50 computer aided interactive lesson of physics, chemistry and information technologies. This activity has enriched the didactic scientific stock of the school and the research carried on by the team of teachers Rodica Cherciu, Florina Stan, Corina Dobrescu, Silvia Moraru has lead to the didactic plans, which combine the accuracy of a student-centred lesson project with the use of IT means. The educational software is part of SEI-AEL PLATFORM, which can be used at any time in any physics, chemistry, IT or AEL lab in Romania.

MATERIAL RESOURCES

Benefiting from the International Bank Program, the old part of the school, side A, has been consolidated and rehabilitated.

At present, the 1131 students have at their disposal:

- 19 classrooms;
- 7 IT laboratories provided with Pentium computers and a network served by 3 Linux and one NT, connected to the Internet;
- a Multimedia lab;
- a Multimedia lab (MAN AND SOCIETY curriculum area);
- a Multimedia lab (LANGUAGE AND COMUNICATION curriculum area);
- 2 physics labs;
- a chemistry lab;
- a biology lab;
- a mathematic lab;
- a gym- hall;
- a library with 25,000 books;
- a football pitch;
- a basketball ground.

The Ministry of Education and Research, sector 1 City hall have participated in 2004-2010 in modernizing the material base. Thus, there were inaugurated:

- THE MULTIMEDIA DOCUMENTATION CENTRE-both for teachers and students;
- a new MULTIMEDIA LAB.
- the modernisation of the IT labs by acquiring latest generation computers;
- the development of material resources by acquiring new physics, chemistry, mathematics and biology laboratories;

“ICT and EDUCATION” is a permanent preoccupation of the managing team and the seven recently acquired blackboards likely to be used at all didactic activities are a result of this.

HUMAN RESOURCES - pupils

“TUDOR VIANU” National High school of Computer Science provides education to pupils aged 14 to 18, with a specialization in mathematics-IT. The students admitted by means of computerized distribution in 2009 had grades between 10.00 and 9.39, which point to their high level of school training.

In the academic year 2009/2010, we have provided education to :

- 110 5^{th} to 8^{th} graders;
- 225 9^{th} graders-mathematics –IT out of which:

225-intensive IT

- 246 10th graders-mathematics-IT- out of which:
  246- intensive IT
- 230 11th graders-mathematics-IT-out of which:
  a) 87- mathematics-IT
  b) 143- intensive IT
- 210 12th graders-mathematics-IT-out of which:
  210- intensive IT

Since the school year 2000-2001 we have been training lower-secondary school pupils , aged between 11and 14, observing the national curriculum for the 5th to 8th grades.

The basic training is achieved according to the standards imposed by the approved school curricula, obtaining excellent results in the mathematics, IT and astronomy school contests and Olympiads.

ACHIEVEMENTS AND RESULTS

BACALAUREAT (SCHOOL LEAVING CERTIFICATE)

➢ **1990** – 250 pupils – **100%** 84 average grades above 9	➢ **2000** – 278 pupils – **99.99%** 104 average grades above 9
➢ **1991** – 250 pupils – 100% 123 average grades above 9	➢ **2001** – 243 pupils – **100%** 178 average grades above 9
➢ **1992** – 298 pupils – **100%** 70 average grades above 9	➢ **2002** – 300 pupils - **100%** 220 average grades above 9
➢ **1993** – 300 pupils – **100%** 150 average grades above 9	➢ **2003** – 350 pupils - **100%** 270 average grades above 9
➢ **1994** – 308 pupils – **100%** 75 average grades above 9	➢ **2004** – 275 pupils - **100%** 146 average grades above 9
➢ **1995** – 331 pupils – **100%** 80 average grades above 9	➢ **2005** – 208 pupils – **100%** 182 average grades above 9
➢ **1996** – 300 pupils – **100%** 100 average grades above 9	➢ **2006** – 228 pupils – **100%** 165 average grades above 9
➢ **1997** – 331 pupils – **100%** 98 average grades above 9	➢ **2007** – 300 pupils – **100%** 214 average grades above 9
➢ **1998** – 279 pupils – **100%** 80 average grades above 9	➢ **2008** – 237 pupils – **100%** 179 average grades above 9
➢ **1999** – 319 pupils – **99%** 95 average grades above 9	➢ **2009** – 281 pupils – **99.30%** 195 average grades above 9

School Contests (Olympics)

At the **2001** National Olympics, 7 of our pupils ranked first, 8 ranked second, 7 third and 5 were granted Mentions of Merit.

At International Olympics, the results were:

Silver Medal – Second Prize – **Daniel Nedelcu** – Chemistry, India 2001
Gold Medal – the Balkan Olympics in Mathematics, Cyprus – **Andrei Negut**, **Gabriel Kreindler**
Third Prize – Central and South-East Europe Contest
Victor Costan – IT
Second Prize – International Contest of IT, Russia – **Radu Berinde**
Mention – International Olympics of Physics – **Tiberiu Tesileanu**
Mention – ranked 6th in the world – Junior Achievement 2001, Singapore – **Marius Barbu** and **Mircea Costache**

Our pupils won 41 prizes,out of which 18 Prizes I and II, at **2001 – 2002** the National School contents.

This school year was the Golden Year for “Tudor Vianu” National High School of Information Technology as for as students’ participation in International school Contents: 10 prizes of which 5 gold medals, 4 silver medals and 1 bronze medal.

Kreindler Gabriel – **Gold Medal** – Math Balkan Contest ~ Tg. Mures ~ România.
Negut Andrei – **Gold Medal** – Math Balkan Contest ~ Turcia (Antalia).
Costan Victor – **Gold Medal** – Central Europe Contest – Slovakia
Costan Victor – **Silver Medal** – The IT International Olympiad – South Korea
Berinde Radu – **Gold Medal** – The IT International Olympiad - South Korea
Berinde Radu – **Gold Medal** – The IT Balkaniad – Belgrade
Nedelcu Daniel – **Bronze Medal** – Chemistry International Olympiad – Holland
Tesileanu Tiberiu - Silver Medal – Physics International Olympiad – Indonesia
Tataroiu Razvan - Silver Medal – Physics

In the National Olympiad from **2002-2003**, 65 students have participated obtaining 44 prizes and mentions out of which 22 1st and 2nd prizes.

In the International Contests and Olympiads there have participated 10 students obtaining 14 international prizes out of which 10 gold medals, silver medals and 4 bronze medals.

Kreindler Gabriel – **Gold Medal** – Tokyo – 2003 – Mathematics International Olympiad
Stefanescu Andrei – **Silver Medal** – Tirana – 2003 – Mathematics Balkaniad
Stefanescu Andrei – **Silver Medal** – Tokyo – 2003 - Mathematics International Olympiad
Negut Andrei - Silver Medal – Tirana – 2003 – Mathematics Balkaniad
Negut Andrei - Silver Medal – Tokyo – 2003 - Mathematics International Olympiad
Moldovan Mihai – **I Prize** – Russia – Physics International Olympiad
Carp Alexandru – **Bronze Medal** – Russia – Physics International Olympiad
Costan Victor – **Silver Medal** – Munich – CEOI
Costan Victor – **Gold Medal** – USA – The IT International Olympiad
Berinde Radu - Silver Medal – Munich – CEOI
Berinde Radu - Gold Medal – USA – The IT International Olympiad
Ghinea Dan – **Silver Medal** – USA – The IT International Olympiad
Ghinea Dan – **Gold Medal** – Romania – The IT Balkaniad
Gruber Matei – **Bronze Medal** – Romania – The IT Balkaniad

In the school year **2003-2004**, 77 students participated in the national Olympiads, gathering 57 prizes and runner-up prizes, as follows:

- biology – 3 special prizes (Marinescu Mirela, Stoica Doriana);
- chemistry – 6 prizes and runner-up prizes (Moraru Silvia, Bogdan Daniela);
- physics – 10 prizes and runner-up prizes (Stan Florina, Stoica Ioana, Dobrescu Corina);
- geography – 3 runner-up prizes (Bogdan Rusu, Mocanu Alexe);
- IT– 18 prizes and runner-up prizes (Cherciu Rodica, Militaru Daniela, Homorodeanu Marcel, Achinca Corina, Balanescu Cecilia, Dan Grigoriu);
- history – 1 prize (Ionescu Dan);
- French – 1 runner-up prize (Raicu Mariana);
- mathematics – 13 prizes and runner-up prizes (Paun Cristinel, Dumitrescu Alexanra, Moldoveanu Sever);
- Romanian – 1 runner-up prize (Donovetky Ohara);
- astronomy - 1 runner-up prize (Dobrescu Corina);

In the international competitions and Olympiads, 12 gold, silver and bronze medals have been won. The members of the “Performance Team” who have attained these results are:

Negut Andrei – **Gold medal** – Athens 2004 – International Olympiad in Mathematics
Kreindler Gabriel – **Silver medal** – Athens 2004 – International Olympiad in Mathematics
Stefanescu Andrei – **Silver medal** – Athens 2004 – International Olympiad in Mathematics
Sever Moldoveanu – coordinating teacher
Negut Andrei – **Gold medal** – Bulgaria 2004 – Mathematics Balkaniad
Kreindler Gabriel – **Gold medal** – Bulgaria 2004 – Mathematics Balkaniad
Sever Moldoveanu – coordinating teacher
Vladu Adrian – **Bronze medal** –Iasi – Romania 2004 – IT Balkaniad
Vladu Adrian – **Silver medal** –Athens 2004 – International Olympiad in IT
Digulescu Mircea – **Bronze medal** – The Central and Eastern Europe Contest – IT – 2004

The multidisciplinary Olympiad:
Tcaciuc Patricia – **Bronze medal** – International Chemistry Contest – Yacutzia –Russia -2004
Silvia Moraru – coordinating teacher
Stoica Bogdan – **Bronze medal** – International Physics Contest – Yacutzia – Russia -2004
Stoica Ioana – coordinating teacher
Stanescu Traian – **Bronze medal** – International Physics Contest – Yacutzia – Russia -2004
Stan Florina – coordinating teacher
Carp Alexandru – **Silver medal** – Korea 2004 – International Olympiad in Physics
Stoica Ioana – coordinating teacher

In the school year **2004-2005**, we had a record number of participants in National Olympiads out of wich obtained 60 prizes and mentions, as follows:

- **Biology** – 1 prize;
- **Chemistry** – 9 prizes and mentions;
- **Physics** – 11 prizes and mentions;
- **Geography** – 4 prizes and mentions;
- **IT** – 17 prizes and mentions;
- **History** – 2 prizes;
- **Mathematics** – 10 prizes and mentions;
- **Romanian language** – 1 prize;
- **Astronomy** – 2 prizes;

- **Roman languages** – 4 prizes and mentions.

In the National and International contests, we have obtained 13 gold, silver and bronze medals. The members of the performance team are:

Gabriel Kreindler – gold medal -International Olympics in Math;
Gabriel Kreindler – silver medal- Balkan Olympics in Math;
coordinating teacher – Severius Moldoveanu.
Andrei Stefanescu – gold medal – Balkan Olympics in Math;
Andrei Stefanescu – silver medal – International Olympics in Math;
coordinating teacher – Severius Moldoveanu.
Alexandra Patricia Tcaciuc – gold medal- Balkan Olympiad in Chemistry;
Alexandra Patricia Tcaciuc – silver medal – D.I. Mendeleev Olympiad;
Alexandra Patricia Tcaciuc – bronze medal
International Olympiad in Chemistry.
coordinating teacher – Silvia Moraru.
Andrei Petrut Dinu-Ionita – silver medal - International Olympics in Biology;
coordinating teacher – Ioana Stoica.
Mihai Moldovan – gold medal- International Olympics in Physics;
coordinating teacher – Florina Stan.
Bogdan Stoica – silver medal - International Olympics in Physics;
coordinating teacher – Ioana Stoica.
Laura Monica Mocanu – bronze medal
International Multidisciplinary Olympiad ‘Yacutzia’ – Physics;
coordinating teacher – Ioana Stoica.
Octavian Ganea – silver medal
International Multidisciplinary Olympiad‘Yacutzia’ – Mathematics;
coordinating teacher – Alexandra Dumitrescu.
Mihai Moldovan, Gabriel Kreindler, Andrei Costescu – gold medal
The contest ‘Data Modeling Competition’ organized by ORACLE;
coordinating teacher – Alexandra Dumitrescu.

During **2005-2006** school year, 113 students participanted in National Olympiads, of whem 59 got prizes and mentions, in the following subjects:

- **Biology** – 2 prizes;
- **Chemistry** – 4 prizes and mentions;
- **Physics** – 9 prizes and mentions;
- **Geography** – 3 prizes and mentions;
- **IT** – 18 prizes and mentions;
- **History** – 1 prize;
- **Mathematics** – 14 prizes and mentions;

- **Romanian language** – 2 prizes;
- **Astronomy** – 1 prize;
- **Foreing languages** – 5 prizes and mentions.

At international competitions and olimpiads our students got 11 gold, silver and bronze medals. The member of the **High Achivement Center** who reaped this rewards are:

Grosu Codruț – gold medal
International Olympics in Informatique (MEXICO):
Vladu Adrian – bronze medal
International Olympics in Informatique (MEXICO):
Vladu Adrian – silver medal
Center and Eastem Europe Olympics in Informatique (SLOVENIA)
Diaconu Adrian – bronze medal
Center and Eastem Europe Olympics in Informatique (SLOVENIA)
Grosu Codruț – bronze medal
Information Technology Balkaniad (CYPRUS)
Turea Liviu – bronze medal
Mathematics Balkaniad (CYPRUS)
Ioanovici Cristina – silver medal
International Olympics in Geography (AUSTRALIA)
Andrei Petrut Dinu-Ionita – silver medal
International Olympics in Biology (ARGENTINA)
Bogdan Stoica – silver medal
International Olympics in Physics (SINGAPORE)
Rodina Laurențiu – bronze medal
International Olympics in Physics - ‘Zautycov’(KAZAKHSTAN)
Turea Liviu – silver medal.
International Multidisciplinary Olympiad ‘Yacutzia’ Mathematics (RUSSIA):

During **2006-2007** school year, 100 students participanted in National Olympiads, of whem 54 got prizes and mentions, in the following subjects:

- **Biology** – 1 prize;
- **Chemistry** – 9 prizes and mentions;
- **Physics** – 10 prizes and mentions;
- **Geography** – 1 prize;
- **IT** – 14 prizes and mentions;
- **Mathematics** – 16 prizes and mentions;
- **Foreing languages** – 5 prizes and mentions.

At international competitions and olimpiads our students got 11 gold, silver and bronze medals. The member of the **High Achivement Center** who

reaped this rewards are:

Popescu-Stroe Robert – physics

International Olympics in Physics – Iran– bronze medal

International Olympics in Mathematic and Physics – Kazakhstan– bronze medal

Armăşescu Vlad – physics

International Olympics in Mathematic and Physics – Kazakhstan– gold medal

Țurea Lucian –mathematic

International Olympics in Mathematic and Physics – Kazakhstan– gold medal

International Olympics in Mathematic – Vietnam– silver medal

Mathematics Balkaniad – Bulgaria – gold medal

Muraru Sînziana – chemistry

Olimpiada Pluridisciplinară Yakutzia, Rep. Sakha – gold medal

Bumbăcea Radu – mathematic

Mathematics Balkaniad juniori – Bulgaria – gold medal

Munteanu Alexandru – mathematic

Mathematics Balkaniad juniori – Bulgaria – silver medal

Răileanu Roberta – mathematic

The International Contest – Arhimede, Bucureşti – silver medal

Nae Alexandra – mathematic

The International Contest – Arhimede, Bucureşti – silver medal

2007-2008

During **2007 – 2008** school year, 94 students participanted in National Olympiads, of whem 53 got prizes and mentions, in the following subjects:

- **Chemistry** – 11 prizes and mentions;
- **Physics** – 11 prizes and mentions;
- **IT** – 12 prizes and mentions;
- **Mathematics** – 17 prizes and mentions;
- **Romanian language** – 1 prizes and mentions.
- **History** – 1 mention

At international competitions and olimpiads our students got 20 gold, silver and bronze medals. The member of the **High Achivement Center** who reaped this rewards are:

International Olympics in Mathematic and Physics - Zautykov, Kazakhstan (14-20 January 2008)

Armăşescu Vlad –***bronze medal*** – physics (Ioana Stoica)

Chirondojan Liviu - ***bronze medal*** – physics (Florina Stan)

Şuşnea Adriana –***bronze medal*** – physics (Ioana Stoica)
Bumbacea Radu – ***silver medal*** – mathematic (Cerasela Tesleanu)
Camburu Oana - ***bronze medal*** – mathematic
(Moldoveanu Severius)
Moraru Laurentiu - ***bronze medal*** – mathematic (Cerasela Tesleanu)
Olimpiadă Internațională pluridisciplinară Tuymaada – Yakutia, Republica Saha ,
Federatia Rusă (28 June – 5 July 2008)
Romanian team:
Mania Horia – ***silver medal*** – mathematic (Chiteş Costel)
Căldăraru Octav – ***silver medal*** – chemistry (Moraru Silvia)
Buciu Petre – ***bronze medal*** – chemistry (Moraru Silvia)
Tudor Vianu team:
Muraru Sînziana – ***gold medal*** – chemistry (Moraru Silvia);
Ye Kai - ***silver medal*** – mathematic (Tesleanu Cerasela)
Ciupan Andrei-Laurențiu- ***silver medal*** – mathematic
(Chiteş Costel)
Dumitrescu Dragoş – ***bronze medal*** – mathematic
(Dumitrescu Alexandra)
Popescu Victor-Cristian – ***silver medal*** – IT(Achinca Corina)
Pârvu Andrei-Bogdan – ***silver medal*** – IT(Achinca Corina)
Ilieşiu Victor-Luca – ***bronze medal*** – physics (Stoica Ioana)
Mathematics Balkaniad juniori -Vlora Albania
Bumbăcea Radu – gold medal (Tesleanu Cerasela)
Milu Alexandru – silver medal (Tesleanu Cerasela)
Munteanu Alexandru – silver medal (Tesleanu Cerasela)
Center and Eastem Europe Olympics in Informatique
Filip Ştefan – bronze medal (Cherciu Rodica)

2008-2009

In the school year **2008-2009** ,”Tudor Vianu” National High School of Computer Science had a number of 97 participants in the National Olympiads , acquiring 54 awards and honourable mentions , as follows :

- Chemistry – 7 awards and honourable mentions
- Physics– 11 awards and honourable mentions
- Computer science – 19 awards and honourable mentions
- Mathematics – 16 awards and honourable mentions
- English language and literature – 1 award

In the International Olympiads and contests, there were obtained a number of 20 gold , silver and bronze medals .
The members of the ***Performance Centre*** who obtained those medals are :

International Olympiad of Mathematics and Physics– Zautykov, Kazakhstan (14-20 January 2009)

