

International Conference on Engineering Education ICEE-2010



Engineering Education and Research for Society

July 18-22, 2010, Gliwice, Poland



**THE SILESIA UNIVERSITY
OF TECHNOLOGY**

Gliwice 2010

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Dear Colleagues,

It is my great pleasure to welcome all the participants of the ICEE-2010 Conference. There are almost two hundred of us this year – engineers, university staff members and industry representatives. I am delighted to welcome all the accompanying persons, whose contribution to the conference is significant and their presence is extremely stimulating.

The ICEE/ICEER conferences have been organized since 1994 in various countries worldwide and I am proud to say that representatives of the Silesian University of Technology have actively participated in almost all of previous conferences as well as in the activities of the ICEE/ICEER International Steering Committees and other bodies of iNEER - International Network on Engineering Education and Research bodies. This year the ICEE-2010 Conference is hosted by the Silesian University of Technology in the year of 65th anniversary of its establishing. With its main base in Gliwice in the Upper Silesia region, this University has been playing one of the most important roles in the engineering education in Poland since its beginning in 1945. Today the SUT is a self-governing state university offering various engineering courses at 13 basic faculties. Employing over 2000 academics, the University trains about 30.000 students. Industry of the whole country and in particular branches presented in Upper Silesia region benefit from our graduates and from the research work carried out here.

It is my privilege as Vice-Rector of Silesian University of Technology to invite you to participate in all events scheduled for ICEE-2010 Conference. I am sure that Gliwice is a perfect place for organization of such major event in the field of modern engineering education and research as well as innovations and entrepreneurship at universities. You will find yourselves in the city and region full of knowledge and high technology oriented initiatives, modern small and large industrial enterprises, as well as people who realize the vision of globalization of education and research in engineering. All sessions, workshops and exhibitions will be organised at the Education and Congress Centre in the middle of the Silesian University of Technology campus. The conference reception and cultural events will be held at picturesque historical places in Gliwice and its vicinity.

I know that a lot of ICEE-2005 participants consider coming back to Gliwice in 2010 to feel again the friendly atmosphere of modern engineering education and research professionals in the unique mixture of Silesia region industry, science and technology, beautiful Polish countryside and nearby monuments of worldwide history. I am sure that both new participants and our returning friends will be able to memorize ICEE-2010 as another especially successful conference in ICEE/ICEER series

I hope that all of us will have a fruitful and enjoyable time during the Conference.

Jerzy Rutkowski, ICEE-2010 General Chair





Dear Colleagues,

We are proud that ICEE-2010 - 16th International Conference on Engineering Education - is organised in Gliwice, Poland, by Silesian University of Technology and iNEER network, July 18-22, 2010. As you maybe know, ICEE-2005 conference was held also in Gliwice and was assessed by many of its participants as professionally highly successful event and also a memorable occasion for networking, establishing fruitful contacts and discovering Polish culture and people.

We are sure that there are good reasons for previous ICEE participants to come back to Poland and for newcomers to use ICEE-2010 occasion to become acquainted with Gliwice, Silesia region and engineering education in Poland. We want ICEE-2010 to be the same interesting for participants as ICEE-2005, we want also to assure past ICEE participants that you will be surprised by how much has changed in our fast developing and economically stable country.

ICEE-2010 conference main topic is "Engineering Education and Research for Society". We would like this conference to become an important forum for discussion on such hot topics as information and communication technologies based services, biotechnology and biomedical engineering as connected with quality of life, innovations and entrepreneurship with respect to education and professional career chances for universities graduates. We organised strong sessions on advanced e-learning solutions, project and problem based learning, Internet supported education, international mobility schemes for students, teachers and industry experts, new energy sources.

We want ICEE-2010 to address two major threats for engineering education today: economic crisis and decreasing interest in studying engineering among young people. We believe that both threats can be overcome only by going forward, i.e., by stimulating innovations and making its implementation possible, as well as by reshaping the engineering education models, methodologies and tools. We want you to come to Gliwice in July, 2010, to discuss these opportunities!

