Incorporation of IT and Library Resources

Hamedani, Rayeheh; Kronkvist, Björn; Prieto de la Fuente, Paulina; Willumsen, Pi

2011

Incorporation of IT and Library Resources

Their contribution in the learning process during the first years of university studies

Report presented as part of the program

Introduction to Teaching and learning in Higher Education

June 2011

Rayeheh Hamedani,

Björn Kronkvist,

Paulina Prieto de la Fuente,

Pi Willumsen

Lund University, Faculty of Engineering

Teachers, Anders Ahlberg, Roy Andersson, Torgny Roxå

Outline of report

1. Introduction

Information flows and time constraints have put a huge pressure on students in higher education today. First-year undergraduate students often have difficulties when it comes to dealing with the abundance of information they are introduced to during their education. They therefore need guidelines in information skills in terms of being able to organize data, evaluating sources, taking strategies to search web sites, reflecting, interpreting and graphically illustrating the collected data. Students need to learn to digest the large amount of information they are exposed to in order to generate new outcomes. Transfer of knowledge between faculty members, IT professionals, and librarians is important to help students achieve these qualities. Even though members engaged in a university course can agree on the meaning of the general skills that they want to transfer to the students, they may have very different approaches in how they implement these skills in their individual teaching according to the faculty culture and their own specific literacy and IT training.

A new report from Griffith University, Australia shows that the technological changes in a first-year sociology course resulted in improvement of the students' technological skills. Publishing their own works on YouTube encourages "young people out of their comfort zones" (Lovell 59). Furthermore, the way of information gathering helps students to reflect on "what is learnt… what others think and to become a community of thinkers." (Lovell 59).

English studies at Malmö University have technical skills as an integrated part of the education and "It's learning" is an interactive platform which enables students to publish their assignments online, create their own blogs or digital portfolios, check their e-mails and download teachers' hand outs before lectures (http://www.mah.se/ITsupport/Program-och-tjanster/Its-learning-/Its-learning/)

A large American study of how the teachers used and integrated IT-technology in their teaching revealed a general pedagogical problem: teachers don't use technology in student learning and critical thinking. One reason for this is "the lack of adequate training and lack of understanding of how computers can be used to enrich the learning process" (Stobaugh and Tassell 154). To address this problem of integration and use of IT-technology in the teaching process, the faculties must have a technological vision that actively seeks to influence the

departmental culture. The faculty also has to ensure that the faculty members have updated IT-technology knowledge and skills.

Julien & Given studied the Librarian-faculty relationship and how they interact with the students to improve their academic information literacy (IL). They show that libraries in academic environments are often given in a supporting role in relation to the faculty. Some interviewees describe faculty culture as a major point of conflict and express the difficulties to achieve cross-disciplinary approaches. Another paper presented at the conference "Mötesplats inför framtiden" in Borås 2006 describes, however, a cooperative teaching style of faculty-librarian working relationships. The librarian Kajsa Gustafssom Åman outlines how the faculty library succeeded to plan library-hours into courses or assignments (http://bada.hb.se/handle/2320/3905)

The common thread running through these publications is the challenge of implementing other resources e.g. IT and librarians, into the faculty courses to achieve the best knowledge transfer to the students. In this paper we investigate the cross-disciplinary teaching approaches applied when library and information technology is integrated into the first year courses at Department of Earth and Ecosystem Sciences, Division of Geology. The strategic plan of this faculty states that students during the course should master "self-contained study technique, presentation skills and academic writing". In this paper we examine how the faculty teachers, IT professionals and Librarians cooperate to achieve these targets during the course named GEOA01. To get a better understanding of their cooperation in relation to the first semester courses we interviewed four people from the Division of Geology, the Institute of Earth and Ecosystem Sciences, Lund University.

2. Research questions

The following three main research questions were used as a background for the case study undertaken as part of this project.

1) From a pedagogical perspective, how do the teachers, IT and librarian resources collaborate during the first semester of undergraduate courses at the University?

2) How does knowledge transfer work between students, teachers, IT and library resources, before, during and after courses?