Bumbăcea Radu – ***silver medal***- mathematics
(teacher Severius Moldoveanu)
Ciupan Andrei - ***silver medal***– mathematics
(teacher Chiteş Costel)
Sfrenț Andrei-Traian - ***bronze medal***- Physics
(teacher Florina Stan)
Pârvu Andrei - ***silver medal***-Computer Science
(teacher Achinca Corina)
Tache Radu - ***honourable mention***-Computer Science
(teacher Cherciu Rodica)

International Olympiad of Chemistry „D Mendeleev”– Ashgabat, Turkmenistan (25 April – 2 May 2009)

Muraru Sânziana – ***bronze medal***- chemistry
(teacher Silvia Moraru)

Balkan Olympiad of Mathematics Seniors – Belgrad, Serbia (25 April–2 May 2009)

Bumbăcea Radu – silver medal
Mania Horia – bronze medal

Multidisciplinary International Olympiad Tuymaada – Yakutia, The Republic of Saha , Russian Federation (30 June–8July 2009)

Bumbăcea Radu – ***gold medal***- mathematics
(teacher Severius Moldoveanu)
Poenaru Andrei– ***silver medal***- Computer Science
Căldăraru Octav – ***silver medal***– chemistry (Moraru Silvia)
Anastase Cristina – ***silver medal***– chemistry (Moraru Silvia)
Ye Kai - ***silver medal***– mathematics (Severius Moldoveanu)
Ciupan Andrei-Laurențiu- ***silver medal***– mathematics
Milu Andrei – ***gold medal*** – mathematics (Severius Moldoveanu)
Tache Alexandru – ***bronze medal***–Computer Science
Fărcăşanu Ciprian –***bronze medal***–Computer Science
Ilieşiu Victor-Luca – ***bronze medal***– Phyzics(Stoica Ioana)

Balkan Olympiad of Mathematics Juniors – Sarajevo, Bosnia-Herțegovina (25 – 30 June 2009)

Constantinescu Petru – ***silver medal***

Central Europe Computer Science Olympiad
8-14 July 2009,Târgu Mureş
Pârvu Andrei-Bogdan – ***silver medal***
Antonescu Andrei-Bogdan – ***bronze medal***
The Annual Great Moonbuggy Race – Alabama, USA (3-5 April 2009)
Team Zamolxis: Ferariu Ioana, Vlădoiu Anda, Ilieşiu Luca, Ion Cosmin, Iordache Radu, Munteanu Ene Cătălin – Team Spirit Award -*Coordinating Teachers: Moraru Silvia, Stoica Ioana*
Team Moonwalker: Mădălina Alecu, Gabriela Bombărăscu, Ramona Dorobanţu, Sorina Lupu, Patricia Vîlceanu, Ciprian Fărcăşanu – Best Design Award
Coordinating Teachers: Moraru Silvia, Stoica Ioana

AMERICAN COMPUTER SCIENCE LEAGUE – Huntsville, Alabama , USA (May 23 2009)
Mihai Gheorghe– best cumulative score– 1st Prize
Cristian Zaharia, Antonio Bărbălău – best score in test theory – 2nd Prize
The high school's team: Antonio Bărbălău, Ştefan Gramatovici, Mihai Gheorghe, Filip-Anton Voicu, Cristian Zaharia – 4th Place
Oracle Contest – S.U.A "GLOBAL MODELING COMPETITION"
Muraru Sînziana(class 12 I),, Chirondojan Liviu (CLASS 12I), Svorţov Alexandru(CLASS 12I) - ***1st Prize "ROOTY ROOFS"***
Coordinating Teacher: Rodica Cherciu
Bălmău Oana (CLASS 12E), Panait Bogdan (CLASS 12E), Puşcoi Adrian (CLASS 12E), Zabloţchi Igor – ***2nd Prize "GREEN EDITION"***
Coordinating Teacher: Gradinescu Monica

2009 - 2010

Balkan Olypiad of Computer Science Seniors – 26 – 29 November 2009, Shumen, Bulgaria
Pârvu Andrei-Bogdan – ***bronze medal***
International Olympiad of Mathematics and Physics– Zautykov, Kazakhstan (11-17 January 2010)
Milu Alexandru – ***bronze medal***- mathematics
(teacher Severius Moldoveanu)
Ciupan Andrei – ***bronze medal*** – mathematics
(teacher Chiteş Costel)
Mania Horia – ***silver medal*** – mathematics
(teacher Chiteş Costel)
Ilieşiu Victor-Luca – ***silver medal***- Physics

(teacher Stoica Ioana)
Pârvu Andrei – ***gold medal***- Computer Science
(teacher Ciobanu Corina)
Poenaru Andrei – ***bronze medal*** - Computer Science

Romanian Master of Sciences

"Tudor Vianu" National High School of Computer Science, under the auspices of the City Council organized and hosted , in Bucharest (24 February - 1 March), the 3rd edition of the contest Romanian Masters of Mathematics . Starting with this year's edition , the contest has become Romanian Master of Sciences.

Romanian Master of Sciences is an international contest of mathematics and physics, aimed at high school students, which acts as an opportunity for the best minds from various countries to exchange ideas.

Through competition and various events, the contest, Romanian Master of Sciences, intends to encourage scientific education performance.

One goal of the contest Romanian Master of Sciences is the exchange of information as to the curriculum and practices in UE member countries.

The official language of the contest Romanian Master of Sciences is English .

This year's edition was attended by students competing from England, Brazil, Russia,China, Serbia, Kazakhstan, Bulgaria, Italy, USA, Moldova and Romania.

The winners of the 3rd edition of Romanian Masters of Sciences are:

MATHEMATICS: - 1st prize (in the teams'competition): **RUSSIA**

Students:

NIE ZIPEI	CHN	GOLD MEDAL
OMELYANENKO VICTOR	RUS	GOLD MEDAL
PANCHEV LYUBOSLAV	BUL	GOLD MEDAL
BUMBĂCEA RADU	VIANU	GOLD MEDAL
SAVENKOV KIRILL	RUS	GOLD MEDAL
HAMRICK BRIAN	USA	GOLD MEDAL
LI HONGYI	CHN	SILVER MEDAL
MATDINOV MARSEL	RUS	SILVER MEDAL
BURG TEODOR VON	SRB	SILVER MEDAL
CHU TIMOTHY	USA	SILVER MEDAL
TYSHCHUK KONSTANTIN	RUS	SILVER MEDAL
FIROIU VLAD	USA	SILVER MEDAL

XU JUNNAN	CHN	SILVER MEDAL
ZHANG YIHAO	CHN	SILVER MEDAL
MILIĆEVIĆ LUKA	SRB	SILVER MEDAL
YUAN ALLEN	USA	SILVER MEDAL
CHINDEA FILIP	ROMB	SILVER MEDAL
GHIDELLI LUCA	ITA	SILVER MEDAL
BIANCHI ANDREA	ITA	SILVER MEDAL
BOYAROV IGOR	RUS	BRONZE MEDAL
PAOLINI GIOVANNI	ITA	BRONZE MEDAL
TIBA MARIUS	ROM	BRONZE MEDAL
ZHANG YICHEN	CHN	BRONZE MEDAL
BETTS LUKE	GBR	BRONZE MEDAL
CERRAHOĞLU ÖMER	ROM	BRONZE MEDAL
KELLER SAMUEL	USA	BRONZE MEDAL
PĂDUREANU VICTOR	ROMB	BRONZE MEDAL
DRĂGOI OCTAV	ROM	BRONZE MEDAL
LIDO GUIDO	ITA	BRONZE MEDAL
VALOV VIKTOR	BUL	BRONZE MEDAL
DEBORAH BARBOSA ALVES	BRZ	BRONZE MEDAL
PĂDURARIU TUDOR	ROM	BRONZE MEDAL
DAVI LOPES ALVES DE MEDEIROS	BRZ	BRONZE MEDAL
GLAUDO FEDERICO	ITA	BRONZE MEDAL
JECHEV JIVKO	BUL	BRONZE MEDAL
STOJISAVLJEVIĆ VUKAŠIN	SRB	BRONZE MEDAL
GUSTAVO LISBÔA EMPINOTTI	BRZ	BRONZE MEDAL
MAKELOV ALEKSANDAR	BUL	BRONZE MEDAL
MANIA HORIA	VIANU	BRONZE MEDAL
CARLOTTI ANDREW	GBR	BRONZE MEDAL
DEMEIO JULIAN	ITA	BRONZE MEDAL
DUMITRESCU DRAGOŞ	VIANU2	BRONZE MEDAL
SMITH JACK	GBR	BRONZE MEDAL
GU ALBERT	USA	HON. MENTION
HUGO FONSECA ARAÚJO	BRZ	HON. MENTION
STANKOV BOGDAN	BUL	HON. MENTION

PHYSICS - 1st prize (in the teams'competition)

Colegiul National de Informatica TUDOR VIANU, Team 1

Students:

ILIESIU LUCA	*Colegiul National de Informatica TUDOR VIANU*	*GOLD Medal*
IONITA MATEI	*Colegiul National de Informatica TUDOR VIANU*	*GOLD Medal*
POP ANA ROXANA	*Colegiul National de Informatica TUDOR VIANU*	*SILVER Medal*
ZUBAREV ALEXEI	*Republica Moldova*	*SILVER Medal*
ANSAR MANATULY	*KAZAKHSTAN*	*SILVER Medal*
ALEKSANDER SKLIAROV	*BULGARIA*	*SILVER Medal*
ZAHAROVITS ALBERT	*Colegiul National MIHAI VITEAZU*	*BRONZE Medal*
PIROI ANDREI	*IASI*	*BRONZE Medal*
KRISTIAN KIROV	*BULGARIA*	*BRONZE Medal*
ANGHEL CRISTINA	*Colegiul National de Informatica TUDOR VIANU*	*BRONZE Medal*
ION COSMIN	*Colegiul National de Informatica TUDOR VIANU*	*BRONZE Medal*
VRABIE CATALIN	*Colegiul National Sf. SAVA*	*BRONZE Medal*

The 17th NASA Annual Great Moonbuggy Race

Between the 9 th and 10 th of April 2010, the the 17th **edition of The** Great Moonbuggy Race, **was** organized by NASA for high-school and college students at the U.S. Space & Rocket Center, Huntsville, Alabama.

For “Tudor Vianu”, National High School of Computer Science the competition represented a great challenge, our school competing for the second consecutive time at NASA. The competition hosted 100 teams from the United States, Germany, Puerto Rico, Canada, India and… Romania. The two teams from the National Computer Science High School “Tudor Vianu” were formed by : Mădălina Alecu, Gabriela Bombărăscu, Ramona Dorobanțu, Sorina Lupu, Patricia Vîlceanu si Cosmin Iorga (11 D) that formed **Team 1: Moonbuggy Moonwalker** and Andra Filimon, Ana Borlovan, Iulian Ionașcu, Constantin Muraru, Liviu Milorad Felix (10 F & I) were the **second team**’s members, called **Moonbuggy Spark**. The teams were coordinated by teachers Silvia Moraru, headmaster of the high-school and Ioana Stoica, physics teacher.

Our school’s teams were for the among the winners, obtaining the **Safety System** prize (safest moonbuggy of the competition). We thank all of those who supported have this project, especially our sponsors: SF Travel, Total Construct Company and Astra Travel Coaches that have made this wonderful project possible.


Thanks for
supporting the
2010 race !

PROFESSIONAL PERFORMANCES AND CHARACTERISTICS OF PROGRESS

By providing training in Information Technology, the National College of Information Technology offers pupils new educational opportunities:

- access to the new information tecnologies all over the world, in all developed countries;
- learning foreign languages;
- use of IT across the curriculum and enhancing the quality of learning;
- the development of creativity, of self-assessment and of emulation in view of obtaining good results in school contests;
- widening their cultural horizon and their acquaintance with the cultural values of other countries;
- new types of assessment: computer-based texts, projects, self-assessment, assessment provided by Romanian and foreign higher education institutions.
- the production of educational software which should improve the introduction and utilization of a computer-assisted learning activity.

INTERNATIONAL PARTNERSHIP

Romania has a strategic geographical position in South-Eastern Europe. Therefore, our school's participation in joint projects is justifiable. In this way, we contribute to establishing a link between the East and the West by exchanging knowledge and information with students and teachers from other countries.

The National College of Information Technology participates in carrying out European Comenius projects, which lead to:

- achieving products whose completion contributes to pupils' enhancing their knowledge and developing their imagination;
- providing plenty of scope for the improvement of the methods teachers can then apply in their classes;
- putting together a databank likely to put the following at the disposal of teachers of each school involved: strategies, solutions, materials elaborated in other countries. All this is to be evaluated and adapted to the needs of each school;
- encouraging traditional teaching methods along with the introduction and development of the new informational techniques;

- achieving training courses based on multimedia elements and interactive means likely to ensure the best possible teacher-pupil communication.

"Tudor Vianu" National High school of Information Technology was involved in the following joint projects within the COMENIUS Program:

- **Roman Heritage in Today's Europe**
  - Coordinating country: England
  - Participating countries: Romania, Spain, Italy, France and Greece
- **Arts across Europe**
  - Coordinating country: France
  - Participating countries: Romania, Italy, Austria, Sweden
- **Spending free time**
  - Coordinating country: Germany
  - Participating countries: Romania, Italy

During the school year 2003-2004 there unreeled international projects in our high school:

„HANDS ON SCIENCE"
- Coordinating country: Portugal
- Participating countries: Romania, Greece, Italy, Spain

„LIGHT AND COLOUR"
- Coordinating country: Portugal
- Participating countries: Romania, Turkey, Cyprus

„CRESCERE"
- Scientific research project
- Participating countries: Portugal, Italy, Romania

„SCHOOL GUIDANCE IN EUROPE"
- School development project
- Participating countries: Romania, France, Poland.

ICT – QUALITY IN EDUCATION

24 – 28 November 2008

The study visit at the European level emphasises the value of the European strategy for implementation of ICT in Education.

Participant:

- ***Austria – Herbert Bachler***
- ***Estonia – Olavi Otepalu***
- ***Finnland – Tiina Kankaala***
- ***Germany – Jurge Runge***
- ***Hungary – Szilvia Rakosi***
- ***Ireland – Aidan Mcgowan***
- ***Netherland – Jeroen Lek***
- ***Norway – Eivind Borke***
- ***Spain – Laura Maria Fernandez Monzon***
- ***Turcia – Derya Yasar***
  – Yasin Akkose
- ***United Kingdom –James Tinsley***

Coordinator – prof. SILVIA MORARU „Tudor Vianu” National College of Computer Science

ICT – quality in Education - PROGRAM

Sunday, November 23rd

19:30 – 20:30	Informational meeting of the participants and organizers at ***Irisa Hotel***

Monday, November 24th

9:00 – 9:30	Welcoming the participants at “Tudor Vianu” National College of Computer Science (“Tudor Vianu” NCCS)
9:30 – 10:00	A brief presentation of the Romania Educational System (RES)
10:30 – 10:30	The Presentation of “Tudor Vianu” National College of Computer Science
10:30 – 11:00	Visiting the College
11:00 – 13:00	Presentation of participants
13:30 – 14:30	Lunch break – *Irisa Hotel*
14:30 – 16:00	The strategy of “Tudor Vianu” National College of Computer Science for Implementation of ICT in Education
16:00 – 16:30	**Discussion about the first day of the program**

Tuesday, November 25th

9:00 – 10:00	The National Strategy for Implementation of ICT in Education – meeting with Mrs. Ecaterina Andronescu, PhD, rector of PUB.
10:00 – 11:00	Presentation of AEL in Romania (meeting with Mr. Radu Jugureanu – Educational Department of Siveco Romania)
11:00 – 12:00	Presentation of AEL I – observing classes I – lesson of IT, ORACLE and Physics
12:00 – 12:30	Presentation of **Think.com**
12:30 – 13:30	Presentation of ORACLE INTERNET ACADEMY (AOI)
13:30 – 14:00	Discussion about the Implementation of ICT in Education
14:00 – 15:00	Lunch break – *Irisa Hotel*
15:30 – 17:30	Visit to“Mihai Viteazu” National College (The Implementation of ICT in Education)
17:30 – 18:00	**Discussion about the second day of the program**

Wednesday, November 26th

8:00 – 18:00	**Trip to Breaza**. Visit to “Dimitrie Cantemir” ***Military National College*** (visiting the college and discussion about Implementation of ICT and Quality in Education)
18:00 – 18:30	**Discussion about the third day of the program**

Thursday, November 27th

9:30 – 12:30	Visit to the Kindergarten n°.54 and “Ștefan Odobleja” High School – Implementation of ICT and quality in education school strategy Meeting with Marian Vanghelie, the Mayor of sector 5, Bucharest
12:30 – 14:00	Lunch break
14:30 – 16:00	Visit to “***Virgil Madgearu***” Economic College (Implementation of ICT and Quality in Education School Strategy)
19:00 – 20:30	Viewing a theatre performance (a pantomime show VIS with Dan Puric)
20:30	**Festive dinner**

Friday, November 28th

9:30 – 10:30	Workshop – ICT as support and basis for Life

Long Learning

10:30 – 11:30	Discussion, reflections, final questions
11:30 – 13:00	Evaluation, final report
13:30 –	Lunch, Departure

http://www.lbi.ro/ictineducation

Education and Culture DG

Lifelong Learning Programme

“EUROPEAN STRATEGIES OF ICT IMPLEMENTATION IN TEACHING FOREIGN LANGUAGES (THROUGH GAMES)”

Since August 2009,our school has been coordinating the multilateral partnership project Comenius EUROPEAN STRATEGIES OF IMPLEMENTING ICT IN TEACHING FOREIGN LANGUAGES (THROUGH GAMES) aims at designing and popularizing new ways of teaching foreign languages with new technologies and games. The final product (teaching and assessment activities) addresses students aged between 9 and 12. Four schools from Romania (“Tudor Vianu” National High School of Computer Science Bucharest, sector 1), Spain (CEIP Profesor Tierno Galván- in Puerto de Sagunto), Turkey (Yeşilöz İlköğretim Okulu- Ankara) and Norway (Søre Trysil skole, Østby skole and Ljørdalen skole- in Trysil, Hedmark) work and collaborats within this partnership until July 2011.

Teaching activities are based on traditional games of the four countries or adaptations of these games. In all these activities the emphasis is on using computer as an essential educational tool. Until now there have been s 2 project meetings :

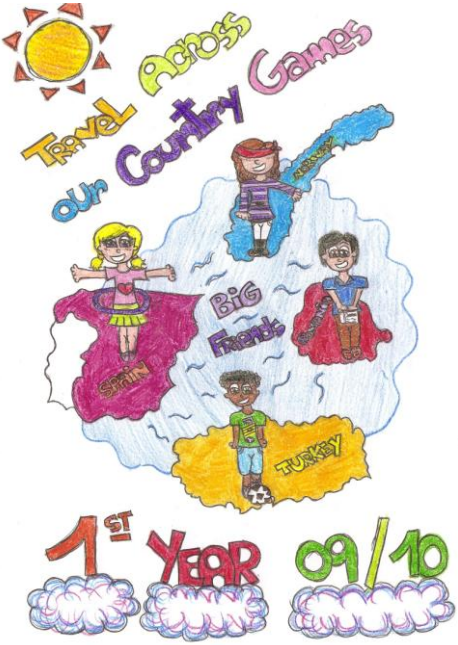
Romania, Bucharest
11-17 November 2009

Spain, Puerto de Sagunto 22-27 March 2010, meeting attended by four teachers and four students of our high school.