Enjoy your time at the Conference and your stay in Poland!

Wojciech Zieliński, ICEE-2010 Organizing Committee Honorary Chair



■ ■ **ICEE-2010 Committees**
Honorary Committe

Andrzej KARBOWNIK, Rector of Silesian University of Technology
Jerzy BUZEK, President of the European Parliament
Barbara KUDRYCKA, Minister of Science and Higher Education
Zygmunt FRANKIEWICZ, Gliwice City Mayor
Piotr USZOK, Katowice City Mayor
Małgorzata MAŃKA-SZULIK, Zabrze City Mayor
Adam FUDALI, Rybnik City Mayor

■ ■ **Organizing Committee**

Jerzy RUTKOWSKI – General Chair, Silesian University of Technology
Wojciech ZIELIŃSKI – Honorary Chair, Silesian University of Technology
Jerzy MOŚCIŃSKI – General Co-Chair, Silesian University of Technology
Krzysztof CZYŻ
Joanna DENKOWSKA
Paweł DOŚ
Jarosław KACPRZAK
Małgorzata KARKOSZKA
Agata KOCISZEWSKA
Andrzej LATKO
Marcin MACIĄŻEK
Małgorzata MICHALCZYK
Katarzyna MOŚCIŃSKA
Katarzyna WOJEWÓDKA

■ ■ **International Steering Committee**

Tomas CERMAK	Czech Republic	Carlos Sa FURTADO	Portugal
Win AUNG	USA	Denis GILLET	Switzerland
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Eduardo MONTERO	Spain	Frode Eika SANDNES	Norway
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Peter MOSON	Hungary	Costas TZAFESTAS	Greece
Ricardo NAVEIRO	Brazil	James UHOMOIBHI	Northern Ireland
Shan-Hwei OU	Taiwan	Ramon VASQUEZ	Puerto Rico
Maria da Graca RASTEIRO	Portugal	Bernardo WAGNER	Germany
Jean-Marc ROBERT	Canada	Wei-Chung WANG	Taiwan
Jerzy RUTKOWSKI	Poland	Che-Ho WEI	Taiwan
Hamadou SALIAH-HASSANE	Canada	Wojciech ZIELINSKI	Poland

ICEE-2010 KEYNOTE SPEAKERS

Erik de Graaff

Associate Professor Delft University of Technology (Netherlands)
Faculty Technology Policy and management
Extraordinary Professor Aalborg University
Editor-in-Chief of the EJEE (European Journal of Engineering Education)

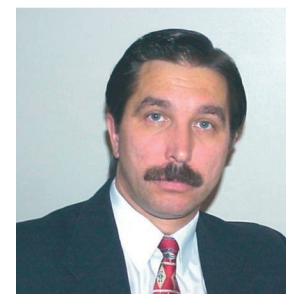
Erik de Graaff graduated at the University of Amsterdam in 1978, majoring in the psychology of work and organisation. He has been involved in the development university learning and teaching in University of Limburg in Maastricht and TU Delft, Holland. Dr de Graaff has contributed to the promotion of knowledge and understanding of higher engineering education through publications and through participation in professional organisations like SEFI – the European Society of Engineering Education, IGIP – The International Society for Engineering Pedagogy and ALE – Active Learning in Engineering Education. In 2006 Dr de Graaff was appointed as associate editor of the European Journal of Engineering Education. Since January 2008 he is Editor-in-Chief of the EJEE.



Vladimir Uskov

Professor of computer science and information systems at Bradley University (Peoria, IL, USA)
Director of the InterLabs Research Institute
Chair of the annual international conferences on Web-Based Education and Computers and Advanced Technology in Education

Vladimir Uskov is a professor of computer science and information systems at Bradley University, USA. He is also a Director of the InterLabs Research Institute at Bradley University. His areas of expertise include Web-Based Education, Online Education and e-Learning, Applications of Information Technologies in Education, Software Engineering, including Web-Based Software Engineering, and Programming Languages. Dr Uskov has more than 310 professional publications, including 3 textbooks, 3 book chapters, and 51 published articles in referred journals in 3 different



languages. Dr Uskov is a chair of the annual international conferences on Web-Based Education and Computers and Advanced Technology in Education and a Member of the Executive Board of the IEEE Technical Committee on Learning Technology.