3) Which role does the IT and librarians have in the teaching process from their own point of view and the teachers' point of view?

3. Theoretical framework

3.1 The use of IT-technology in teaching

The ability to locate and manage information has increased dramatically the last 20 years and this requires information skills. Information technology skills are the basis for the process of "learning to learn" and to be able to deal critically with information and thereby sort it into a personal knowledge base. Lifelong learning is considered a key theme by UNESCO in the 21st century and it goes beyond traditional education (Pinto and Sales 59). Herein, we focus on what is known on how knowledge transfer of information skills takes place from a pedagogical perspective.

Active learning techniques are student-centered. The teacher's role is to guide the student towards the learning activities, organize the resources, guide discussion and investigations and give feedback. Teachers act as guides, mentors and facilitators of learning and this type of student-centered learning focus on intrinsic motivation and cooperative learning. An essential contribution to this type of learning comes from the *Bologna process* which placed the concept of competence as a central part of higher education in general. However, competence is more than knowledge or skills. Transfer of competence requires both the mobilization of knowledge, cognitive and practical skills, as well as social and behavioral components such as attitudes, emotions, values and motivations.

3.2 Information literacy

The implementation of the European Higher Education Area (EHEA) involves 47 European countries today. The Bologna declaration contains three major areas: the mobility, employability of citizens, and international competitiveness of European higher education. The employability of citizens put a great emphasis on general competences and skills (Regeringskansliethttp://www.sweden.gov.se/sb/d/9267).

Lund University works with the following strategies: "(1) quality assurance; (2) cross-disciplinary collaboration; (3) internationalization; and (4) leader, teacher and employee excellency" (Policy for quality assurance…http://www5.lu.se/office-of-evaluation/quality-assurance/quality-assurance-and-the-bologna-process). A policy has been adopted by the University Board in 2008 that states that librarians along with academic advisors, managers and administrative staff have the responsibility to put the students' learning at the center of attention. This policy put emphasis on the student-centered learning instead of the teaching-centered system. The idea is that "Learning-by-doing" engages students in activities and makes them organize, analyze and interact with each other.

In Spain, a different model have emerged for the implementation of information literacy problem-solving processes and it can be divided into six steps: "task definition, information seeking strategies, location of and access to resources, use of information, synthesis, and evaluation" (Pinto and Sales 60). Training proposals in information literacy has to be targeted to user's needs. Therefore, the first step is a tailored analysis of information's needs, concepts, and behaviors prevailing among the users (students and faculty members) with regard to seeking and using information and IT in general.
Pinto and Sales report that since the implementation of Bologna in Spain, librarians have started to develop their courses in collaboration with faculty members and students. Information literacy training is followed by library orientation for first-year students later on during the programs. Librarians arrange clear-cut activities with personalized courses. At the same time, they face the challenge of analyzing students' information needs at an early stage of the program. They recommend that the teachers during development of educational programs differentiate between two types of desired competences: general basic ones that are needed in all professions and specific ones that includes knowledge and specializations in relation to a particular profession (Pinto and Sales 59). In Geology this could be the ability to do geological observations in the field, make a geological map and use geological terminology in a correct way.

3.3 What skills we talk about (generic attributes)

The academics' point of view on graduate attributes vary according to Simon C. Barrie. Some academics express generic skills in terms of "Additional or Complementary conceptions", sort of allround qualities that any graduate should have despite the discipline of study. Other academics interpret generic attributes as the core of the field study. In Barrie's word, they talk about "Translation conception" and "Enabling conception" which provide "both form and function to disciplinary knowledge" (Barrie 229). These abilities are transformative and help students into a process of inquiry and the discovery of new knowledge.

An academic study according to Biggs SOLO-taxonomy has really taken off when generalization of the subject studied ends with new knowledge. That is the core of transfer knowledge. This approach is directly connected to Dennis Fox's "Personal theories of teaching". Dennis Fox's divides teaching styles into four major types: transfer theory (a good teacher, who finds the best way to structure the information), shaping theory (trains students to become professionals/specialists), traveling theory (guides the student through the subject) and growing theory (puts emphasis on the student's internal learning process). While the transfer and traveling theories focus on the subject, the other two have the student in focus. Each theory prescribes clear-cut objectives and has a function in a given context (Fox 157-158).