The project is dynamic, attractive and has the following measurable results so far:

- A presentation of the country , of Bucharest and of “Tudor Vianu” National High School of Computer Science http://lbi.ro/~engleza/
- A website with all the information about its activities, with the products made (worksheets, teaching strategies, lesson plans, educational software) and the activities demonstrated and videoed in class – see http://www.lbi.ro/ict/

The first volume of the book which includes traditional games of the four countries involved – here you can see the cover of the book:



CNITV@NASA - Proiecte NASA

Topics:

-Explore and discover

-Learn!

-Build and be a researcher together with the Nasa scientists

This is what the students and the teachers, together with Nasa experts aimed at doing.

Guided by experts from NASA we have discovered a new Universe and have broken the barriers that seemed impossible.

Project Star Count , Project HiRISE , Project Lima
Project LCROSS, Project Butterfies in Space

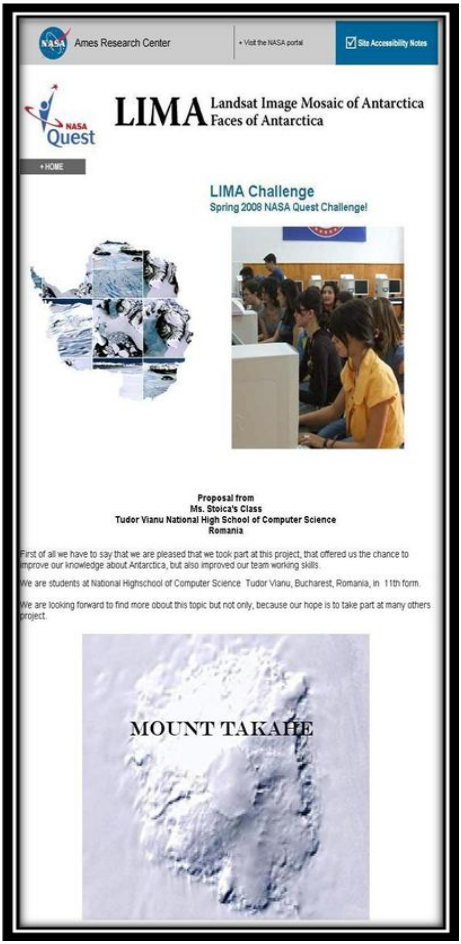
LIMA (Landsat Image Mosaic of Antarctica) is the first view (cartography) from a satellite of Antarctica, in colours and high resolution, giving anyone the opportunity to see how the continent looks like in reality. It is hoped that this new representation will revolutionize research on the continent. LIMA web site is designed as part of International Polar Year and is intended to acquaint the public with this fascinating formation. It tries to explore its various geological formations in order to succeed awareness of the importance of this continent. Last but not least, the focus is on contact with scientists from NASA and how they use images provided by satellites to study the continent.

During this competition, students will become scientists and will study the geology of Antarctica, which has never happened before. Everything will be possible by using curiosity, which is so so specific to people. NASA specialists

will design a series of steps that will make possible the study of geological formations from a new perspective on Antarctica.

Participants:
In this project there participated classes 11G and 9D.

Results:
The materials created my Vianu students were assessed by specialists from NASA.
For details visit : http://lima.nasa.gov/



Ames Research Center | + Visit the NASA portal | Site Accessibility Notes

NASA Quest

LIMA Landsat Image Mosaic of Antarctica Faces of Antarctica

+ HOME

LIMA Challenge

Spring 2008 NASA Quest Challenge!

Proposal from
Ms. Stoica's Grade 9 D Class
Tudor Vianu National High School of Computer Science
Romania

We are students from the 9th D grade of the "Tudor Vianu" National High School of Computer Science, Bucharest, Romania. We are honored for having the opportunity to participate at the LIMA Quest Challenge. In this way we had the chance to improve our team spirit and find out new interesting information about Antarctica, which we considered useful.

We enjoyed working with you at this project and we appreciated the chat session very much.

We hope you will involve us in your future projects and contests.
Thank you very much for inviting us to collaborate with you, and we hope that you will appreciate our material!

Proposal:

1 The name and/or description of your chosen ice feature
We chose the nunatak as our ice feature. A nunatak is an exposed, often rocky element of a ridge, mountain, or peak not covered with ice or snow within (or at the edge of) an ice field or glacier. The term is typically used in areas where a permanent ice sheet is present.

2 An image of your chosen ice feature

Middle section of Taylor Glacier with nunatak

Contests organized by NASA

The students from Vianu participated in :

International Aeronautics Competition for the 2007-2008 Academic Year, where they won first prize (Ferariu Ioana, Vladoiu Anda, Iliesiu Luca Victor and all from class 9D) and the first honorable mention (Ion Cosmin, Iordache Radu, Munteanu Ene Catalin, from class 9D)

International Aeronautics Competition for the 2008-2009 Academic Year, 2008 – 2009, where they won the first prize (Muraru Constantin, Milorad Felix Liviu, Muraru Sorin) and the second prize (Adam Vlad, Borlovan Ana Maria, Zavoianu Sabina, Raileanu Roberta)

International Aeronautics Competition for the 2009-2010 Academic Year, where they won the second prize (Iliesiu Luca, Ciupan Andrei) and the third prize (Adam Vlad, Muraru Sebastian, Botu Alexandru).

For details visit:

- http://aero.larc.nasa.gov/competitions.htm
- http://aero.larc.nasa.gov/comp_awardees_high_2008.htm

Year 2007-2008

International Team Awards

First place

Ioana Ferariu
Anda Claudia Vladoiu
Luca Victor Iliesiu
(All Grade 9)
National High School of Computer Science, Tudor Vianu
Bucharest, Romania

Second Place

Adrian Zelaya (Argentina, Grade 11)
Uny Chan (Hong Kong, Grade 11)
United World College of the Adriatic
Duino, Italy

Third place

Fernanda Laguarda
Viviana Lombardi
Erica Guerendiain
Santiago Marenco
Thiago Ceballos
Leticia Dominguez
(All Grade 12)
Ecuela de la Construccion
Montevideo, Uruguay

Honorable mention international teams

Radu Iordache
Catlin Munteanu-Ene
Cosmin Ion
(All Grade 9)
National High School of Computer Science, Tudor Vianu
Bucharest, Romania

Year 2008-2009

International Division -- Teams

First Place
Airplane Prototype Super Sonic VOYAGER X
Muraru Sebastian, grade 9
Felix Liviu Milorad, grade 9
Muraru Costin Grigore, grade 9
National High School of Computer Science, Tudor Vianu
Bucharest, Romania

Second place
PAPERWING
Vlad Adam, grade 9
Ana-Maria Borlovan, grade 9
Sabina Zavoianu, grade 9
Roberta Raileanu, grade 9
National High School of Computer Science, Tudor Vianu
Bucharest, Romania

Third place
Supersonic Flight Project
Emmanuel Vlatakis, grade 11
Dimitrios Tsounis, grade 10
High School Of Kareas
Athens, Greece

Year 2009 - 2010

Non U.S. – Team

Place	Student Name & Grade	School	Design Concept*	Paper
1st Place	Tsz Hin Chung, *11* Mei Kwan Lai, *11* and Man Hoi Wong, *11*	Yew Chung International Secondary School *Hong Kong*	Fly Fish	PDF (6.5MB)
2nd Place	Luca Illiesiu, *11* Andrei Ciupan, *12*	Tudor Vianu, National High School of Computer Science *Bucharest, Romania*	HC-1 Aircraft Concept	PDF (912KB)
3rd Place	Botu Alexandru, *10* Adam Vlad, *10* Sebastian Muraru, *10*	Tudor Vianu, National High School of Computer Science *Bucharest, Romania*	Firefly	PDF (1.4MB)

This project is coordinated by The National Institute of Biomedical Research and Space Research (TNIBRSR) and is a partnership between TNIBRSR, BioServe Space Technologies (Colorado University) and Baylor College Medicine. Partners in the project are Houston Endowment Inc. and Howard Hughes Medical Institute.

Vianuessa cardui butterflies in space! On November 16, 2009, the larvae hatched six days earlier, flew on board the Spatiel vessel Atlantis to International Space Station. Larvae successfully managed to feed, to grow, to form the stern and turn into adult butterflies. Space history experiment was finished on December 10, 2009. Photos and video clips will be posted on the project website, as the stundents can compare them with those of living organisms on Earth.

The project should include:

1.The Natural Science Student's Diary Page
2. Research Plan
3. Information lifecycle of Vanessa cardui
4. Planning investigations

- Study the behavior of objects, organisms, and events in the environment and in conditions of microgravity.
- Plan and coordinate a simple investigation
- Use tools and methods to gather data and extend senses, then analyze and interpret data
- Use data to form an explanation reasonably.
- Think critically, and the relationship between evidence and logical explanations.
- Use mathematics in all aspects of scientific investigation.
- Communicate investigations and explanations.

Data analysis and conclusions

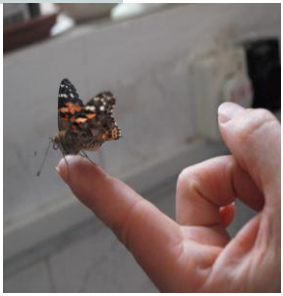
- Formulate questions that can be addressed with data and collect, organize and present relevant data to answer them.

Participants

- Involved in this project were pupils of the 8th, 9th B, 10th F and I and the 11th, Coordinating teachers were Moraru Silvia and Ioana Stoica.

Our celebrities:
Butterflies
Vianuenessa
cardui

Testing laboratory conditions and environment



(The flowers provide high humidity)

Data acquisition

Measuring the size of the butterflies

Cassini - Scientist for a Day

Cassini contest - Scientist for a Day is an opportunity for students worldwide to learn about the Cassini mission (Casini spacecraft is orbiting Saturn and its satellites, Tethys, Titan and Dyone). Students will study the video with the Cassini team members (researchers, engineers, mission planners, project managers, etc.), will present details about the contest and will speak of images submitted by spacecraft and new theories based on images submitted by probe. Students will work alone or in small groups to decide what orb deserves being investigated in detail, will design the research plan and write an essay in which he will justify. In this way, students will learn to think like real scientists.
Will learn to investigate and argue in favor of a particular subject, and proceed as Cassini scientists.
For more information: http://www.nasa.gov/mission_pages/cassini/

Participants:
From "Tudor Vianu" National High School of Computer Science were involved several teams, along with many other teams from schools and colleges throughout the world.

Among the winners were the students: ***Tanase Alexandru, Milu Alexandru, Copoiu Liviu, Ionascu Iulian,*** all from the 9th I grade which won 1st prize, ***Vladoiu Anda, Iliesiu Luca, Iordache Radu, Ferariu Ioana, Valceanu Patricia, Ion Cosmin,*** all from the 11th D grade and ***Popescu Camelia, Zaharia Cristian, Clement Horia***, from the 8th grade , (all had won the II nd prize).
Coordinating teachers: **Moraru Silvia**, **Stoica Ioana**

SCHOOLING PLAN – SCHOOL YEAR 2010 – 2011

- class 9th - mathematics - Computer Science - intensive Computer Science class - 240 openings;

SECONDARY EDUCATION CALENDAR for admission to the 2010-2011 school year :

- 17 to 24 June 2010. ENROLMENT - filling the forms for admission to 9th grade
- 18 to 26 June 2010 Checking by parents and applicants of the edited computer files, correcting errors in the computerized database and corrected listing of computer files;
- July 2, 2010 Distribution State computer of 8th grade graduates to high school
- July 3, 2010 Results are announced
- July 5, 2010 announcement by each unit of high school to the list of candidates who have been distributed to that unit;
- July 5 to July 15, 2010 Submission of registration files in schools where candidates have been assigned.

SCHEDULE

a.m. 7.30 – 13.20 Class - Seventh, Eighth,
Class - XI of A, XI B, XI C, XI D
XI of E to F XI, the XI G XI of H, I, XI
Class - XII of A, XII B, XII C, XII D
XII of E to F XII, the XII G XII of H

p.m. 13.30 – 19.20 class - the ninth-A, IX B, IX-C, IX-D
s ninth, ninth F, G, ninth, ninth H
Classes - X-A, the B-X, X, C, X to Y,
X to E to F of X, X, of G, the X-H
class - the V-a, VI.

Chapter 2
INSTRUCTIONAL ITINERARIES

Basic Training

In the 9th and 10th grades, pupils are given a basic training in "Mathematics and Sciences", as well as in "Technological Education".

Mathematics - plays an important part in pupils' general and special education. "TUDOR VIANU" National College of Information Technology provides 4 classes of mathematics per week according to the new secondary education curriculum for the theoretic type, specialization: mathematics – IT.
The new mathematics curriculum M1 covers the core syllabus and the deep-study curriculum, so that our students benefit from one extra hour per week. The study of mathematics in close relation with computer studies contributes to the development of students' personalities and their integration in society.

Physics and Chemistry - two experimental sciences, harmoniously blend with IT in this school specializing in computer programming.
The new curriculum for Physics 1 focuses on the study of fundamental concepts, at the same time developing pupils' creativity and capacity for explaining physical laws along logical mathematical lines.
Chemistry, in its new curriculum, C1, aims at developing pupils' ability to understand all physical and chemical phenomena. The correlation chemistry-physics-IT ensures pupils' creative learning across curriculum.
The impact of IT on experimental sciences leads to a progression of knowledge beyond language, enabling computer simulations of physical and chemical phenomena which are impossible to be performed in the laboratory.
In the academic year 2010-2011, the teaching staff of this school intends to attend more to the needs of gifted students by rearranging the curriculum at the school's disposal. Thus, CSD classes within the fields of study "Mathematics and Experimental Sciences" and "Technologies" will include special courses for all pupils in the11th and 12th grade.

Specialization. The Ability to Join the Labour Market

"TUDOR VIANU" National High school, which qualifies secondary education specialists in IT, is equipped with:

- hardware: computers logged on to the network;

- software: text editors, programming languages, network programs (LINUX, WINDOWS NT), database languages (ACCESS, FOXPRO, SQL), graphic programs, games, browsers for Internet surfing;
- TV sets, video players, video-cameras;
- Slide projections, overhead projectors;
- Multimedia system;

The core and extra syllabuses include:

- Algorithms and programming languages (Pascal, C);
- computerized editing;
- Internet surfing and web-page design;
- Basics of operational search: graphs, linear programming;
- Programming techniques: greedy, divide et impera, backtracking, branch and bound, dynamic programming;
- Basics of informational system analysis and design;
- Database, database languages;
- Visual Basic, Delphi.

The present school curriculum offers pupils vocational qualification and preparation for employment by:

- forming abilities to initiate and lead the development of certain practical applications;
- developing abilities to initiate and coordinate a certain practical assignment; applying the requirements of team work in carrying out projects: establishing the leader, communication between members, distributing the tasks, observing the deadline;
- evaluation: self-assessment, group evaluation, school evaluation in Students' Sessions of Papers and Reports, evaluation at the level of the local community through education –business partnerships.

At the end of their school years, pupils take an exam gaining a qualification as a secondary education specialist in IT. The exam consists of the following:

- carrying out a project;
- a practical test on the computer in database, professional editing and operation system;
- the development of a computer application containing the solutions of programming problems in the Pascal or C languages (student's choice).

A **“European Computer Driver’s License Centre”** is functioning within “Tudor Vianu” National College of IT.

ECDL is similar for IT certifications such as TOEFL or Cambridge certificate of language knowledge. Permit ECDL obtained is valid for an indefinite period.

The permit gives its holder a standard basis of IT knowledge required in the new evolving information society.

With European Computer Driving Permit you increase occupational mobility and can use the computer effectively and productively regardless of age, profession or field of activity.

European Computer Driving license (ECDL - European Computer Driving Licence) is the standard document for the basic qualification in computing, internationally recognized, showing the holder's ability to effectively use a computer.

"Tudor Vianu" has been collaborating with ECDL Romania for more than 7 years , being an accredited center. This year, 51 students from year end had the opportunity to sample the digital equivalent of the baccalaureate in 2010. By obtaining the digital certificate, they were forced to submit to sample, obtaining this certification based on the ECDL tests previously supported by „Tudor Vianu” National High school of Computer Science

Advantages of ECDL :

Collection European Computer Driving Licence is recognized at the European and international level as a standard by which employers can establish computer operating skills of current and potential employees that staff may increase its future employment prospects.

Benefits of ECDL program for candidates:

- Collection of internationally recognized qualifications;
- Open new opportunities to get a better job or a scholarship;
- Improving prospects for career advancement ;
- Increase the competence, confidence and motivation ;
- Reduce the likelihood of losing a service offer ;
- Provides a basis for subsequent specialization ;

The **ORACLE INTERNET ACADEMY** courses facilitate both initiation in the most proficient solutions that work on the internet and knowledge accumulation, which may contribute to professional training. Thus, during the 2003-2004 school year, the course INITIATION IN ORACLE 91

consists of two modules: “DATABASE MODELING AND ENTITY – RELATIONSHIP DESIGN” and “SQL PROGRAMMING”.

The facilities in “Tudor Vianu” National High school of IT allow lesson development through e-learning technology i.e. the students work on the internet in their personalised accounts.

The “DATABASE MODELING AND ENTITY – RELATIONSHIP DESIGN” module was made for managers, analysts, designers or ORACLE base administrators. ORACLE INTERNET ACADEMY succeeded in making the module accessible to students and at the same time keeping it connected to the real business world.

Student activities develop their creativity and conceptual understanding of business needs. The students learn to translate these needs in an ER diagram and, later on, in a relational database.

The “SQL PROGRAMMING” module presents ORACLE 91 and assures acquirement of the SQL functions for taking information from a database. The two modules give the students the possibility of thorough learning through on-line didactic activities. The students that attend the ORACLE INTERNET ACADEMY courses benefit from an ORACLE environment especially created called PROJECT MARVEL where they can test the SQL studied functions.

Every year ORACLE CORPORATION organizes the DATA MODELING COMPETITION the students of ORACLE INTERNET ACADEMY who present semester projects. For the 2003 edition of DATA MODELING COMPETITION there registered 40 teams from four continents: Europe, America Asia and Australia. The competition theme was related to how a non-profit organisation can be helped to increase its profits by the use of IT.