■ ■ Bohdan Macukow

Professor of applied computer science at Warsaw University of Technology (Poland)
President of the Accreditation Commission for Technical Universities (KAUT)
Coordinator of the Quality of Education and the System of Studies

Bohdan Macukow graduated in 1969 from the Warsaw University of Technology, Poland, where he currently holds the position of full professor. Currently he is also the Coordinator of the Quality of Education and the System of Studies at the Warsaw University of Technology. He has published over 90 scientific papers and is also co-author of five books and author of the six chapters in scientific monograph. His current research interests are: applied computer sciences, mathematical and computer modeling of recognition systems and associative memories. He serves as expert in the field of Internal Quality Assurance and Assessment Systems as well as Universities Accreditation.



■ ■ José Carlos Quadrado

President of the Instituto Superior de Engenharia de Lisboa, ISEL (Lisbon, Portugal)
President of the Ibero-American Engineering Education Association (ASIBEI)
Vice-President of the European Society for Engineering Education (SEFI)

José Carlos Quadrado is the full professor of electrical machines in the electrical engineering and automation department of the Instituto Superior de Engenharia de Lisboa (ISEL), Portugal. Currently he holds the position of President of ISEL. He holds the positions of President of the Ibero-American Engineering Education Association (ASIBEI), board member and founding member of the International Federation of Engineering Education Societies (IFEES) and vice-President of the European Society for Engineering Education (SEFI). Dr Quadrado is author of over 100 international publications in journals and books, holds several patents and international technical prizes and scholarships and serves as editor and editor-in-chief in some engineering education journals.





INTERNATIONAL CONFERENCE ON ENGINEERING EDUCATION ICEE-2010

18 – 22. 07. 2010
GLIWICE, POLAND

■ ICEE Conferences Sequence

ICEE – International Conference on Engineering Education – is a global event for professionals in engineering education and research from all world universities. The first conference was organised by a group of enthusiasts in 1994 in Taipei, Taiwan. Due to its evident success the conference was repeated in 1995 again in Taipei, Taiwan, and in 1997 moved to Chicago and Carbondale, U.S., proving high interest in engineering education among American universities. One of the largest ICEE conferences was organised in 1998 in Rio de Janeiro, Brazil, and similarly successful event was held in 1999 in Ostrava and Prague, Czech Republic. In 2000 ICEE conference returned to Taiwan – this time to Taipei and Tainan, whereas in 2001 it was moved to Oslo and Bergen, Norway. Two subsequent conferences were also organised in Europe – in Manchester, UK, in 2002, and in Valencia, Spain, 2003.

In 2004 the first ICEER – International Conference on Engineering Education and Research – was organised in Olomouc, Czech Republic, as more research oriented variant of ICEE conference. In the same year ICEE event gathered the engineering education professionals in Gainesville, U.S.. Similarly there were two ICEE sequence conferences in 2005: ICEER conference in Tainan, Taiwan, and ICEE conference in Gliwice, Poland. In 2006 the conference was hosted by University of Puerto Rico at Mayagüez, San Juan, and in 2007 again in Europe – in Coimbra, Portugal. University of Pecs, Hungary organised ICEE event in 2008 and first joint ICEE&ICEER conference was perfectly prepared by Korean universities in Seoul, South Korea.

In 2010 ICEE conference came back after five years to Gliwice, Poland.