The fact is that Barrie is not surprised seeing different existing points of view on generic attributes. What is surprising to him is that the staff thinks they can achieve a curriculum reform without understanding the nature of these attributes and how they are related to the disciplinary knowledge at the university. Barrie talks about "the embedded attributes" in the disciplinary knowledge and means that it is integral to students learning outcomes (Barrie 230).

A report on meaningful communication has been done at Lund's University and the investigator Åsa Lindberg-Sand reports that the Division of Geology is working especially with a project called "Skuggande läroplan". This project deals with the best way to create a proper geologist. They want know what kind of skills students need and to develop their teaching and examination methods (Lindberg-Sand 23).

3.4 How do these skills help students in knowledge transfer?

Pinto and Sales report on an educational portal called *Alfin-EEES,* which is a good example of a technological tool that helps students in their process of knowledge transfer. Alfin-EEES portal contains six blocks "learning to learn; learning to seek and assess information, learning to analyze, synthesize, and communicate; learning to generate knowledge; learning to work with others; and using technology to learn" (Pinto and Sales 66-67). They are commonly based on general activities in order to demonstrate to the students similar models to their field of study; resources in order to offer tutorials, electronic documents and bibliographical information; and an advice section to share experiences with students and teachers in the same discipline.

All these portals along with Malmö University It's Learning or Lund city's *UNIKUM* make students communicate more easily with each other in their team-work or with teachers. An effective way to grasp students' needs is to examine the students' assessments and offer the feedback they need.

The content of the courses (here GEOA01) and how it is selected, organized, presented and evaluated rest on the teaching-learning environment at the faculty of Geology. The librarian points out that there is an increasing need for information specialists in the faculty. A librarian with some academic credits on Geology would be an adequate choice. It makes students aware that the library's function is not only to serve students with searching techniques, evaluating sources and other general skills but also to support them in the disciplinary knowledge.

4. The first semester course at the Division of Geology at Lund University – a case study

To examine how the faculty members, IT professionals and librarians cooperate, to achieve the targets outlined in the strategic plan of the faculty of Lund University, we chose to study their interaction during the first semester course named GEOA01. This autumn course is held by the Department of Earth and Ecosystem Sciences. For the undergraduate students this is most often their first meeting with the subject of Geology, because until 2011 Geology was not a part of the primary and lower-secondary school curriculum.

The aim of the four semi-structured interviews were, as outlined in the research questions in section 2, to examine the overall interaction between the non-faculty members, Librarian and IT-personel, and the faculty members in their efforts to achieve transfer of academic information literacy (IL) and IT skills to the students.

4.1 Description of the first semester course named "Planet Earth – an introduction"

The first semester course GEOA01 or *"Planet Earth – an introduction"* is a basic introduction to the main geological features of the 4.5 billion year old Earth (Appendix II & III). The course coordinator U. Söderlund and one of the main teachers, L. Barnekow both state that stimulating the student´ curiosity is perhaps "the most important part of this course". But it is also important to train them in scientific writing and make them understand basic geological concepts such as e.g. the geological timescale.

The students are taught by a large number of faculty members (about 15 people) during the first semester course named GEOA01. However, four teachers, U. Söderlund, L. Barnekow, P. Ahlberg and S. Björck, undertake the main part of the teaching and the general mentoring. Ulf Söderlund is the course coordinator, Robin Gullstrand, is the librarian and Gert Pettersson is the one taking care of the IT-technology at the Division of Geology. Another main teacher, L. Barnekow, was also selected for an interview. The Librarian, Robin Gullstrand, is head of the Geological library that is located in the same building as the Department of Earth and Ecosystem Analysis.

4.2 Interviews

The method used is a qualitative case study in mini scale. To deepen our knowledge of the presented themes we studied schedules, course descriptions, course evaluations and conducted semistructured interviews with four different faculty staff involved in the course. The questionnaires consisted of seven questions and were mailed to the respondents before the interviews took place. The estimated time for each interview was 30 minutes. The informants were encouraged to answer freely, our group of interviewers took notes during the conversation and the interviews were recorded.