The “THE SYSTEM” team was awarded the first prize at the 2003-2004 edition. For the 2004-2005 edition there registered more than 100 teams. The “SYNAPTIC” team of CNITV was awarded the first prize.

On 15th of February 2005 the theme of the press release impressed us all: **‘The Romanian students are being awarded for the second time in the International Contest <Data Modeling Competition>’.**

For the 2005-2006 edition were registered 12 teams (local contest).

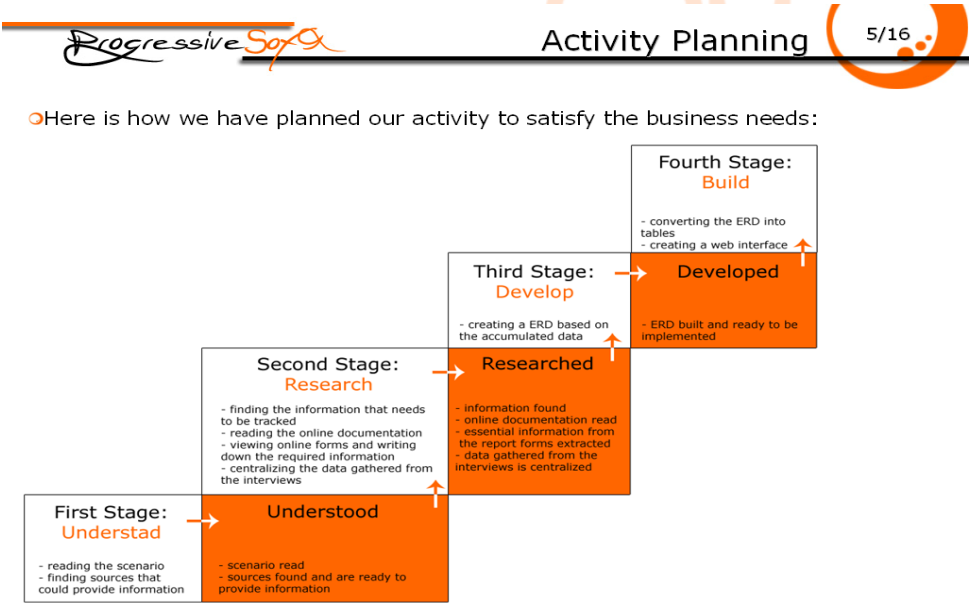
The works were noted and the first and second have participated in the National and International edition of the Contest **‘Data Modeling Competition’.**

The members of the team: Alin-Alexandru Olaru, Alexandru Dita, Constantin Ciprian Septimiu, Serban Nistor and their teacher Corina Chinca have obtained the 4th place with the work EVOMORPH.

The members of the team: Ioana Pestritu, Alexandru-Mihai Prisacariu,

Bogdan Toma, Alexandru Ene and their teacher Livia Toca have obtained 3rd with the work WEBPULSE.

The Oracle Academy Programme trained up 107 11th and 12th grade students in 2006-2007 School year. The students were encouraged and supported to participate in the Global Date Modeling Competition. The contest simulated working techniques similar to those in real life. In this way, the students acquired technical managerial abilities necessary in IT companies all over the world. Two of the projects created by students have the following interfaces.



The Romanian students have won important prizes at the database configuration competition organized by Oracle Academy in 2009.The annual competition designed to all students from Oracle Academy centers from all around the world, challenge the teams to configure efficiently database in our actual economy.

In 2009, students were asked to create databases which could help a producer motorizing and decreasing the impact induced on the environment. This is the fourth consecutive year in which Romania obtained the first three prizes within this competition.

The winning teams include the following:

- first prize -"Tudor Vianu" National High school of Computer Science
  - supervising teacher: Rodica Cherciu
  - name of the project: Rootie roofs
- second prize -"Tudor Vianu" National High school of Computer Science supervising teacher: Monica Gradinescu
  - name of the project: Green edition

First prize winners won a trip to Redwood Shores Oracles Headquarters, California and they had the opportunity to submit their project. All participants projects (around 100 teams) were evaluated by a volunteer team, field experts and were appreciated based on technical economical and communication qualities.

What is Think.com?

Think .com is an application used by pupils and teachers for creating web pages in a pleasant, rapid way.

Using the tools provided by think.com, students benefit from a large audience who make team authors of multimedia projects viewed by all members of the global think.com.

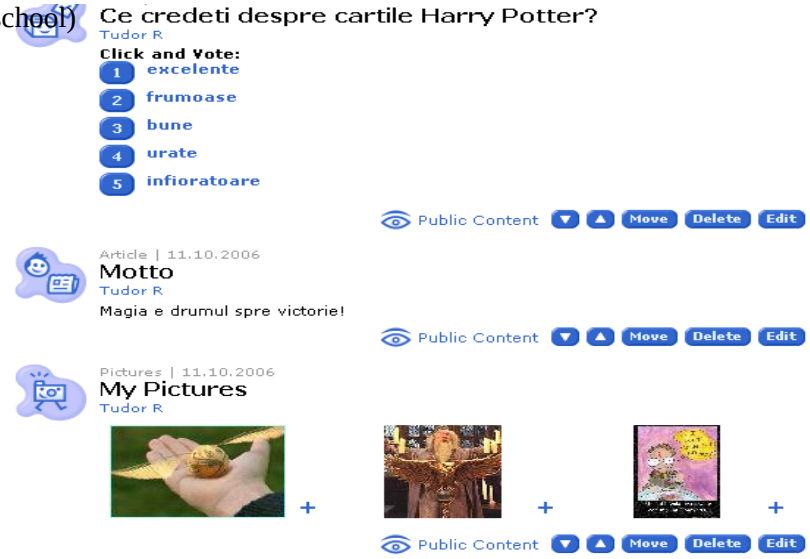
This application is based on the use of partterns and so, HTML knowledge or any other programming language is not necessary. A page can be ready in a few minutes with text, list, picture and other content forms.

Think.com is a useful application meeting the needs of teachers and students and has following advantages:

- The sense of audience: the students can share their work with people from their town or from other countries.
- Easy access: as think.com is based on internet, the access is permitted wherever there is an internet link, which makes think.com the ideal space for an online portfolio.
- Flexibility: the possibility of downloading any application from one’s own computer encourages the use of the favourite programs.
- Motivation and emotionality: the work with IT can be an important motivation both for students and for teachers. This can significantly reduce the time the student spends to complete his task.

- Integration: the regular use of the technique by the teachers and students become easy and fun by Tihink.com
- It is free: the main advantage of think.com, as part of the philanthropic initiative of the Oracle Educational Foundation, is that it is free of charge. Schools do not have to buy special computer or software in order to use think.com. The connection to the internet is enough.
- Oracle Educational Foundation hopes that think.com will become an integral part of the students' daily study or other activities.
- Security: the Internet can be a dangerous place for the students. Think.com offers a safe environment for students to learn about web pages an email.
- Efficient communication: teacher can write online letters to parents, send their students e-mails and exchange opinions and ideas with other teachers all over the world.

TUDOR VIANU National College of Information Technology joined Think.com as a pilot member for Romania in 2006-2007 school year. The 54 participating students in the national contest "The book and the internet" ranked first with the project "1984" coordinated by Iulia Manicea (high school) and again first with "Harry Potter" coordinated by Rodica Cherciu (middle school) and second with the project "Romeo and Juliet" coordinated by Corina Achinca (high school)



THINK.COM program

This product used by trained teachers was implemented at an international level. There were chosen 7 cities where training process could be performed: Bucharest, Buzau, Focsani, Iasi, Craiova, Sibiu, Cluj.

The training interval was between 26 and 30 November 2007, during which daily another group of teachers was trained.

"Tudor Vianu" National High school of Computer Science instructed teachers from 42 cities under the supervision of four leading instructors: Corina Ciobanu, Rodica Cherciu, Catalina Enescu, Livia Toca.

Also, 25 teachers from our high school have participated in think.com site utility course. "Tudor Vianu" National High school participated in the second edition of the National THINK.com competition in 2008 with 2 projects coordinated by the following teachers: Silvia Moraru, Ioana Stoica, Rodica Cherciu and Corina Ciobanu.

The goals of this competition are: usage of Think.com instruments, developing teamwork and creativity, sharing knowledge, IT integration in interdisciplinary activities with educational and formative role, connection between students, society and the environment, forming attitude through personal implication and solution answers.

Within this program unfolds the International Competition Thinkquest attended with 4 projects by our College coordinated by Ioana Stoica, Iulia Manicea, Rodica Cherciu and Corina Ciobanu.

During 2009-2010 school year, Tudor Vianu National High school of Computer Scicence offers the 5th graders an optional course: THINK.com. This course offers the initiation possibility for students in creating web pages and accomplishing cross curricular projects, which develop the sense of beauty, puts in touch with students from all over the country and abroad, substantiating the trainings in all curriculum school subjects, by approaching interdisciplinary problems.

Pl/SQL Course:

Beginning with 2008 Oracle company introduces PL/SQL course in Romania. This course will be held by trained teachers from PL/SQL Oracle Internet Academy. The PL/SQL training will take place during the summer of 2008 at national level.”Tudor Vianu”National High scholl will be represented by teacher Corina Ciobanu as instructor and the following teachers: Rodica Cherciu, Catalina Enescu, Monica Gradinescu, Livia Toca, VIctor Manz.

For students which would like to attend to a marketing career, economic studies, informational technology, commercial activities, data base modeling, these courses are the basis required for such activities and for developing knowledge from any study branch.

This course includes procedural language, SQL language extension. Through a new approach, based on projects, students learn logical procedural constructions using variables, constants, conditional instructions and iterative controls.

The students have the opportunity to take the secondary exam necessary for the Oracle Certified Associate.

During 2008-2009 school year, the teachers Elena Dragan and Roxana Mihai took these courses.

Chapter 3
OBJECTIVES

The development of science has made it necessary for education to train highly qualified specialists. The steps towards this goal are:

- all-round training – secondary education: 9th and10th grades
- special training – secondary education: 9th and 10th grades
- specialization – higher education
- completion – post-graduate studies, Ph.D.

“TUDOR VIANU” National College of Information Technology contributes substantially to the training of future specialists in IT, banking and business.

By means of the general training provided by the department for MATHEMATICS– IT, as well as of the special training provided by the department for MATHEMATICS – IT – intensive IT,they can qualify secondary education specialists in software.

The pupils enrolled at this school have a high intellectual potential confirmed by the high marks obtained at the entrance examination, on the basis of which they join this school. They are interested in acquiring a solid all-round training, as well as training in state-of-the-art technology.

Through special training programs, the teachers fully contribute to “polishing” gifted pupils so that the latter enjoy appraisal at national and international contests (Olympiad). The team of teachers supports and contributes to the improvement of the elite students, with remarkable results at the national and international contests, which involve a number of measures of special preparation for these competitions, at “The Performance Centre” of “Tudor Vianu” National College of IT.

Chapter 4

SCHEDULE

Curricular area Disciplina	Class								
	V	VI	VII	VIII	TC	CD	TC+CD	CDS	Written disposition for acknowledging the curriculum
LANGUAGE AND COMMUNICATION :									
Romanian language	5	4	4	4	17	-	17	-	3368/11.04.2001
First Foreign Language	2	2	2	2	8	-	8	-	3368/11.04.2001
Second Foreign Language	2	2	2	2	8	-	8	-	3368/11.04.2001
Limba latină	-	-	-	1	1	-	1	-	3368/11.04.2001
MATHEMATICS AND SCIENCES:									
Mathematics	4	4	4	4	16	-	16	-	3368/11.04.2001
Physics	-	2	2	2	6	-	6	-	3368/11.04.2001
Chemistry	-	-	2	2	4	-	4	-	3368/11.04.2001
Biology	1	2	2	1	6	-	6	-	3368/11.04.2001
MAN AND SOCIETY :									
• Civic Culture	1	1	1	1	4	-	4	-	3368/11.04.2001
• History	1	1	1	2	5	-	5	-	3368/11.04.2001
• Geography	1	1	1	2	5	-	5	-	3368/11.04.2001
• Religion	1	1	1	1	4	-	4	-	3368/11.04.2001
ARTS :									
• Plastical education	1	1	1	1	4	-	4	-	3368/11.04.2001
• Musical education	1	1	1	1	4	-	4	-	3368/11.04.2001
SPORT :									
• Sport	2	2	2	1		-		-	3368/11.04.2001
TEHNOLOGII :									
• Technological education	1	1	1	1	4	-	4	-	3368/11.04.2001
• IT	1	1	1	1		-		4	3368/11.04.2001
COUNSEL AND GUIDANCE :									
• Counsel	1	1	1	1	4	-	4	-	3368/11.04.2001
TOTAL	**25**	**27**	**29**	**30**	-	-	-	4	3368/11.04.2001

9th Grade

Mathematics - IT ; intensive IT (9 th A, B, C, D, E, F, G, H grades)

Curricular area Disciplina	Class								
	TC	CD	TC+CD	CDS	TC	CD	TC+CD	CDS	Written disposition for acknowledging the curriculum
LANGUAGE AND COMMUNICATION :									
• Romanianlanguage	3	1	4	-	24	8	32	-	3410/16.03.2009
• Second Foreign Language	2	-	2	-	16	-	16	-	3410/16.03.2009
• First Foreign Language	1	1	2	-	8	8	16	-	3410/16.03.2009
MATHEMATICS AND SCIENCES:									
• Mathematics	2	2	4	-	16	16	32	-	3410/16.03.2009
• Physics	2	1	3	-	16	8	24	-	3410/16.03.2009
• Chemistry	1	1	2	-	8	8	16	-	3410/16.03.2009
• Biology	1	1	2	-	8	8	16	-	3410/16.03.2009
MAN AND SOCIETY :									
• History	1	-	1	-	8	-	8	-	3410/16.03.2009
• Geography	1	-	1	-	8	-	8	-	3410/16.03.2009
• Logică	1	-	1	-	8	-	8		3410/16.03.2009
• Religion	1	-	1	-	8	-	8	-	3410/16.03.2009
ARTS :									
• Musical education	-	-	1	-		-	8	-	3410/16.03.2009
• Plastical education	-			-				-	3410/16.03.2009
TEHNOLOGII :									
• TIC	2	-	2	-	16	-	16	-	3410/16.03.2009
• IT :	-	1	1	3	-	8	8	48	3410/16.03.2009
○ IT - theory		*1*	*1*			*1*	*1*		3410/16.03.2009
○ IT - lab				*3*				*48*	3410/16.03.2009
SPORT :									
• Sport	1	-	1	-	8	-	8	-	3410/16.03.2009
TOTAL	**19**	**9**	**28**	**3**	**152**	**72**	**224**	**48**	3410/16.03.2009
	31				**272**				

10th Grade

Mathematics - IT ; intensive IT (10th *A,B,C,D,E,F,G,H*)

Curricular area Disciplina	Class								Written disposition for acknowledging the curriculum
	TC	CD	TC+CD	CDS	TC	CD	TC+CD	CDS	
LANGUAGE AND COMMUNICATION :									
• Romanian language	3	-	3	-	*24*	-	*24*	-	3410/16.03.2009
• Second Foreign Language	1	1	2	-	*16*		*16*	-	3410/16.03.2009
• First Foreign Language	2	-	2	-	*8*	*8*	*16*	-	3410/16.03.2009
MATHEMATICS AND SCIENCES:									
• Mathematics	2	2	4	-	*16*	*16*	*32*	-	3410/16.03.2009
• Physics	2	1	3	-	*16*	*8*	*24*	-	3410/16.03.2009
• Chemistry	1	1	2	-	*8*	*8*	*16*	-	3410/16.03.2009
• Biology	1	1	2	-	*8*	*8*	*16*	-	3410/16.03.2009
MAN AND SOCIETY :									
• History	1	-	1	-	*8*	-	*8*	-	3410/16.03.2009
• Geography	1	-	1	-	*8*	-	*8*	-	3410/16.03.2009
• Philosophy	1	-	1	-	*8*	-	*8*		3410/16.03.2009
• Religion	1	-	1	-	*8*	-	*8*	-	3410/16.03.2009
ARTS :									
• Plastical education	-	1	1	-	-	*8*	*8*	-	3410/16.03.2009
• Musical education	-			-	-			-	3410/16.03.2009
TEHNOLOGII :									
• TIC	1	-	1	-	*8*	-	*8*	-	3410/16.03.2009
• IT	-	1	1	3	-	*8*	*8*		3410/16.03.2009
○ IT -theory	-	*1*	*1*		-	*8*	*8*	*48*	
○ IT - lab				*3*			*8*		
Antreprenorial Education	1	-	1	-		-	*8*	-	3410/16.03.2009
SPORT :									
• Sport	1	1	2	-	*8*	*8*	*16*	-	3410/16.03.2009
TOTAL	**19**	**9**	**28**	**3**	*152*	*72*	*224*	*48*	
	31				*272*				

11th Grade

Mathematics - IT ; intensive IT (11th A,B,C,D,E grades)

Curricular area Disciplina	Class								
	TC	CD	TC+CD	CDS	TC	CD	TC+CD	CDS	Written disposition for acknowledging the curriculum
LANGUAGE AND COMMUNICATION :									
• Romanian language	3	-	3	-	15	-	15	-	3410/16.03.2009
• Second Foreign Language	2	-	2	-	10	-	10	-	3410/16.03.2009
• First Foreign Language	2	-	2	-	10	-	10	-	3410/16.03.2009
MATEMATICĂ ŞI ŞTIINŢE ALE NATURII :									
• Mathematics	2	2	4	1	10	10	20	5	3410/16.03.2009
• Physics	2	1	3	1	10	5	15	5	3410/16.03.2009
• Chemistry	1	-	1	1	5	-	5	5	3410/16.03.2009
• Biology	1	-	1	-	5	-	5	-	3410/16.03.2009
MAN AND SOCIETY :									
• History	1	-	1	-	5	-	5	-	3410/16.03.2009
• Geography	1	-	1	-	5	-	5	-	3410/16.03.2009
• Economy	1	-	1	-	5	-	5	-	3410/16.03.2009
• Religion	1		1		5		5	-	3410/16.03.2009
TEHNOLOGII :									
• IT	-	4	4		-	20	20		3410/16.03.2009
SPORT :									
• Sport	1	-	1	-	5	-	5	-	3410/16.03.2009
TOTAL	**18**	**7**	**25**	**3**	90	35	125	15	
	28				*140*				

Mathematics - IT ; intensive IT (11th F,G,H,I grades)