■ iNEER and ICEE&ICEER Conferences

iNEER – International Network on Engineering Education and Research – is a networking organisation for professionals in the field of engineering education and research that aims at helping in finding and maintaining contacts between teachers and researchers from universities worldwide in order to create and implement cooperation schemes and projects. iNEER is also a platform for university teachers and researchers to exchange their opinions with people from industry as well as government bodies and to cooperate jointly in the area of lifelong learning and knowledge based society. Basic aim of iNEER organisation is to deliver new effective methodologies and tools that enhance the engineering education process and make it competitive in response to vividly changing challenges of modern world, globally geographically and completely with respect to society profile. In view of these goals iNEER is open for not only teachers and researchers but also students, practicing professionals and other interested individuals.

iNEER organises various events, creates platforms for exchanging ideas, publishes information in various forms and by various means, coordinates international enterprises and provides invaluable guidance and sponsorship for innovative initiatives.

iNEER is also originator and principal co-organiser of sequence of ICEE (and ICEER) conferences. ICEE conferences serve an important role of global forum for exchanging information on good practices as well as innovations and achievements in the field of engineering education and research, in a face-to-face manner. Several important topics concerning entire society education purposes formed the mainstream of ICEE conferences sessions throughout the last fifteen years. Conference papers, plenary lectures and panel discussions were always in vast majority directed towards future – and sometimes futuristic – ways, systems and technical sources related to engineering education. ICEE conferences programs are always visionary in nature – created jointly by national/university organising and programme committees, iNEER bodies and ICEE/ICEER International Steering Committee, ISC. ISC, formed by several highest level professionals from many countries, is responsible for high quality of ICEE conferences



scientific and technical programmes and its relevance with the task of supporting worldwide progress in engineering education and research as well as creating links and platforms for cooperation between teachers and researchers from universities worldwide.

ICEE-2010 conference in Gliwice, Poland, with its motto “Engineering Education and Research for Society”, fits perfectly well into INEER and ICEE/ICEER conferences mission.

■ ■ About us

The Silesian University of Technology has a history of 65 years. It has become an important public culture and opinion-forming institution, deeply rooted in the city of Gliwice and Upper Silesia region. The Silesian University of Technology is the biggest technical university in our region and one of the biggest in Poland, currently educating about 30 000 students on 12 faculties in 49 engineering disciplines. We provide graduates of engineering who are ready to work as managers of Silesian industry and of enterprises far beyond our region. As an organization with big research and teaching potential we exert stimulating impact on the growth of Silesia and Zagłębie and significantly contribute to the creation of the economy based on knowledge management. The Silesian University of Technology was founded as the scientific and didactic base for the most industrialised region in Poland and one of the most industrialised areas in Europe: Upper Silesia. Nine faculties of the Silesian University of Technology are located in Gliwice – the main seat of the University, and the remaining three in Katowice and Zabrze. Besides, lectures are held in Rybnik, Bytom, Dąbrowa Górnicza, Tychy and Sosnowiec, covering the whole area of Upper Silesia.

■ ■ PRELIMINARY PROGRAMME

■ ■ SUNDAY, 18.07.2010

10:30 - 14:00 Optional pre-conference meetings
17:00 - 20:00 Registration (Education & Congress Centre, ECC)
18:00 - 20:00 Welcome Reception (ECC)

■ ■ MONDAY, 19.07.2010

08:30 – 10:30 Registration (ECC)
10:00 – 11:00 Conference opening session (ECC)
11:00 – 12:00 Plenary session P1 / Press conference (ECC)
12:00 – 13:15 Lunch (ECC)
13:15 – 15:00 Parallel sessions M13 (ECC)
15:00 – 15:15 Coffee break (ECC)
15:15 – 15:45 Leaving to New Gliwice
15:45 – 17:30 Special plenary session SP1 (Education and Business Centre, EBC)
17:30 – 19:30 Reception hosted by Gliwice City Mayor, New Gliwice guided tour (EBC)
19:30 – 20:00 Leaving to St. Peter and Paul's Cathedral
20:00 – 21:30 Musical concert (St. Peter and Paul's Cathedral)