During the first two interviews with the course organizer, and the librarian, we realized that the first introduction to academic information literacy during course GEOA01 (Planet Earth – an introduction) is closely linked to another first year course named GEOB01 (Evolution of life). Based on Bologna recommendations, the librarians at Geology are gradually introduced, where academic information literacy skills are gradually being expanded during the first three years up to the exam assignment named GEOX01 (See web link: http://www.geol.lu.se/gu/).

4.3 Summary of interview results

Notes were taken by the three interviewers and they were also recorded for back-up purposes. Those notes have been compiled together and the most relevant findings are presented below.

4.3.1 Ulf Söderlund – course coordinator

A team of faculty teachers share the teaching with a substantial number of supporting colleagues for specific lecturing (See schema för GEOA01 Appendix III). Collaboration is excellent, focused on the team of four, even though the number of involved faculty is somewhat hampering. There is no established link to the librarian at this stage, but that changes during the subsequent semester course named GEOB01 (Appendix II). Instead, the contribution from the library is focused on report writing and reference methodology. The structure of the course includes quite a number of seminars, which are taken care of by the students themselves. This is a conscious pedagogic measure, which has been proven successful. Another important objective of this basic course in Geology is to enhance learning and observing without guidance. Course evaluation is treated seriously and dealt with by "the team of four" even though all others are invited to participate. This course has no formal exams, but is based on excursions and short assignments. However, the person responsible for the transfer of literacy and information skills is not involved in those evaluations. Additional support is appreciated to address presentation techniques, especially when it comes to writing reports. Finally, the course coordinator concluded that the course, still very successful, has reached a sensible phase.

4.3.2 Lena Barnekow – one of the main teachers

The primary objective with this basic course is to create interest, offer inspiration and make the students able to explore individually. The course is perceived as excellent as designed at present time. In particular, the field excursions to Kullaberg were praised, offering possibilities to study issues on the spot by means of observations and subsequent individual reports of such common observations. At this stage and with such objectives there are no needs for close links to the library. Literature research is not part of the studies, but documentation by means of photographs is often used. Traditional marking of specific achievements is replaced by evaluation by the main teachers together. The evaluation is done from a holistic point of view of each of the student's performance. What IT concerns, there is an invitation for individual support. The "Skuggande läroplan" is a four-year long training program with the aim of developing the student's communication skills. The teacher, L. Barnekow, has the opinion that this program is an excellent concept which is fully integrated into the course.

4.3.3 Robin Gullstrand – the Librarian

With a formal training as a humanist, Gullstrand regrets lack of specialist competence in the area of, in this case, geology. In his opinion, the qualitative support is an increasing part of a librarians work. An additional qualitative support would also result in closer cooperation between the literacy competence and the research carried out at the Department. The librarian is involved in four courses on three levels. Two courses on level one include short and basic introduction to the library organization followed by a more serious insight into library catalogues, reference databases and work on literature references associated with excursion activities. The second year course includes searching methodology from a range of sources. Also, the students are requested to make searching on their own to support their articles. Furthermore, the students are training to find relevant knowledge, references and sources. Quite recently, a member of staff has joined the Library team, with the dedicated task to take care of education, primarily on Masters Level as support to exchange students, and possibly expanding services to the Division of Ecosystem Sciences which makes up the other half of the Institute of Earth and Ecosystem Sciences.

4.3.4 Gert Pettersson – the IT competence

Today working full time with IT, G. Pettersson got a PhD within the field of geology. His contribution to the education in course GEOA01 is very limited and two hours are allocated for a general IT- introduction. His focus and main task is to keep the network and other systems within the institution up and running. He has a well developed cooperation with the library. Besides, he is always available for IT support of all kinds to all individuals within the organization. Teachers are supported with software knowledge needed for their activities. In addition, he offers hands-on support for the teachers with their electronic information. Homepages, interactive programs and similar software development are close to his heart and the institution offer significant opportunities for such development as many routines today would benefit from improvements of this kind. Gert Pettersson, informed us that they are on trial for *Content Management System* (CMS) at the faculty. Some systems and portals in use are LUVIT for distance courses and the portal *My course* Library.