Curricular area Disciplina	Clasa								
	TC	CD	TC+CD	CDS	TC	CD	TC+CD	CDS	Written disposition for acknowledging the curriculum
LANGUAGE AND COMMUNICATION :									
Romanianlanguage	3	-	3	-	12	-	12	-	3410/16.03.2009
• Second Foreign Language	2	-	2	-	8	-	8	-	3410/16.03.2009
• First Foreign Language	2	-	2	-	8	-	8	-	3410/16.03.2009
MATHEMATICS AND SCIENCES:									
• Mathematics	2	2	4	-	8	8	16	-	3410/16.03.2009
• Physics	2	1	3	1	8	4	12	4	3410/16.03.2009
• Chemistry	1	-	1	-	4	-	4	-	3410/16.03.2009
• Biology	1	-	1	-	4	-	4	-	3410/16.03.2009
MAN AND SOCIETY :									
• History	1	-	1	-	4	-	4	-	3410/16.03.2009
• Geography	1	-	1	-	4	-	4	-	3410/16.03.2009
• Economy	1	-	1	-	4	-	4	-	3410/16.03.2009
• Religion	1		1		4		4	-	3410/16.03.2009
TEHNOLOGII :									
• IT :	-	4	4	3	-	16	16	24	3410/16.03.2009
IT - theory	-	4	4		-				
IT - lab	-			3	-				
SPORT :									
• Sport	1	-	1	-	4	-	4	-	3410/16.03.2009
TOTAL	**18**	**7**	**25**	**4**	72	28	100	28	
	29				*128*				

12th Grade

Mathematics - IT ; intensive IT (12th A,B,C grades)

Curricular area Disciplina	Class								
	TC	CD	TC+CD	CDS	TC	CD	TC+CD	CDS	Written disposition for acknowledging the curriculum
LANGUAGE AND COMMUNICATION :									
• Romanian language	3	-	3	-	9	-	9	-	3410/16.03.2009
• Second Foreign Language	2	-	2	-	6	-	6	-	3410/16.03.2009
• First Foreign Language	2	-	2	-	6	-	6	-	3410/16.03.2009
MATEMATICĂ ŞI ŞTIINŢE ALE NATURII :									
• Mathematics	2	2	4	1	6	6	12	3	3410/16.03.2009
• Physics	2	1	3	1	6	3	9	3	3410/16.03.2009
• Chemistry	1	-	1	1	3	-	3	3	3410/16.03.2009
• Biology	1	-	1	-	3	-	3	-	3410/16.03.2009
MAN AND SOCIETY :									
• History	1	-	1	-	3	-	3	-	3410/16.03.2009
• Geography	1	-	1	-	3	-	3	-	3410/16.03.2009
• Philosophy	1	-	1	-	3	-	3	-	3410/16.03.2009
• Religion	1	-	1	-	3	-	3	-	3410/16.03.2009
TEHNOLOGII :									
• IT	-	4	4	3	-	12	12		3410/16.03.2009
SPORT :									
• Sport	1	-	1	-	3	-	3	-	3410/16.03.2009
TOTAL	18	7	25	3	54	21	75	9	
	28				84				

Mathematics - IT ; intensive IT (12 D,E,F,G,H grades)

Curricular area Disciplina	Clasa								
	TC	CD	TC+CD	CDS	TC	CD	TC+CD	CDS	Written disposition for acknowledging the curriculum
LANGUAGE AND COMMUNICATION :									
Romanian language	3	-	3	-	15	-	15	-	3410/16.03.2009
• Second Foreign Language	2	-	2	-	10	-	10	-	3410/16.03.2009
• First Foreign Language	2	-	2	-	10	-	10	-	3410/16.03.2009
MATHEMATICS AND SCIENCES:									
• Mathematics	2	2	4	1	10	10	20	5	3410/16.03.2009
• Physics	2	1	3	-	10	5	15	-	3410/16.03.2009
• Chemistry	1	-	1	-	5	-	5	-	3410/16.03.2009
• Biology	1	-	1	-	5	-	5	-	3410/16.03.2009
MAN AND SOCIETY :									
• History	1	-	1	-	5	-	5	-	3410/16.03.2009
• Geography	1	-	1	-	5	-	5	-	3410/16.03.2009
• Philosophy	1	-	1	-	5	-	5	-	3410/16.03.2009
• Religion	1	-	1	-	5	-	5	-	3410/16.03.2009
TEHNOLOGII :									
• IT	-	4	4	3	-	20	20	30	3410/16.03.2009
SPORT :									
• Sport	1	-	1	-	5	-	5	-	3410/16.03.2009
TOTAL	18	7	25	4	90	35	125	35	

Chapter 5

OUTLINE OF OPTIONAL COURSES

Physics

1. **Optional Course: “The evolution of physical systems”**
   - ✓ Course duration: 1 year (1 class per week)
   - ✓ The course is aimed at 11th grade students

Argument

The development and implementation of the new curriculum have been done bearing in mind, among others, the possibility of creating individual learning processes through a flexible curricular offer, adapted to fit the school’s specifics, as well as the students’ interests.

The evolution of physical systems is a complex topic which meets the students’ desire to explore and discover the environment.

This topic is notably reflected in the national curriculum, both formal and informal. This optional course begins with the basic competences of the discipline, which are defined in the general syllabus, and reaches new specific competences, through operating with new subjects and chapters, not included in the general syllabus.

The program includes new specific skills, related to those present in the general syllabus, as well as content that will help build these skills.

Motivation

Understanding the physical phenomena which lead to the evolution of all physical systems is essential to the social, behavioural and cognitive development of the high school student. The evolution of any physical system is governed by certain laws, whose form depends both on the nature of the respective system and its interactions with the environment. Thus, each constituent of a physical system has its own clearly defined purpose within the system. The evolution of a physical system is influenced by the behaviour of its constituents, as well as by other physical systems.

This course offers students:

- ✓ a strong motivation to analyse what goes on around them;
- ✓ means to explore and explain the phenomena that lead to the evolution of physical systems, in various situations
- ✓ a guide to social behaviour, bearing in mind the interaction of all physical systems

Teachers

This course has been created and is held by prof. Florina Stan and prof. Corina Dobrescu, graduates of the University of Bucharest – Faculty of Physics.

Suggestions for teachers

- ✓ Use classic oral assessments, such as debates or exercises.
- ✓ Use multiple answer type written assessments.
- ✓ Use active methods, such as discovery, exercise and proof by argumentation to build durable competences.
- ✓ Make observations on individual worksheets.
- ✓ Have students write essays, projects and portfolios.
- ✓ Include multimedia technologies in the teaching and learning processes.

2. Optional Course: “Laboratory techniques”

- ✓ Course duration: 1 year (1 class per week);
- ✓ The course is aimed at 11th and 12th grade students;

Motivation

Laboratory techniques classes are vital to the development of rational thinking and experimenting skills.

Practical exercises are:

- ✓ **Assignments** that are solved through reason, experiment, application of the laws and specific methods of physics (with the help of mathematics), graphic representation and interpretation of experimental results.
- ✓ **An essential element of the teaching and learning processes** because it allows for a better, wider and more durable understanding of physical notions, as well as the development of reasoning and practical use of knowledge.

Teachers

This course has been created and is held by prof. Florina Stan and prof. Corina Dobrescu, graduates of the University of Bucharest – Faculty of Physics.

Suggestions for teachers

- ✓ Use classic oral assessments, such as debates or exercises.
- ✓ Use multiple answer type written assessments.
- ✓ Use active methods, such as discovery, exercise and proof by argumentation to build durable competences.
- ✓ Make observations on individual worksheets.
- ✓ Have students write essays, projects and portfolios.

- ✓ Include multimedia technologies in the teaching and learning processes.

3. Optional Course: **“The typology of physics exercises”**
   - ✓ Course duration: 1 year (1 class per week);
   - ✓ The course is aimed at 11th and 12th grade students;

Motivation

Physics exercises classes are vital to the development of rational thinking and understanding of the laws of nature.

The exercises selected for this course, classified by types, are:

- ✓ **Assignments** that are solved through reason, application of the laws and specific methods of physics (with the help of mathematics), graphic representation and interpretation of results.
- ✓ **An essential element of the teaching and learning processes** because it allows for a better, wider and more durable understanding of physical notions, as well as the development of reasoning and practical use of knowledge.

Teachers

This course has been created and is held by prof. Florina Stan and prof. Corina Dobrescu, graduates of the University of Bucharest – Faculty of Physics.

Suggestions for teachers

- ✓ Use classic oral assessments, such as debates or exercises.
- ✓ Use multiple answer type written assessments.
- ✓ Use active methods, such as discovery, exercise and proof by argumentation to build durable competences.
- ✓ Make observations on individual worksheets.
- ✓ Have students write essays, projects and portfolios.
- ✓ Include multimedia technologies in the teaching and learning processes.

Curricular Area- ICT

COURSE TITLE- Information Technology

School year 2009-2010

Target group: lower secondary school

Argument

The subject Information Technology for lower secondary school ensures the assimilation of computer usage knowledge and simple programming in the PASCAL programming language.

The development of student's skills in information technology usage has led to very good results, preparing them to fully benefit from the world of modern computers.

The study of this subject will be taking place in the IT laboratory, with the entire collective of students participating. Through individual computer work, the habit of working individually will be developing, while, at the same time they will be educated in the spirit of group activities.

Through taking this course, the lower secondary school student will be able to develop his exploring and problem-solving abilities, with the help of the computer. Meanwhile, the motivation and interest in the surrounding world, as a source of information, will increase, alongside with his cultural and intellectual empathy.

Target group The course aims at all students in lower secondary classes.

Motivation of the opportunity of the optional course

The course offers all pupils the possibility of being initiated in PASCAL/C++ programming, which forms an algorithmic, rigorous way of thinking and fundaments their preparation for all the subjects included in the curriculum, by approaching interdisciplinary issues.

Evaluating tools

- ✓ Evaluation exams
- ✓ Projects
- ✓ Portfolios

Venue IT laboratories **Number of classes** 2-4 classes a week

General objectives

1. Knowing and understading the concepts, the terms ad the notions specific to IT;
2. Developing the abilities to explore, investigate and use WINDOWS
3. Forming and developing the creative spirit together with forming and developing the ability to work both individually and in a team.
4. Generating the abilities to type correctly and fast
5. Developing the abilities to explore/investigate
6. Forming and developing the abilities to create simple algorithms
7. Generating and developing the abilities to type correctly and fast programs such as

PASCAL/C++;

8. Increasing interest in studying IT

Curricular area – ICT

Course title: Think.com

School year 2009- 2010

Target group: lower secondary school students

Target students
The course addresses the students in the 5th grade.

Opportunities provided by this optional course

This course gives pupils the possibility to design and construct a webpage and also to take part in cross curricular projects which shape their sense of good taste, create relationships between pupils from all around the country or from abroad and cement their knowledge in all the subjects covered in the school curriculum, by approaching them in a new, inter-disciplinary manner.

Types of evaluation:
- Test-papers
- Projects
- Portfolios

Venue:
The classes take place in the laboratory

Number of classes:
- 1-2 classes per week

Objectives

1. Knowing and understanding the terms, concepts and specific IT methods with which THINK.COM operates.
2. Developing the abilities to explre an investigate , using the instruments which THINK.COM has to offer, and conceiving their own website using the instruments and procedures allowed by THINK.COM.
3. Shaping the innovative and creative spirit, learning how to work individually and also taking part in a team.
4. Developing the communication skills using the specific language of IT

Contents
1. The Internet
   What is the Internet?
   Web page addresses
   What is a browser?

2. Accessing web pages
   - Keeping track of visited web pages
   - About bookmarks
3. Search Engines
   - Search engine examples
   - Using search engines for easier web page managing
4. E-mail
   - Services offered by e-mail
   - Managing e-mails : reading, composing, erasing e-mails, attaching files
5. Instruments for web page construction
   - Personal web pages
   - Interactive instruments
   - The teachers-parents-pupils community
6. The students' community
   - Instruments for searching and sending messages among the pupils-teaches virtual community
   - Managing your e-mail addresses
7. Useful instruments when starting a community project
   - Creating a project
   - Taking part in an international or national project in the THINK.COM environment
   - The international contest THINKQUEST
8. Launching projects accomplished by pupils and teachers

Values and attitudes

9. Knowing and using specific IT concepts
10. Shaping the capacity to utilize informatics instruments
11. Developing creativity when solving problems
12. Channeling the efforts in order to develop the creativity and innovation skills solicited by society
13. Making useful applications in various domains, merging IT knowledge with information from other disciplines
14. Developing the capacity to auto-evaluate the team's work and analyzing the final product
15. Stimulating initiative when working in a team, or individually
16. Diversifying the preoccupations in the IT offered services.
17.

Suggestions for teachers

The “Think.com” projects have a dominant practical side, but one should not forget that theory is also necessary. This is why the classes will take place in the laboratory, with each pupil at their own work station. For having a great class and for also accomplishing the objectives, please take into account the following suggestions:

- present the THINK.COM environment gradually
- give relevant examples for each new theoretical concept
- practice new elements with simple applications, then pass to a higher difficulty level
- the new concepts have to be presented in a logical way, with practical examples
- the evaluation items should be chosen according to the application worked on at a specific point in time
- for vast applications, use working in teams, where each member has specific tasks, suitable to their capacities
- it is useful to present previous projects and other applications, during class or during communication and essay sessions; this way, the experience of former pupils will be forwarded to the younger, and the pupils will be able to auto-evaluate themselves by seeing what else has been done. Teachers will be the ones coordinating this change of experience
- it is advisable to get the pupils used to working neatly, to fulfill the requirements of the beneficiary, to have well documented useful information, to test programs before presenting them, to treat their tasks responsibly.

Bibliography :

- Creating web-pages – Publishing house : L&S Soft; authors : Tudor Sorin and Vlad Hutanu
- ECDL courses – Publishing house : Casa, by Andreco; Author : Vasile Baltac
- Think.com course – Oracle Foundation

Curricular area-ICT

Course title: “Advanced languages of administrating data bases – PL/SQL”

12th grade

-2010-

This course covers the procedural extensive language SQL. Using an innovative method, based on projects, pupils learn procedural logical constructions using variables, constants, conditional instructions and iterative controls.

The pupils have the opportunity to sustain the second necessary exam for the Oracle Certified Associate.

Educational unit: SQL language elements

Pupils explore a part of the SQL limitations and learn why PL/SQL is necessary. Key words, definitions and optimal ways of utilization are introduced in PL/SQL.

Pupils learn the characteristics of the PL/SQL programming language; do comparisons between this and others like C and Java.

Pupils learn the bloc structures for PL/SQL. They start programming anonymous blocs in Oracle Application Express, a development environment based on web browsers.

PL/SQL descriptions

- the differentiation between SQL and PL/SQL
- the necessary explications for introducing the PL/SQL language
- the advantages of the PL/SQL utilization
- the analysis of the difference between PL/SQL and other programming languages

Creating PL/SQL blocs

- the identification of the different types of blocs PL/SQL
- the identification of the different programming environments PL/SQL
- the construction and execution of anonymous PL/SQL blocs
- output messages in PL/SQL

Creating a SQL basic instruction including ORDER BY

- the utilization of mathematical calculations
- the construction of a list of petitions using the alias of a column
- the application of the concatenation operator

- the utilization of the conditional functions which contain BETWEEB, IN and LIKE

The review of the SQL functions of the single row type

- CONCAT, SUBSTR and LENGTH functions utilization for manipulating character data
- rounding and reduction functions utilization for numeric data
- petition functions which contain null values selection and application

Education unit 2: Introductory notions of PI/SQL

This section introduces the syntax, the vocabulary and the lexical units of the programming language PL/SQL

Pupils learn to define variables for manipulating and adding data.

Pupils learn moreover about the data types which are supported by PL/SQL like integer, floating point, Boolean, dates, collections and LOB.

After a short review of the sql functions, the pupils learn how to incorporate the SQL functions in the PL/SQL language and about the necessity of the explicit conversion of the data types.

The utilization of the variables in PL/SQL:

- syntax identification for the PL/SQL variables
- variable declaration and initialization in PL/SQL
- valor change for variables in PL/SQL

Lexical units' recognition in PL/SQL:

- listing and defining of different types of lexical units in PL/SQL
- describing and determining the valid identificators
- describing and identifying the reserved words, the delimitations, of the literalizes and of the comments in PL/SQL

Recognition of the data types:

- defining the data types and explaining the necessity of their introduction
- listing and describing of the data types categories
- exemplificating the LOB scalar, composite and large

Utilization of the scalar data types:

- scalar data types declaration and utilization in PL/SQL
- defining some alleviating concepts for declaration and initialization in PL/SQL
- identification of the benefits of anchoring the data types with the %TYPE attribute

Review of the SQL-Joins section:

- construction and execution of the SELECT instructions to access more than one table using equijoin option

- construction and execution of the SELECT instructions to access more than one table using nonequijoin option
- construction and execution of the SELECT instructions to access more than one table using outer join option
- construction and execution of the SELECT instructions which give a Cartesian result

Revision of the group functions and of the SQL sub petitions:

- construction and execution of a SQL petition which uses group type functions for identifying a total sum, a medium valor and a maxim one.
- construction and execution of a SQL petition which gets along data bases on specified criteria.
- construction and execution of a SQL petition which contains the WHERE clause, using a sub-petition of a single row type
- construction and execution of a SQL petition which contains the WHERE clause, using a sub-petition of a multi-row type

Educational Unit 3: Sliders

Introduction about explicit sliders:

- explicit and implicit sliders
- utilization of a explicit cursor PL/SQL code
- listing two or more models for declaring and controlling explicit cursors
- Creating a PL/SQL code which initializes the pointer and inserts data into a variable
- Implementing a simple cycle which processes more rows from a pointer
- Creating a PL/SQL code which closes the pointer after processing the data from a variable
- Using the attributes of explicit pointers:
- Defining the registering structure using the %ROWTYPE attribute
- Creating a PL/SQL code for processing the row of an active set using the types of registering from the pointers
- Processing information about the status of an explicit pointer using the pointer attributes
- The FOR cycle:
- Explaining the advantages of the FOR cycle
- Creating a PL/SQL code for declaring a pointer and manipulating it in a FOR cycle
- Creating a PL/SQL code which includes the FOR cycle
- Pointer with parameters:
- Determining the advantages of pointers with parameters

- Creating a PL/SQL code for declaring and manipulating a pointer with parameters
- Using pointers for updating:
- Creating a PL/SQL code which blocks the rows using an appropriate function
- Tracking the effect of the NOWAIT function for updating a pointer
- Creating a PL/SQL code which uses the current row into an UPDATE or DELETE statement
- Using several pointers:
- The necessity of using several pointers for reports
- Creating a PL/SQL code which declares and manipulates several pointers in self-induced cycles(one cycle contains another)
- Creating a PL/SQL code for declaring and manipulating several pointers using parameters

Educational unit 4: Debugging

Up to this part of the course, the code written by the students works correctly as long as it is correctly compiled. However, when the compiled programs are executed, the code may cause unexpected errors. These errors are labeled as exceptions.

In this teaching unit, the students learn how to edit a function which manages exceptions such that the program halts when a PL/SQL exception is encountered. These functions make the program stronger by specifying the final actions before closing the command block.

Students learn how to use the Oracle Server and the exceptions defined by the user. Students review the role of the variables and use this information to realize the effects of subprogram exceptions.