■ ■ TUESDAY, 20.07.2010

09:00 – 10:00 Plenary session 2 (ECC)
10:00 – 10:15 Coffee break (ECC)
10:15 – 12:15 Parallel sessions T11 (ECC)
12:15 – 13:30 Lunch (ECC)
13:45 – 18:30 Trip to Ojców National Park
18:30 – 20:30 Dinner in Chocholowy Manor, Jerzmanowice
~ 22:00 return to Gliwice



■ ■ WEDNESDAY, 21.07.2010

09:00 – 10:00	Plenary session P3 (ECC)
10:00 – 10:15	Coffee break (ECC)
10:15 – 12:15	Parallel sessions W11 (ECC)
12:15 – 13:30	Lunch (ECC)
13:30 – 15:30	Parallel sessions W13 (ECC)
15:30 – 15:45	Coffee break (ECC)
15:45 – 17:45	Parallel sessions W16 (ECC)
18:45 – 19:15	Leaving for banquet
19:30 – 21:45	Conference Banquet, iNEER Awards Ceremony (Chata Polaka)
~ 22:00	return to Gliwice

■ ■ THURSDAY, 22.07.2010

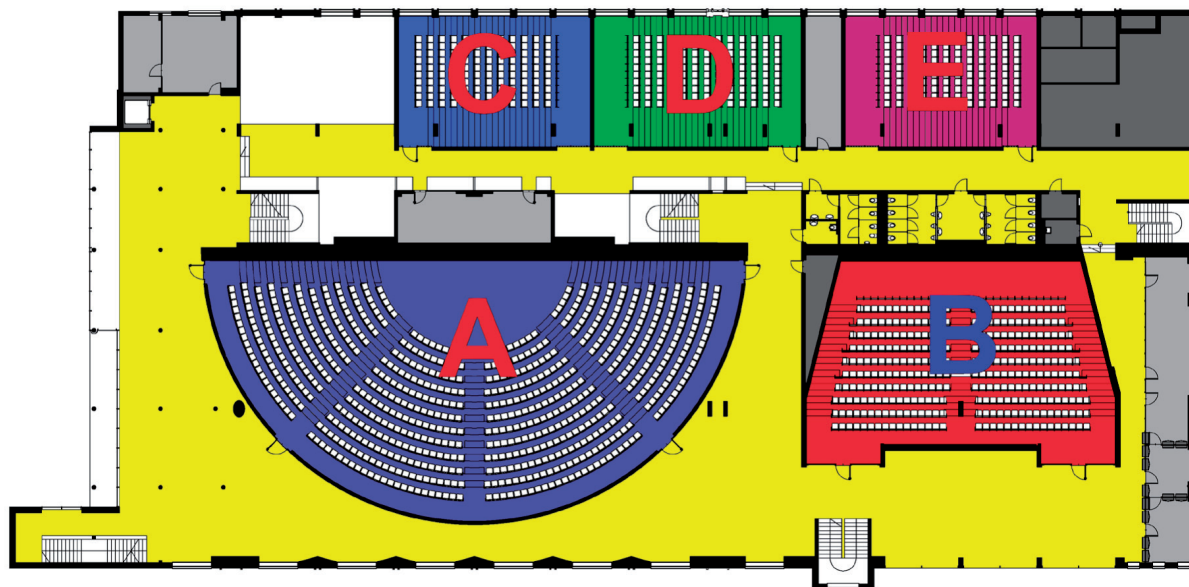
9:00 – 10:00	Plenary session P4 (ECC)
10:00 – 11:30	Parallel sessions R9 (ECC)
11:30 – 11:45	Coffee break (ECC)
11:45 – 12:30	Conference ending session R11 (ECC)
12:30 – 13:30	Lunch (ECC)

■ ■ Education and Congress Centre (ECC) – main ICEE-2010 venue

There are 2 large halls in the ECC for plenary meetings: Room A and Room B. Both rooms are accessible from ground floor as well as from 1st floor.

There are 3 auditorium rooms C, D and E for parallel sessions, also accessible from ground floor and 1st floor.

There are 5 general purpose rooms F, G, H, I and J, accessible from 2nd floor of the ECC, which are used for parallel sessions, Internet access and other meetings.





■ ■ Information for ICEE-2010 presenters

■ ■ Oral presentation guidelines

The total time limit for a speaker is 15 minutes, of which 12 are assigned for presentation and 3 for discussion. All session rooms are equipped with a personal computers with presentation software and data projectors. If you need an overhead projector for transparencies please let us know at least one day in advance. There will be Internet access (including wireless) during presentation.

If your presentation was sent by e-mail early enough to be placed on the conference CDROM, it will be put on presentation computer by conference staff. Otherwise please provide conference staff with your presentation (CD, USB) at least 20 minutes before your session.

Please report to the session Chairperson 10 minutes before the session.

■ ■ Poster presentation guidelines

The authors will be provided with stands for A0 posters (108cm × 78cm), portrait orientation. The posters should be printed in advance. Please, make your presentation interesting and legible from distance – use large fonts, include graphs and figures.

Assemble the display about an hour before the poster session opens. Be present till the end of the session in order to answer questions and exchange ideas.

■ ■ Trips during ICEE-2010 conference, Gliwice 18-22.07.2010

■ ■ Trip to Ojców National Park

Ojców National Park is a National Park in Poland, established in 1956. It takes its name from the village of Ojcow, where it also has its headquarters.

The Ojcow National Park preserves valleys of two small rivers, Pradnik and Saspowka. The park includes 385 hectares of the strict nature reserve. Its fauna consists of about 6,000 animal species. It may be, with its area of mere 21.5 sq. kilometers, the smallest of Poland's twenty national parks but it ranks among the most attractive recreational areas in the country, and it is just a 15 minutes' drive – or 24 kilometers – northwest of central Cracow.



It is a land full of caves, castles and unusual limestone cliffs, ravines and rock formations. There are several routes possibilities, which includes the most interesting places for sightseeing:

Renaissance Castle in Pieskowa Skala, the largest in the park King's Lokietek Cave, Dark Cave with prehistoric inhabitants, the ruins of a medieval King's Casimir castle in Ojcow, an unusual rock called "Hercules' Club" and the Cracow Gate. More information about



Ojców National Park and its interesting places could be found here:
http://www.ojcow.pl/english/map_park.htm



<http://www.staff.amu.edu.pl/~zbzw/ph/pnp/ojco.htm>

The tour for ICEE-2010 participants consists of most important and interesting sightseeing places. At the beginning of the tour your guide will show you the XVI century castle ruins in Ojcow. Then you will visit the Castle Ruins in Ojcow, take the walking tour to "Cracow Gate" and "Spring of Love" and at the end go to the Dark Cave which is one of the most valuable archaeological places in Poland. Here were discovered remains of prehistoric man, our ancestor - Neanderthal. After visiting the cave, we will take a trip to Chocholowy Minor, where the ICEE-2010 participants take rest after exhausting Ojcow National Park **Dinner and taking rest in Chocholowy Manor, Jerzmanowice** Chocholowy Manor is a wooden residence located in Jerzmanowice, in the picturesque scenery of Ojców National Park. It offers nicely appointed, air-conditioned rooms with satellite TV and free Wi-Fi.

Situated near the national road 94, just 15 kilometres from Krakow, this property will be the perfect base for exploring the Polish Jura Chain.

During your stay you can relax in the beautiful restaurant of Chocholowy Dwór, where excellent breakfasts, lunches and dinners are served. In the summer you can enjoy your meal on the open-air terrace or on the courtyard. The Chocholowy Manor is surrounded by a vast garden with a children playground, a place to prepare barbecue and a full tennis court.

For our ICEE-2010 participants there will be offered a special concert of a folklore polish band. It will be a perfect chance to admire traditional polish music from south part of Poland.



■ ■ Practical tips

In case of emergency, please call 112 [available on mobile devices too]. It is also ambulance service, police and fire brigading contact. If you need a taxi, please ask at reception or call the number: 032/231 91 92; 032/230 77 43; 032/270 23 10

■ ■ After hours

Cinemas

There are few cinemas in Gliwice. Please ask for current repertory at the reception desk.