Exception management

- Presenting the advantages of including exceptions in the PL/SQL code
- Characterizing the purpose of an EXCEPTION section in a PL/SQL block.
- Creating a PL/SQL code which includes an EXCEPTION section
- Printing guides for managing exceptions

Exception determination in the Oracle server

- Providing and detailing an example of an error defined by the Oracle server
- Providing and detailing an example of an error defined by the PL/SQL programmer.
- Distinguishing errors managed explicitly and implicitly by the Oracle server

- Creating a PL/SQL code which finds an error predefined in the Oracle server
- Creating a PL/SQL code which finds an error not predefined in the Oracle server
- Cresting a PL/SQL code which distinguishes an exception from en error code or from an error message

Finding user-defined exceptions

- Creating a PL/SQL code which designates a user-defined error
- Creating a PL/SQL code which creates an exception
- Creating a PL/SQL code which manages an exception
- Creating a PL/SQL code which uses the RAISE_APPLICATION_ERROR function

Realizing variables' use

- Detailing the rules for the domain of a variable when the variable is included to a block
- Distinguishing a domain error from a variable, when the variable is being used in a block
- Detailing the domain of an exception
- Distinguishing an exception domain error when the error is in a block
- Detailing the effect of exception spanning in a block

Educational unit 5: Procedures

Problems focused on performing certain tasks and functions may be modularized in procedures, PL/SQL blocks which are generally used to perform actions. Procedures –which always have a label- may be heaped in the database and can be accessed when repeated actions are necessary.

In this section the students create, identify and correct procedure errors. They learn how to use simple parameters for inserting information in a procedure. Students also learn how the PL/SQL procedures behave under several parametric modes which allow the parameters not only to introduce data into a procedure, but also to return the information by calling the PL/SQL block/

Finally, the students learn how to delete procedures and index them in a dictionary.

Creating procedures

- The differences between anonymous blocks and subprograms
- Identifying the advantages of subprograms
- Defining procedures
- Detailing the ways of calling a registered procedure
- Printing the steps in creating a procedure

Using parameters in procedures

- Detailing the manner in which a parameter contributes to a procedure
- Defining a parameter
- Creating a procedure using a parameter
- Accessing a procedure with parameters

Transitory parameters

- Printing the parameter types.

Advanced languages for database management – ORACLE 9i: SQL

Rationale

In the information age, high school students need to know the changes from the IT field and the way in which they influence society's evolution.Many of these changes have to deal with the organizing and depositing from the real world

A data base is a way to keep this information and to structure it so as to be useful.During this course students will be taught to find the way in which the events will be settled together from a research into a data base and to make interrogations using the PL/SQL language.At the end of this course ,students will know how to do different applications in which they can manifest their imagination,and their creative spirit.These applications wlii be part of complex projects which trains students' teams.

Over the length of this course, the students are taught to think the way in which the events of a case study are set together in a relational database and to make queries using the SQL language. Students, after completing this course will be able to create various applications by which they can manifest their imagination, initiative and creative spirit. These applications will be part of more complex projects that bring together teams of students.

The course has a large span from a conceptual point of view and, by this way; students are encouraged to identify informational connections and the keys for solving complex situations in the work scene. For students that wish to pursue a carrier in marketing, economical studies, information technology, commercial activities, modelling data forms the basis for identifying key information necessary in such an activity and for developing knowledge in any

direction of study. Students learn how to transform information from the work scenario to Entity Association Diagrams and, later, in a relational DB. Thus, they will have the opportunity to use the Marvel Project which represents special software created for them by the Oracle Internet Academy where SQL commands can be applied.
Students have the opportunity to take the second exam necessary for being certified with the Oracle Certified Associate.

Reference compentences:

- Developing the data modelling capacity by identifying key information necessary for building the Entity – Association system.
- Developing the capacity to refine the Entity – Association diagram attached to the work scene.
- Developing the capacity to turn an Entity – Association model into a relational DB.
- Developing the capacity to use the data manipulation language using Oracle 9i: SQL commands.
- Developing the capacity to use the commands of the Oracle 9i: SQL data definition language, to create DB objects and to control user access.
- Developing skills with the use of Oracle Project Marvel work system.

Specific components	**Content**
	Accessing more then one table by using the outer join option. • Constructing and using the SELECT instruction which give a Cartesian produce like. • Constructing and using of a SQL demand, which uses group like functions for identifying a total sum, a minimum value and a maximum value. • Constructing and using a SQL demand which groups data bases on scientific criteria. • Constructing and executing a demand which contains the WHERE clause by using a one row sub demand. • Constructing and using a demand which contains the WHERE clause by using a sub demand of multiple rows.

Modalities of defining and using the cursors	**Cursors** Introduction of the explicit cursors: • Explicit and implicit cursors • Use of an explicit cursor in the PL/SQL code • Listing of two ore more models for declaring and controlling the explicit cursors • Creating the code for PL/SQL which opens an cursor and puts a value in a variable • Use of a simple cycle which overtakes more then one row from a cursor Writing the PL/SQL which closes a cursor after overtaking the data in a variable. Using the attributes of the usual cursors: • Defying the registered structured using the attribute %ROWTYPE • Writing the PL/SQL code for processing the row set active using the types of register in the cursors • Overtaking the information about an explicit cursor by using the cursors attributes Cycle FOR: • The explanation of the advantages of the us of the For cycle • Writing the code in PL/SQL for declaring a cursor and manipulating it in the FOR cycle. • Writing of a PL/SQL code which contains a FOR cycle Cursors with parameters: • Finding out the benefits of using the cursors with parameters

	Writing the PL/SQL code for declaring and manipulating a cursor with parameter Using the cursors for actualization: • Writing the PL/SQL code for blocking the rows by using a right function • Following the effects of the NOWAIT function for the cursor • Writing the PL/SQL code for using the current row in a

Specific components	**Content**
	declaring update or Delete Use of two ore more cursors • The necessity of using more cursors for producing reports • Writing the PL/SQL code for declaring and manipulating cursors in cycles including one in to another • Writing PL/SQL code for declaring and manipulating more cursors using parameters.
Editing functions which manage exceptions so that the program stops when it riches a PL/SQL exception. This function makes the program more robust, specifying the finale actions before finishing the bloc of	**Error correction** Managing the exceptions: • Describing the advantages of including the exceptions in the PL/SQL code • Describing the purpose of a EXCEPTION section in a PL/SQL bloke • Creating a PL/SQL code for including a EXCEPTION section Finding the exception in the Oracle server: • Describing and giving an example of an defined error of the Oracle server • Describing and giving an example of an error defined by the PL/SQL programmer • Distinction between the errors managed explicit and implicit by the Oracle server • Creating a PL/SQL code for finding a predefined

actions. Using the Oracle server and the exception defined by the operator. Knowing the effects of the variables and using them to recognize the effects of the exceptions which find themselves in subprograms.	error found on the oracle server • Creating a PL/SQL code for finding a undefined error of the Oracle server • Creating a PL/SQL code that identifies an exception of an error code or an error message Finding the user defined exceptions: • Creating a PL/SQL code for naming an error defined by the user • Creating a PL/SQL code for creating an exception • Creating a PL/SQL code for managing an exception • Creating a PL/SQL code for using the function RAIS_APPLICATION_ERROR Recognizing the purpose of the variables: • Describing the rules for the domain of a variable when it is in a bloke • Recognizing a domain error of a variable when it is part of a bloc • Describing the domain of an exception • Recognizing an error in the domain of an exception when the error is part of a bloke • Describing the effect of exception spreading in blokes

Specific components	Contents
Creating, identifying and correcting procedure errors. Using simple parameters for introducing information into procedures. Using PL/SQL procedures that support many modes of parameters that not only	**Procedures** Creating procedures • Differences between anonymous blocks and subprograms. • Discovering the benefits of using subprograms • Defining procedures. • Describing the ways of calling a procedure that is already written. • Setting up the steps in creating a procedure Using parameters in procedures • Describing the way that a parameter contributes to a procedure.

introduce information into the procedure but gets it back using the PL/SQL block. **Deleting the procedures and visualizing them in the data dictionary.**	• Defining a parameter. • Creating a procedure that uses a parameter. • Accessing a procedure with parameters. Variables • Enumerating parameter types. • Creating a procedure that uses variables • Identifying methods of using variables • Describing the DEFAULT option for parameters. **Functions** Creating functions • Defining a registered function • Creating a PL/SQL block that contains a function • Describing the ways of calling a function. • Creating a PL/SQL block that calls a parameter function • The steps of creating a function • Describing the differences between procedures and functions Using functions in SQL declarations • The advantages of user created functions in SQL declarations • Describing when can the user created functions can be called from a SQL declaration • The restrictions in calling functions from SQL declarations Reviewing the data dictionary • The uses of a data dictionary • The differences between the 3 types of viewing a data dictionary. • Writing the SQL SELECT declarations for retrieving information from the data dictionary. • Explaining the use of the DICTIONARY function like a search engine in the data dictionary.

	Administrating the procedures and functions • Describing the exceptions • Deleting a function/procedure • Using the data dictionary to identify and administrate the registered programs Listing the object privileges • Listing many privileges for an object • Explaining the EXECUTE function • Writing the SQL declaration for giving/taking privileges for an object.

III.Values and attitudes

1. Developing the creativity and the imagination in solving problems.
2. Concentrating the progress efforts in developing programming abilities requested by the modern society.
3. Using the Oracle Application Express system to create software for many domains of activity combining the programming knowledge with other disciplines knowledge.
4. Developing the evaluation capacities trough team work and analyzing past work.
5. Stimulating initiative and developing interest in the IT services domain.

IV. Methodology suggestions

The course has a wide area conceptually speaking so the students are encouraged to identify informational connections and keys for solving complex situations in studying different cases.

“PL/SQL” language engages the students in designing activities for developing essential professional knowledge encouraging team work and exposing projects. Behind this purpose, the curriculum manages to involve students in activities that will help them grow in different cultural domains of the world.

PL/SQL is a course built to teach students how to communicate with a relational database, how to organize and conduct data using the database language. The PL/SQL commands are used for creating tables, updating, and extracting, modifying, deleting and organizing data from the database using the specific elements of the PL/SQL.

For the good development of the classes and for achieving the competences wanted, the following procedures will be followed:

- Creating individual work accounts for the students in the educational system Oracle Internet Academy where study materials that follow the

set up curriculum can be found, along with on-line end-chapter tests to verify what the students have learned so far;
- Presenting projects and other applications starting from the level of the students group to Reports and Papers Session
- Creating portfolios that will contain the projects that follow the "Language PL/SQL" relaying on different research and scripts created with Oracle Application Express

Bibliography

- ***Data Modeling and Relation Data Base Design,*** Vol I. Instructor Guide, Oracle University, iulie 2001
- ***Introduction to Oracle 9i : SQL*** Vol I, II.Instructor Guide, Oracle University, iulie 2001
- ***Introduction to Oracle 8i : SQL –*** Oracle

PL/SQL – Oracle, Vol I, II.Instructor Guide, Oracle University, iulie 2007

THE DEVELOPMENT OF DIDACTIC EDUCATIONAL IT TOOLS FOR THE TEACHING OF SCIENCES

Period of the course: two years (1h/week), 10th and 11th grade

Nomination of the class/group: The Course is addressed to students who wish to participate in the development of lessons or didactic moments in computer assisted lessons from the curricular area of mathematics and sciences. It is an integrated optional course for many curricular areas.
Motivation of the opportunity of the optional course: It offers the teachers and the students the possibility to put forward the didactic experience and the knowledge in the IT area through the development of educational software. For assimilating the new technologies, for using them efficiently, for increasing the access to digital educational resources and for creating new virtual means of learning, the course proposes to train the students in the development of IT products that constitute IT instruments of teaching.
Motivation of the capacity to hold the course: The course is held by three titular teachers : Silvia Moraru – chemistry teacher, Ioana Stoica – physics teacher, Rodica Cherciu – computer science teacher. The didactic and pedagogical experience of the three teachers in the development of educational software, their participation in numerous national and international symposiums concerning this subject, with the presentation of interesting educational software,

acknowledged by OSIM and having won multiple awards, assert the professionalism and the indisputable success of the course.

Objectives:

- Forming and developing the skills of using modern means of communication, using new technologies, in the context of the need to form a “digital culture”, as an essential element of the minimal qualifications of students;
- Using software applications specialized for the development of educational soft: FLASH;
- Identifying the connections between computer sciences, physics and chemistry;
- Planning scenarios and building didactic stages to explain phenomena, processes, procedures.
- Modeling physical and chemical phenomena, as well as making experiments in virtual laboratories which permit a better understanding in case the experiments cannot be analyzed in the school’s real laboratories.
- Processing experimental data, data obtained from observations or through experiments, which can be processed according to the proposed goal, by using adequate computer programs.

Chapter 6

The objectives of the ICT implementation strategy at “Tudor Vianu” National High school of Information Technology

Student centered teaching – an essential objective in making a performing educational system

The specialized literature, the experience gained during the design and the implementation of interactive lessons places the student in the centre of the teaching – examination process.

What is student-centered education?

The pupil is encouraged to create, understand and connect all of his/her newly acquired knowledge. (McCombs and Whistler 1997). Students will be more motivated to learn when they have direct contact with international content. Pupils won’t learn information by heart, instead they’ll understand and practise anything they learn as ‘co-creators’ in the teaching – examination process (McCombs and Whistler 1997).

What are the benefits of student-centered education?

The student doesn’t directly receive raw information; instead he experiences it through didactic activities created by the teacher. The pupil is implicated in the process with his own efforts. The “student-centered teaching” is the attribute for success in the student-teacher team (North Central regional Laboratory 2000)

How do we create student-centered teaching?

The teacher leads the teaching-examination process, designs the layout of the lesson thus helping the student to ‘learn how to learn’.

What are the steps needed to accomplish this kind of lessons?

The teaching-examination process needs to be accomplished by the student-teacher team, needs to be active and each didactic activity needs to be authentic, specific and oriented towards applications that will attract the student.

If applied to exact sciences, the student-centered teaching has pointed out the usage of teacher designed “lessons plans”, depending on the type of lessons. The didactic strategy consists in teaching the subject in a logical way so that the student is “guided” through heuristic conversation by the teacher. The questions address the whole class and the students, alone or in groups, search for the answer (this is the road towards teaching and applying the “student-centered lesson” model).

Modern teaching puts the student in the center of the educational process that is designed, applied and analyzed by the teacher.

Self-evaluation will determine the teacher to choose the best strategy for the future, depending on each class, group or student’s capabilities. The modern didactic designing will stimulate the student-teacher team to efficiently solve the

work tasks creatively. Therefore, during the “Oxygen” lesson that takes place in the 8th grade the pupils could rigorously understand the physical and chemical phenomena they encounter during direct or virtual lessons, depending on the location where the lesson takes place.

The precision with which the teacher sets the operational objectives of the lesson, designs the didactic activities (teacher – student) and interprets the feed-back, will influence the “success” of the lack of “success” of the lessons. In comparison, the ‘traditional’ lesson about “Oxygen” had a success rate of 60%, while the “modern lesson” that determines the student to continuously work for 50 minutes had a spectacular result.

Applying modern didactic strategy , by using the AEL platform, “the didactic project “ – THE OXYGEN – makes the pupil capable of communication and permanent collaboration, helps him to consolidate his knowledge by formulating questions or answering the open questions he is asked .

By dealing with the practical activities, explaining the electrolysis phenomenon, the way of obtaining the hydrogen and oxygen from the electrolysis of water, refreshing the knowledge achieved in physics and chemistry, virtually simulating a physical-chemical phenomenon (the electrolysis of bubbly water), outlining all the chemical properties of the oxygen lead to a full participation of the student in the team he works in.

The groups of students, coordinated by teachers, know that during the continuous evaluation (7 minutes), placed at the end of the class, they will obtain spectacular results and so the operational objectives settled by the teacher would be accomplished 99-100%.

These are described in details in the “Oxygen” Didactic Project. The described lesson is based on an extremely well known didactic method, but which has a very poor level of usage and that is “I know – I want to know – what have I learned?”

On the way through the didactic project described above, it is easy to notice:

- The “teacher – students” team is strong and provided with a high level of communication
- The scientific content is carefully selected, is presented in a suggestive way, by making the pupil take part in the rediscovery of every new element of content

  The elements of the virtual simulation (the electrolysis of the water, the burning

of non-metal substances in oxygen, the oxygen circuit in nature), interactively displayed, transform the student into a “full participant” in the teaching – learning – evaluating process.

By the end of the lesson, both the student and the teacher will have known:

- We know/we used to think we know
- What we want to know
- What have we learned

These gaps are filled in by each and every student and this will lead the “teacher – pupils team” to imagine easier the following step.

Throughout the lesson, the persistent interactivity (educational software to student, student to students, student to teacher) will stimulate the pupil for: his imagination (finding real solutions to the presented problems), his level of applying the studied aspects, the development of his possibility to work efficiently, during a certain time limit with a maximum efficiency in the team.

The interdisciplinary study of the thermodynamics – the laws of the ideal gas – studied in chemistry in the 9^{th} grade and in physics in the 10^{th} grade, has highlighted, by using the ICT methods, the necessity of preparing the teachers in the TIC area.

The ability of using ICT, as shown in the Strategy of Lisbon, is seen as a new form of “digital education”, which, together with the classic forms, helps everyone to participate in the society of information. The teacher has the role of selecting the digital resources of learning. Therefore, depending on the pupils, he/she can use:

- AEL Laboratory – virtual platform – a closed system available for every school and high school from Romania
- Informative materials created by the teacher
- Digital didactic methods from high-level universities around the world

This way, the present study provides a comparison regarding the use of these learning methods, dedicated to “The laws of the ideal gas”.

The utilization of the AEL virtual platform in the study of the laws of ideal gas has turned to good account:

- A run through scientific notions concerning the isothermal, isobaric and isocore transformations of an ideal gas
- The student, helped by the teacher, will have a run (according to the didactic project elaborated by the teacher) through the virtual didactic activities involved in the making of the virtual experiments, so as, for each and every transformation, the team, consisting of 2-4 pupils, would be able to deduce the laws of the ideal gas (the law of the isothermal transformation T-constant, the law of the isobaric transformation P-constant, the law of the isocore transformation V-constant)
- The way of learning is chosen by the group of students under the guidance of the teacher. Hence, the didactic activities proposed in the

worksheet determine pupils to understand the studied notions, to update the notions studied in physics and chemistry, to put into operation the deduced laws on certain issues.

- The exercises and the applications contained by these methods of study will enable the student to understand the necessity of being aware of these scientific notions (applications in the real life, applications in the industry), leading to the development of his creativity.
- The teacher has the role of coordinating every didactic activity proposed, is active and creative. Thus, he can introduce activities in order to stimulate the children's imagination, making them consider a lesson as a "quest" for knowing the real world and for improving its quality. In the traditionally built lesson, all the student does is to study the laboratory experiments (the transformations of the ideal gas), without having the chance to concretely complete the experimental determinations in a limited time (a class lasts no more than 50 minutes).
- By adapting the informational support to the operational objectives of the lesson, the "teacher – student team" will obtain an outstanding efficiency. The feed-back will emphasize student's ability to apply and operate with the studied notions.
- The study compares and contrasts the results obtained in the continuous evaluations of a "traditional lesson" and those of a lesson in which the ICT methods are used, by focusing on the following issues:
    1. the amount of reservation of the scientific concepts
    2. the amount of applicability of the studied notions
    3. students' ability to explain the natural phenomena based on the studied laws
    4. students' ability to create and solve and proposed exercises
    5. the results obtained in the summative evaluations
    6. students' ability to take part in the improvement of the utilized ICT didactic methods

"TRADITIONAL" LESSON (THE STUDY OF THE IDEAL GAS)	ASPECT	"MODERN" LESSON (THE STUDY OF THE IDEAL GAS)
40%	a	80%
35%	b	80%
40%	c	80%
50%	d	90%
grades > 900 40%	e	Grades>900 90%
-	f	1-2 students propose solutions

NATIONAL COLLEGE OF COMPUTER SCIENCE “TUDOR VIANU”
EDUCATIONAL PROJECT

The use of new IT technologies in teaching chemistry

- **SUBJECT: CHEMISTRY**
- **8TH GRADE**
- **TEACHER: SILVIA MORARU**
- **CONTENTS: OXYGEN – 2 CLASSES**
- **LESSON TYPE: ACQUIRING NEW KNOWLEDGE**
- **LOCATION: CHEMISTRY LABORATORY: 1 CLASS**
  AEL LABORATORY: 1 CLASS

REFERENCE OBJECTIVES

At the end of this lesson, the student will be able:

- to use specific terminology and scientific conventions regarding simple substances (oxygen)
- to conduct experimental laboratory operations in order to study the properties of oxygen
- to group and represent the observations / experimental data obtained after having studied the properties of simple substances (oxygen)
- to apply principles / rules in the study of the properties of certain class compounds
- to identify polluting agents of the surrounding environment
- to evaluate risk factors involved in the use of certain chemical substances and to decide on the advantages and disadvantages of their use

OPERATIONAL OBJECTIVES

At the end of this lesson, the student will be able:

O1 to explain chemical and electrochemical character of oxygen on account of its
structure;

O2 to identify chemical compounds that contain oxygen ;

O3 to write the equations of chemical reactions that bring about obtaining oxygen in
nature and in the laboratory ;

O4 to explain the chemical behavior towards metals and nonmetals;

O5 to do chemical calculations regarding the equations of chemical reactions;

O6 to explain the technical applications of oxygen.

ACTIVITIES UNFOLDING

- the completion of the educational project
- the organization and preparation of the class
- the announcement of the subject
- the announcement of the objectives to be accomplished
- the preparation of the self – evaluating test (the students will be able to access the answers)
- the preparation of the homework chart.

RESOURCES

- Multimedia Support (computer, video projector, screen)
- Educational Software (chosen by the teacher)

EDUCATIONAL STRATEGIES

EDUCATIONAL METHODS

- dialogue
- explanation
- observation, explanation and analysis of certain computer experiments
- challenge
- the filling in of the work chart during the lesson

EDUCATIONAL SOURCES

- course book
- workbook
- work chart
- educational software

EDUCATIONAL EVENT	LEARNING ACTIVITIES		ACTIVITIES CONTENT	EVALUATION ITEMS 7 MINUTES
	Teacher Activity	Student Activity		
DRAWING ATTENTION	•Establish the lesson plan by defining the operational objectives and building educational activities regarding the accomplishment of operational objectives • The teacher elaborates a work chart and the test of continuous assessment (for feed-back)	The students answer the teacher's questions, refreshing their previous knowledge		
LEARNING GUIDANCE	The teacher directs learning in order to accomplish O1	Students solve the educational activities individually A1a ; A1b; A1c		
	O2	A2a ; A2b	M1_AEL M2_AEL	I 1 I2
	O3	A2a		
	O4	A2c	M3_AEL	I3
	O5	A2d		

RATING PERFORMANCE	Evaluates the answer and makes comments	Analyses the peers' answers and formulates critical remarks		
REALIZING TRANSFER (FEED-BACK)	Analyses the peers' answers and formulates critical remarks			
STUDENTS 'SELF-EVALUATION		Correcting errors and self-evaluation		
EVALUATION OF THE ANSWERS	Centralization of the evaluation test	correcting the possible errors (the solved test shown on the screen)		
GUIDING THE INDIVIDUAL ACTIVITIES	proposes the homework (work chart) proposes a project called "AIR" (teamwork , deadline : January 2007)	writes down teacher's requirements		

OXYGEN – WORK CHART

EDUCATIONAL ACTIVITY 1

a) Model the isotopes of oxygen :

indicates nr. pt = ?

nr. e- = ?

nr. no = ?

b) Explain the chemical and electrochemical character of oxygen

c) Explain how is a stable structure of oxygen realized.

EDUCATIONAL ACTIVITY 2

a) Fill in the gaps :

Air has the following composition .....O2.....N2, ...other gases;

b) Fill in the text :

water contains x%O and y%H;

Calcium oxide contains a%Ca şi b%O;

Sulfuric acid contains c%H; d%S; e%O;

Glucose is an organic compound having the formula C6H12O6, and the percentage formula : t%C; v%H; w%O

- **EDUCATIONAL ACTIVITIES 3**

a) Complete the equation of the chemical reaction:

$H_2O_2 \xrightarrow{MnO2}$

$KclO_3 \xrightarrow{t^oC}$

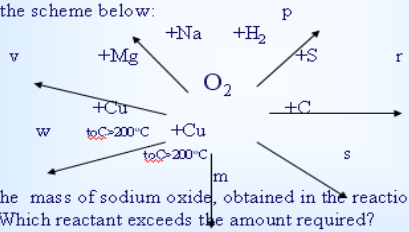
$HgO \xrightarrow{t^oC}$

b) Indicate the physical properties of the oxygen:

……

……

c) Complete the scheme below:



d) Calculate the mass of sodium oxide, obtained in the reaction of 2 mole O_2 with 0,5 mole Na. Which reactant exceeds the amount required?

e) Write down three technical applications of oxygen :

……

……

CONTINUOUS ASSESSMENT TEST (7 MIN)

- I) 2p. After heating 2450g potassium chlorate, you obtain oxygen. Calculate the number of obtained oxygen molecules. .
- II) 2p. NA molecules de oxygen react with 16g de S. Calculate the obtained mass of oxide .
- III) 5p. Complete the chemical processes below :

Mg + O2 → X

X + H2O → Y

PROBLEM SOLVING - EVALUATION TEST

2p. 1. $2KClO_3 \xrightarrow{t^oC} KCl + 3O_2$

2 mole $KClO_3$ ..... 3 mole O_2

20 mole $KClO_3$ ..... a

$a = 3 \cdot 20 / 2 = 30$ mole O_2

Nr. molecule $O_2 = 30 \cdot N_A = 30 \cdot 6{,}023 \cdot 10^{23}$ molecule $O2 = 18{,}069 \cdot 10^{24}$ molecule oxygen

2p. 2. $S + O_2 \longrightarrow SO_2$

1 mole atom S ..... 1 mol O_2

0,5 mole atom S x

$x = 0{,}5$ mole O_2 ⟶ O_2 is in excess

1 mole atom S ..... 1 mole SO_2

0,5 mole atom S ..... y

$y = 0{,}5$ mole S

$m_{SO_2} = 0{,}5 \cdot \mu_{SO_2} = 0{,}5 \cdot 64 = 31 g SO_2$

5p. $2Mg + O_2 \longrightarrow 2MgO$ magnesium oxide

$MgO + H_2O \longrightarrow Mg(OH)_2$ magnesium hydroxide

NATIONAL COLLEGE OF COMPUTER SCIENCE “TUDOR VIANU”
EDUCATIONAL PROJECT

The laws of ideal gas

DIDACTIC PROJECT

Subject: Chemistry 9th grade
Physics 10th grade

- Teacher: Silvia Moraru
- Topic :The laws of ideal gas
- Type of lesson: Acquiring new information and knowledge
- Takes place in the chemistry laboratory, physics laboratory, AEL, 2hours

REFERENCE OBJECTIVES

At the end of the lesson the student will be able to:

- To use the terminology and the scientific conventions regarding the ideal gas
- To lead experimental operations in the laboratory to study the isothermal process and isobaric process.
- To classify and represent the observation/data resulted after performing the experimental activities (real/virtual)
- To identify the cases of the transformation of the ideal gas in real life

OPERATIONAL OBJECTIVES

At the end of the lesson the student will be able to:
O1:explain and state the law of the isothermal process
O2: explain and state the law of the isobaric process
O3: explain and enunciate the law of the isocore process
O4:identify each case in which they should use each transformation (T=ct; P=ct; V=ct) and to solve the proposed problems
O5:to explain the technical applications of this transformation of the ideal gas
O6:to do the experimental activities real/virtual for the three transformations (T=ct;P=ct;V=ct;)

The development of the lesson:

- Accomplishing the didactic project
- Organising and preparing the class
- The announcement of the subject
- The announcement of the wanted effects
- Preparing the self-evaluating test
- Preparing the sheet which contains the homework Means
- The multimedia equipment(PC, Video projector ,screen)
- Educational software

DIDACTIC STRATEGIES

Didactic methods:

- Dialogue
- Explanations
- Problematization
- Observing,explaining and analysing the experiments (real/virtual)
- Completing the worksheet during the class

DIDACTIC MEANS

- The physics /chemistry book
- The notebooks
- The worksheet
- The educational software

Didactic Event	Activities		Subject of the activities	Evaluation Items -10 minutes
	Teacher's job	Pupils' job		
	Establishes the schedule of the lesson and builds didactic activities considering the accomplishment of the operational objectives	The student answers to the teacher's questions (having in mind previously acquired knowledge)		
	The teacher prepares the sheet and the test (for realizing the feed back)			
	The teacher leads to achieving the operational objectives O1	The students work individually the didactic activities on the sheet A1a,Aib,A1cA1d,A1e	M1 AEL M2 AEL	I 1
	O2	A2a,A2b	M3 AEL M9AEL	I 2
	O3	A3a,a3b,a3c	M11 AEL	
	O4	A4aA4b		I 3
	O5	A4d		

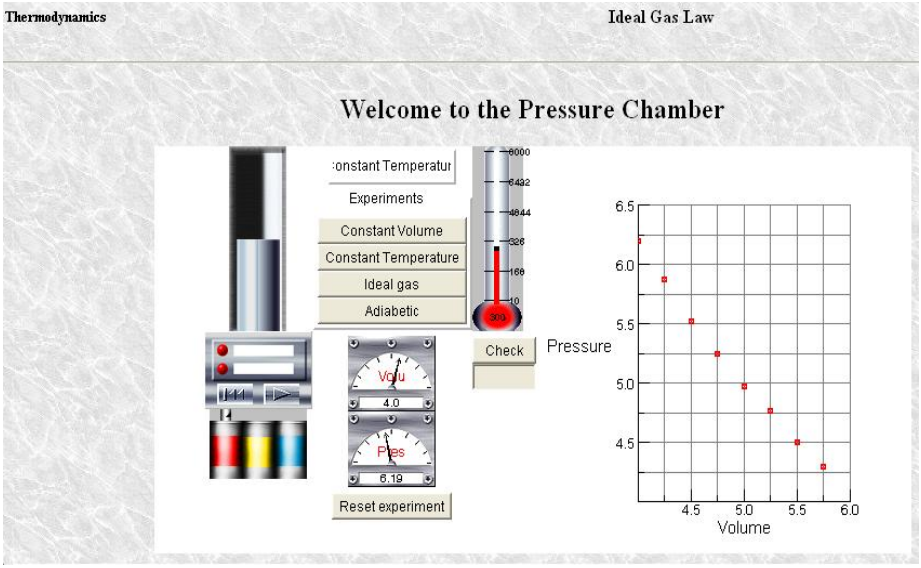
Measuring performance	Evaluate and comment the answers	Analyse the answers of their colleagues and argue about it		
Accomplishing the transfer	Propose for solving three items*checking two essential objectives)	Analyse the proposed problems and apply the acquired knowledge.		
Students' self-evaluation		Correct the mistakes and self-evaluation		
Evaluation of the answers	Focusing the results of the evaluation test	Correct the possible mistakes(the test solved and written on the screen)		
Leading the individual activities	Recommending the homework Recommending to work on a report with the title ::Industrial applications of the ideal gas”	Write the teacher's requirements		

For the **„Performance team”** using the most popular mean of communication „The internet” for studying this themes „THE LAWS OF THE IDEAL GAS” in the virtual lab.

The basis of this lesson presents:

- The features of the ideal gas
- The definition of pressure and the unit of measurement (IS and others)
- The AVOGADRO law
- The law of the ideal gas (establishing R)
- Applications concerning to find out the molecular mass

Presenting the transformation of the ideal gas



Experimental Instructions

In this series of experiments, you will control the action of a piston in a pressure chamber which is filled with an ideal gas. The gas is defined by four states:

- Temperature
- Volume or density
- Pressure
- Molecular Weight

There are 3 possible experiments to do. In the third experiment, labelled Ideal Gas Law, you can select from the Red, Blue or Yellow gas containers. Each gas in those containers has a different molecular weight and hence each will respond differently under changing pressure conditions.

Be sure that the pressure in the chamber never exceeds 10 atmospheres !!!

If the pressure exceed this amount, the chamber will crack and the gas will leak out and your experiment will be over. Even though this is virtual gas, its effects could be unpredictable.

Gas Laws

Gases behave differently from the other two commonly studied states of matter, solids and liquids, so we have different methods for treating and understanding how gases behave under certain conditions. Gases, unlike solids and liquids, have neither fixed volume nor shape. They are molded entirely by the container in which they are held. We have three variables by which we measure gases: pressure, volume, and temperature. Pressure is measured as force per area. The standard SI unit for pressure is the pascal (Pa). However atmospheres (atm) and several other units are commonly used. The table below shows the conversions between these units.

Units of Pressure	
1 pascal (Pa)	1 $N*m^{-2}$ = 1 $kg*m^{-1}*s^{-2}$
1 atmosphere (atm)	$1.01325*10^5$ Pa
1 atmosphere (atm)	760 torr
1 bar	10^5 Pa

Volume is related between all gases by **Avogadro's hypothesis**, which states: Equal volumes of gases at the same temperature and pressure contain equal numbers of molecules. From this, we derive the molar volume of a gas (volume/moles of gas). This value, at 1 atm, and 0° C is shown below.

$$\overline{V} = \frac{V}{n} = 22.4 \text{ L at } 0\,^{\circ}\text{C and } 1 \text{ atm}$$

Where:

V bar=molar volume, in liters, the volume that one mole of gas occupies under those conditions
V=volume in liters
n=moles of gas

An equation that chemists call the **Ideal Gas Law**, shown below, relates the volume, temperature, and pressure of a gas, considering the amount of gas present.

$$PV = nRT$$

Where:

P=pressure in atm
T=temperature in Kelvins
R is the *molar gas constant*, where R=0.082058 $L*atm*mol^{-1}*K^{-1}$.

The Ideal Gas Law assumes several factors about the molecules of gas. The volume of the molecules is considered negligible compared to the volume of the container in which they are held. We also assume that gas molecules move randomly, and collide in completely elastic collisions. Attractive and repulsive forces between the molecules are therefore considered negligible.

Example Problem: A gas exerts a pressure of 0.892 atm in a 5.00 L container at 15 degrees Celsius. The density of the gas is 1.22 g/L. What is the molecular weight of the gas?

Answer:
PV = nRT
T = 273 + 15 = 288
(0.892)(5.00) = n(.0821)(288)
n = 0.189 mol
$\frac{.189\ \text{mol}}{5.00\ \text{L}} \times \frac{x\ \text{grams}}{1\ \text{mol}} = 1.22\ \text{g/L}$
x = Molecular Weight = 32.3 g/mol

We can also use the Ideal Gas Law to quantitatively determine how changing the pressure, temperature, volume, and number of moles of substance affects the system. Because the gas constant, R, is the same for all gases in any situation, if you solve for R in the Ideal Gas Law and then set two Gas Laws equal to one another, you have the Combined Gas Law:

$$\frac{P_1V_1}{n_1T_1} = \frac{P_2V_2}{n_2T_2}$$

Where:

values with a subscript of "1" refer to initial conditions
values with a subscript of "2" refer to final conditions

If you know the initial conditions of a system and want to determine the new pressure after you increase the volume while keeping the numbers of moles and the temperature the same, plug in all of the values you know and then simply solve for the unknown value.

Example Problem: A 25.0 mL sample of gas is enclosed in a flask at 22 degrees Celsius. If the flask was placed in an ice bath at 0 degrees Celsius, what would the new gas volume be if the pressure is held constant?
Answer:
Because the pressure and the number of moles are held constant , we do not need to represent them in the equation because their values will cancel . So the combined gas law equation becomes :
$\frac{V_1}{T_1} = \frac{V_2}{T_2}$

$\frac{25.0\ \text{mL}}{295\ \text{K}} = \frac{V_2}{273\ \text{K}}$

$V_2 = 23.1\ \text{mL}$

We can apply the Ideal Gas Law to solve several problems. Thus far, we have considered only gases of one substance, pure gases. We also understand what happens when several substances are mixed in one container. According to Dalton's law of partial pressures, we know that the total pressure exerted on a container by several different gases, is equal to the sum of the pressures exerted on the container by each gas.

$$P_t = P_1 + P_2 + P_3 + ...$$

Where:

P_t=total pressure in atm
P_1=partial pressure, in atm, of gas "1"
P_2=partial pressure, in atm, of gas "2"
and so on

Using the Ideal Gas Law, and comparing the pressure of one gas to the total pressure, we solve for the mole fraction.

$$\frac{P_1}{P_t} = \frac{n_1RT/V}{n_tRT/V} = \frac{n_1}{n_t} = X_1$$

Where:

X_1=mole fraction of gas "1"

And discover that the partial pressure of each the gas in the mixture is equal to the total pressure multiplied by the mole fraction.

School progress must be understood as a possibility to put to very good use the growth of the confidence in ICT usage in education, generally or particularly, in scientific education, through realizing the future benefits of learning-teaching-evaluating resources management, access and storage.
ICT usage in didactic activity should be based upon a real support given to the teacher. It is necessary that in the school should exist a technical support – the virtual laboratory AEL, the “SMART” board, an internet connection and also the capacity of the teacher to use this technology.
Research has imposed a supplementary preparation of the teacher, the creation of necessary work-sheets, the organization of problem types. Hence, the students of the performance group (7 national school Olympiad participants from the 9th grade) have individually run through the informative material (in English), the work files (in Romanian) and the problems proposed in the mentioned site, but also those proposed by their teacher, during a working time of 2 hours.
Traditional didactics involve the student to a much smaller extent, without the feed-back realistically presenting the parameters aimed by the teacher. Meanwhile, modern didactics involve the student-teacher team in equal proportions, the teacher determining the learning conditions, taking into account the collective of students.