■ ■ Spare time

In the spare time we invite you for a walk in the park of Frederic Chopin and a visit to the Municipal Palm House. There you can find four pavilions of usable plants, tropical plants, and succulents as well as aquariums with turtles, reptiles in terrariums or exotic parrots and canaries. The oldest plants are over 100 years old.





■ ■ Active tourism:

The Beskidy Mountains are an ideal place for walking tourism. It is about 60 km far from Gliwice and it offers the beautiful landscapes. In the Beskidy Mountains you can find the network of marked tourist routes and numerous refuges. You can also visit the Jura, the place between Krakow-Częstochowa Upland. There are also some excellent areas for recreation. Jura is well-known from its offer for fans of extreme sports, such as quad riding, bungee jumps or mountaineering.

■ ■ Banks, money, exchange

Banks in Poland are open from 9 a.m. till 6 p.m.

The Polish currency is Polish zloty (PLN).

The exchange rate is about 1euro = 4,20 zł
and 1USD=3,40 zł.

1 Polish zloty /PLN = 100 groszy

Coins: Grosz: 1,2,5,10,20,50

Zloty: 1, 2, 5

Banknotes: 10, 20, 50,100,200

In most shops, supermarkets, hotels and restaurants you can pay by credit cards without any problems. You may also use the cash machines (ATM). Check payment may be a little more complicated but traveller's checks can be realized in major banks without any difficulty.

You can exchange money in a „kantor” (exchange office) or in a bank, but exchange offices are more convenient.

■ ■ Shops

Shops are open from 10 a.m. till 6 p.m. from Monday to Friday. On Saturdays all shoppingcentres work from 10 a.m. to 2.p.m..

Most shops are located in the city centre, close to Silesian University of Technology and main hotels.

There are also numerous supermarkets at the outskirts of Gliwice, open from 9 a.m. till 8 p.m.

■ ■ Medical care and insurance

If you are a citizen of the European Union you just need to get an E-111 form in your country which will give you the right to use the medical assistance in Poland.

■ ■ Transport

For a foreigner in Poland using a taxi would be the best choice. The municipal transport system is also well organized, but since the information at the bus stops and in the buses is only in Polish it may be very complicated for a foreigner to use it.

■ ■ Telecommunication and post office services

In Gliwice there are not a lot of public phones. To call abroad you may use a special phone cards which you can purchase at post offices. The main post office is located in Górnych Wałów Street.

■ ■ Useful information

Country code: 0048, area code: (0)32

Power supply: 220-230V AC, 50 Hz



■ ■ Useful words in Polish

Good Morning	Dzień dobry
Thank you	Dziękuję
Please	Proszę
Excuse me	Przepraszam
Yes	Tak
No	Nie
I don't understand	Nie rozumiem
How much does it cost?	Ile to kosztuje?

■ ■ Websites

Silesian University of Technology: www.polsl.pl
Visitors Guide : www.polsl.pl/en
www.polsl.pl/en/Strony/Gettinghere.aspx
www.polsl.pl/en/Strony/Wheretostay.aspx
www.polsl.pl/en/Strony/TouristAttractions.aspx
www.polsl.pl/en/Strony/HistoryofGliwice.aspx
www.polsl.pl/en/Strony/Practicaltips.aspx

About Gliwice: www.um.gliwice.pl
About Poland: www.poland.gov.pl

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GLIWICE CENTRUM

skala · scale 1 : 8 000

- linia tramwajowa
tram line
- droga jednokierunkowa
one way road

- cmentarz, park
cemetery, park
- sygnalizacja świetlna, parking
traffic lights, car park
- hotel, dom studencki
hotel, student house
- stołówka
canteen
- policeja
police station

- poczta, pomnik
post office, monument
- hala sportowa
sports hall
- kościół, kościół zabytkowy
church, historic church
- teatr, kino
theatre, cinema
- muzeum, zabytek architektury
museum, monument of architecture

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