ICT INTEGRATION IN THE CURRICULAR AREA OF SCIENCE

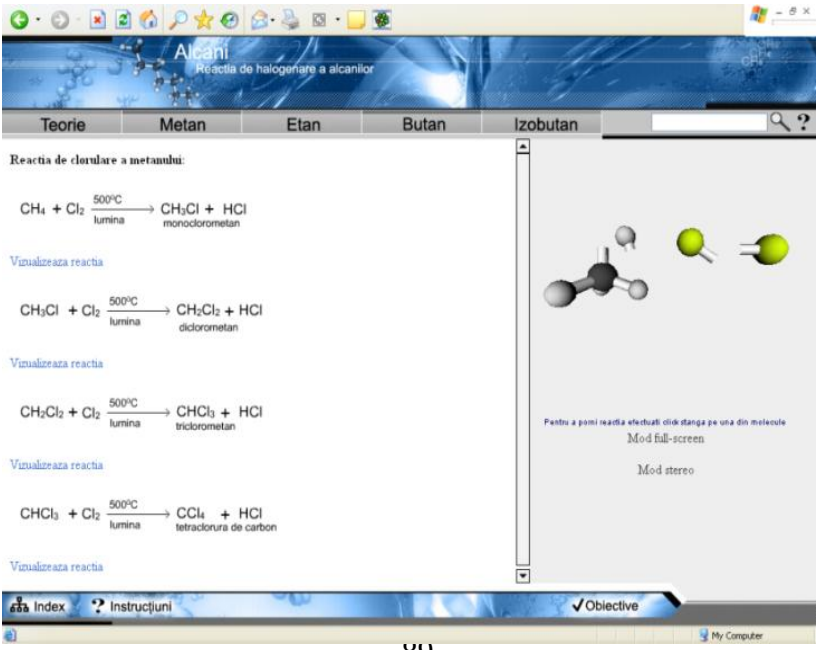
The development of the virtual platform “DIDACTICVIP” http://didacticvip.lbi.ro by the teachers of the Science curricular area has underlined the necessity of implementation of new technologies in scientific education. The virtual platform contains: didactic projects at chemistry, physics, mathematics and informatics.
The collaboration of the Science curricular area teachers is materialized in this virtual platform, which can be utilized by any teacher. The methodical-scientific rigor, the high degree of applicability, the proposed modern didactic methods, the accuracy of the operational objectives, the proposed didactic activities, so the Teacher – Pupil team fulfills the purpose of the lesson, which is centered on the student: his capacity of knowing, at the end of the lesson, how to operate with the studied notions. The realization of a modern modality of implementing ICT in the scientific education has led to the modernization of the process of teaching-learning-evaluating.
The digital physics, chemistry, informatics lessons that are presented underline the openness of the school to the outside world (on-line classes) and the efficient use of resources.
From the conclusions of our practical experience, the following are notable:

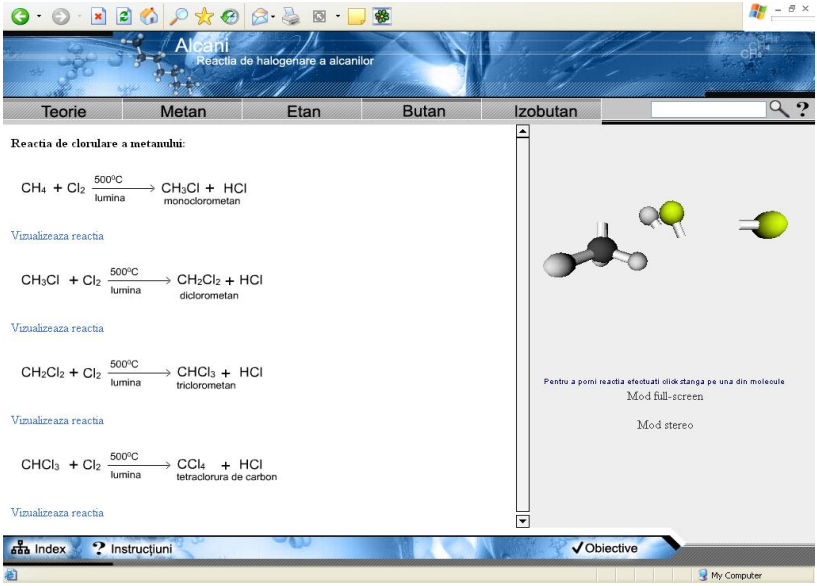
- the necessity of extending our work in mixed teams : teachers-pupils;
- the development of a creative, innovative character of the lesson, the scientific rigor of the notions presented
- the continuous realization of a critical evaluation which should lead to self-adjusting our own lessons!
- the necessity of permanent education
- the realization of an “open learning centre”, to facilitate the participation to the teaching-learning-evaluating process.

The Educational Offer of “Tudor Vianu” National High school of Information Technology contains the examples of good practice of teachers: Silvia Moraru, Rodica Cherciu, Corina Dobrescu, Florina Stan, regarding ICT usage in their lessons. The multimedia products presented at “Hands on Science” Conference (2004 – Slovenia): physics, chemistry, informatics; The National Conference of Virtual Education (2004 – Faculty of Mathematics, Bucharest): physics, chemistry, informatics; The International Symposium: Chemistry – friend or enemy – chemistry, 2007, Bucharest.

The following sequences underline aspects of the course support of a chemistry lesson – **Alkans**– three physics lessons – **Energy and power of electric current, Electromagnetic Force, Mechanical Oscillations** – one informatics lesson: **Backtracking**.

- **Alkans – Prof. Silvia Moraru**




Alcani
Reactia de halogenare a alcanilor
Teorie
Metan
Etan
Butan
Izobutan
Reactia de clorulare a metanului:
CH4 + Cl2 500°C lumina → CH3Cl + HCl monoclorometan
Vizualizeaza reactia
CH3Cl + Cl2 500°C lumina → CH2Cl2 + HCl diclorometan
Vizualizeaza reactia
CH2Cl2 + Cl2 500°C lumina → CHCl3 + HCl triclorometan
Vizualizeaza reactia
CHCl3 + Cl2 500°C lumina → CCl4 + HCl tetraclorura de carbon
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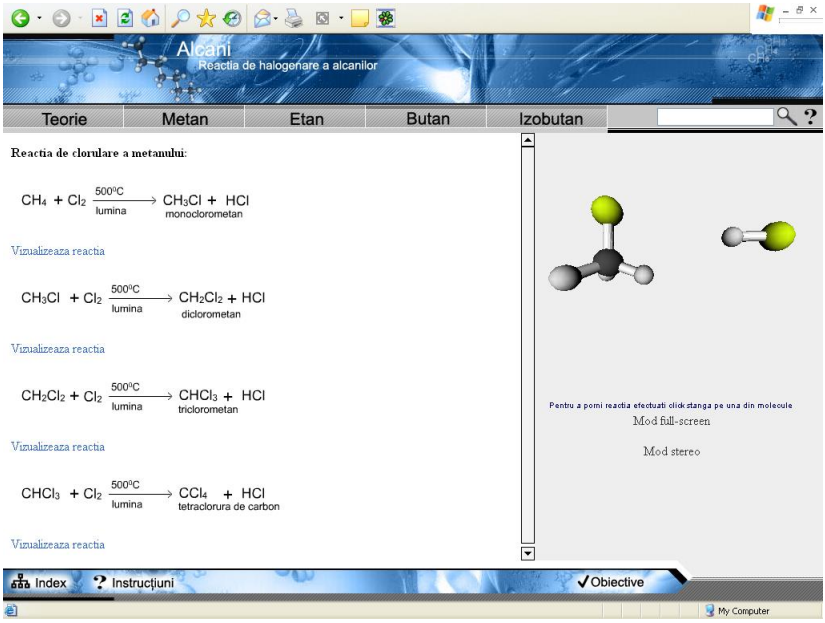
Alcani
Reactia de halogenare a alcanilor
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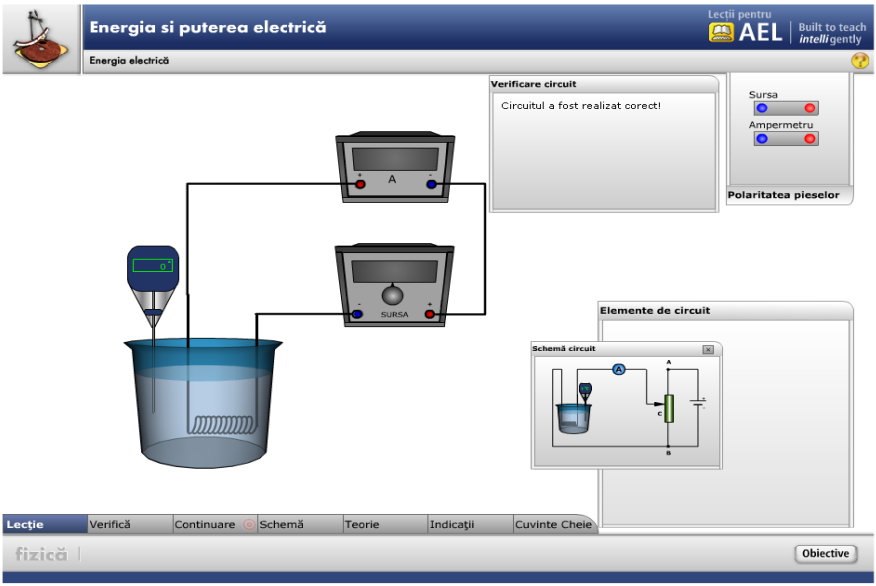
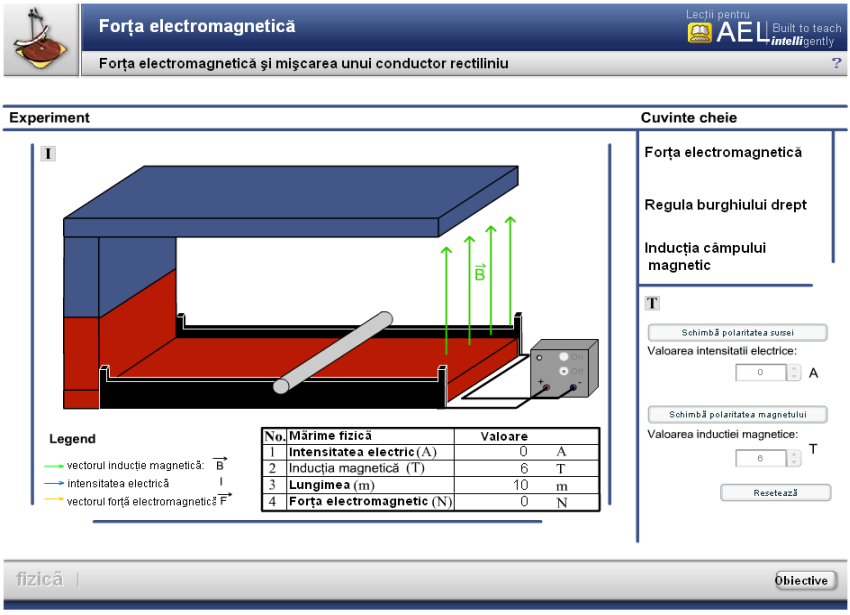
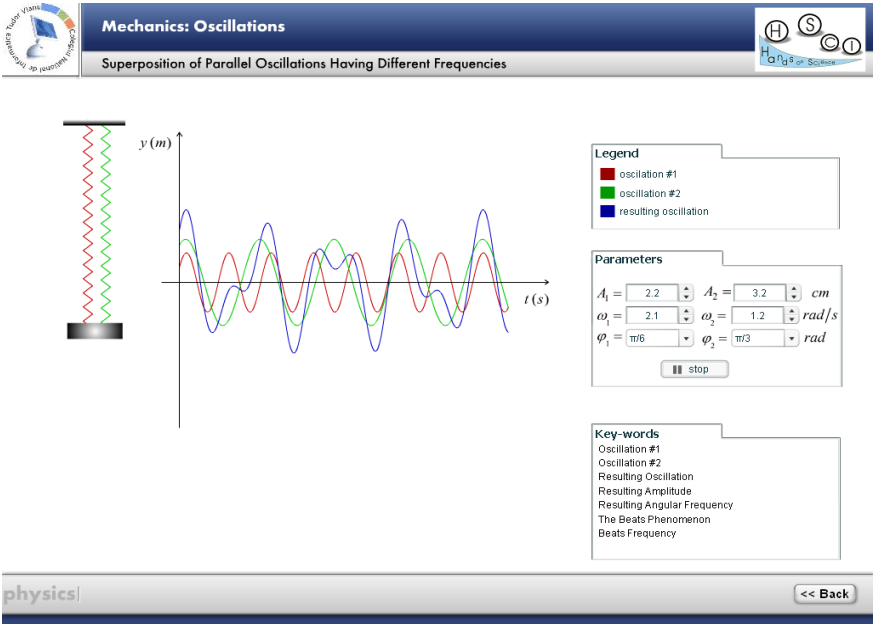
- **Energy and the power of elctric current – Prof. Stan Florina**



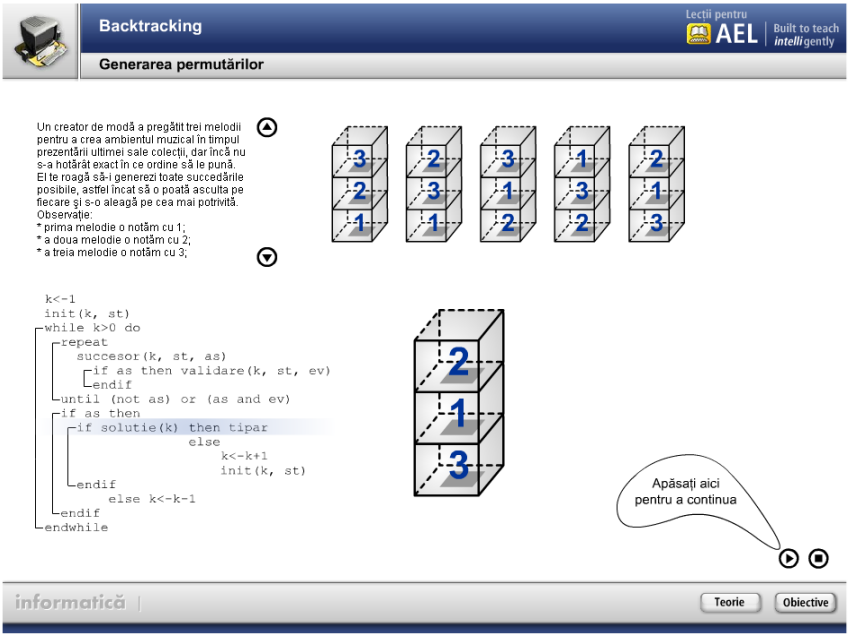
- **Electomagnetic force – Prof. Corina Dobrescu**



• Mecanical Oscillations – Prof. Stoica Ioana



•Backtracking – Prof. Rodica Cherciu



ICT'S IMPACT ON LEARNING RESULTS THE EDUCATIONAL EVALUATION AND THE EVALUATION OF PERFORMANCES

The education reform became present in the "Tudor Vianu" National High school of Information Technology through a series of measurements concerning the modernization of the curriculum and the development of the curriculum according to the school's decision (CDS), and the development of the techniques of teaching-learning-evaluating.

Briefly, here is what you need to know when you apply for the "Tudor Vianu" National High school of Information Technology:

- The education system is undergoing changes, evaluation and assessment complying with various tendencies, guidelines and decisions in modern education;
- The managerial team places a strong emphasis on evaluating the curriculum in its entirety, monitoring the teaching process, evaluating pupils' results as to their cognitive, emotional and psychomotor development, evaluating the teaching staff with respect to their training, teaching competence and relevance of their educational activity
- All teachers strive to adapt assessment to social requirements, raising the following questions:

What do we evaluate?

Educational efficiency, intellectual development, school results, proficiency, decisional competence,aptitudes, abilities, skills.

To what purpose do we evaluate?

Formative/summative, selective, aptitude counseling, etc.

Whom and what do we evaluate?

Pupils, a certain age group; skills, abilities, performance.

How do we evaluate?

Getting clear objectives all through the process, at its end or shortly thereafter.

By means of what do we evaluate?

- Oral, written, practical tests;
- Direct observation (structured or half-structured) during the process;
- Exercises, problems, essays, homework;

- Projects, reports, individual or team research work;
- Individual or institutional portfolio;
- Self-evaluation, pair and group evaluation, likely to increase self-realization and social

awareness.

The range of evaluation strategies is wide: from the traditional to the most recently
acknowledged, specific to this school, making wide use of IT.

Initial evaluations offer the necessary data to allow the school personnel to take the best decisions for a rigorous education of the pupils. Well known are the initial evaluations taken in the beginning of the high-school, in the 9th grade or for the students in 12th grade who must then prepare for the baccalaureate (the final exam). We are not neglecting that the lesson itself might be conceived as an activity for the initial evaluation. For the students in the 12th grade who are preparing for the baccalaureate, we are organizing final evaluations each year called simulations. Therefore there are tests in mathematics, informatics or Romanian. According to the results from these tests we organize the program of the preparation for the final exam.

There is an evaluation strategy profoundly formative, the project technique often used especially during the informatics lessons. The presentation for this type of project is made through an exam for the certification in the informatics field. Carrying it out requires an active participation from the student for the successive steps of self evaluation, encouraging the creativity.

A complex evaluation item, frequently used, which reflects the complexity of the student’s evaluation is the portfolio. Uniting essays, personal or group investigations, evaluation papers, reports, homework, the portfolio raises the student’s motivation for recognizing his own results and presenting the experience gained, the whole process of evaluation, implemented in the didactic and pedagogical activity of the teachers of our high-school, tries to make our pupils to discover their inside resources which could offer them trust in their own powers and in the responsibility feeling for the others.

Who benefits from the evaluation results?

Pupils, school- leavers, teachers, parents, curriculum designers.
In the last few years, the National Assessment and Examination Service has designed and

applied a national assessment program. The experience gained since 1998 has led to the following conclusions:

- The feedback is monitored by means of a) daily assessment and b) examinations;

- Formative feedback as a result of continual assessment reflects school performance, pointing out the pupil's strengths and weaknesses and helping us enhance and improve teacher – pupil communication;

- Summative feedback as a result of summative evaluation is a precious tool because it provides the teacher with the necessary data to change and adapt his teaching activity and the pupil to change and adapt the level of his achievements;

National assessment is extremely important for the teachers of the "TUDOR VIANU" National College of Information Technology, as we can observe the convergence between the assessed curriculum and the "official" one.

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