5. Analysis of field study

The teaching style of GEOA01 is a combination of Dennis Fox shaping and traveling theories, it seems to work well in teaching where a combination of visual/practical aspects such as two geological fieldtrips as well as written reports and seminars carried out by the students. Students also have to read various textbooks. Both the course coordinator and one of the main teachers are completely aware that they are putting pressure on students. However, they state that presentation, report techniques and other general attributes activate students and make them study textbooks, which are integral to the course, at an early stage.

Regarding our first research question: “How is the collaboration between the teachers, IT and librarian resources during this first semester” the following observations are valued to be of major importance:

(i) The librarian and IT-resources have uncoordinated support functions, and they are not part of or associated directly with the course coordinator.

(ii) From a holistic perspective – looking at the entire bachelor program - the contribution by and incorporation of literacy resources are thoughtfully integrated into the educational program.

(iii) The IT technology is not used directly in student learning and critical thinking, probably due to the lack of a common vision within the Department of Geology and Ecosystem Sciences and the course objectives.

In relation to our second research question: "How does knowledge transfer work between students, teachers, IT and library resources, before, during and after courses?" we made the following observations:

(i) The way the course is structured and implemented provides a good ground for deep learning according to the student evaluations for the last three years.

(ii) The teaching combination of visual/practical aspects such as two geological fieldtrips and reports are well aligned with the course objectives. The teachers cooperate well in an informal manner. Thus, the IT- personnel are not considered from a teaching perspective.

(iii) For this basic course the Literacy resource has a limited involvement, but it is recognized as an important contributor in the program as a whole e.g. the librarian is taking active part in the evaluation of written assignments.

Regarding our third research question: "Which role does the IT and librarians have in the teaching process from their own point of view and the teachers' point of view?" A few observations were made:

(i) The teachers do not perceive any shortcomings in the involvement and support of librarians and IT-staff as it is well aligned with the objectives of the course.

(ii) The IT- responsible offers and provides services as requested by the present course structure and how the responsibilities are divided. However, when prompted, he suggested a number of possible improvements.

(iii) The Librarian appreciates the stepwise implementation of literacy skills that is already planned for the first three year of geology studies, but he points out that there is an increasing need for information specialists in the faculty. A librarian with some academic credits on Geology would be an adequate choice. It makes

students aware of the library's function not only to serve students with searching techniques, evaluate sources and other general skills but also support them in the disciplinary knowledge.

6. Conclusions

The library staff resources at the division of Geology are thoughtfully implemented according the Bologna Process. Three stages of general attributes are outlined: the first year covers primarily library orientation; the second is generally about searching databases, learning how to cite, evaluate references, etc.; the third focusing on searching techniques, citing databases as EndNote, etc. The librarian we interviewed has no idea about the course content (GEOA01) and it is up to students and teachers to get in contact with the library. Both the teacher and course coordinator acknowledge that their students often need to improve their skills on presentation techniques, writing an academic report, working with Adobe Photoshop, and using drawing programs to illustrate geological observations. The course coordinator has therefore plans to contact an external resource to meet these needs. Surprisingly, they don't ask either the librarians or the IT professional for help. Even though teachers state that they take advantage of lunch and coffee breaks to talk to the librarians they don't address this to them. We wonder why the communication between them is so minimal. It gives the impression that they don't actually know to what extent they can rely on the library staff to ask for help. In our field study we discovered, similar to Julien and Given's study, that librarian and IT staff are placed in a supporting role in relation to the faculty. The librarian, on the other hand, has a sense of being of more help if the library staff was subject oriented and had, for instance, some academic credits in geology.

The IT professional we interviewed has, however, a PhD in Geology discipline and great knowledge about different portals, Content Management Systems (CMS) and many ideas about how to improve and challenge the needs among students and teachers. So, what is lacking in their communication? No one of them mentions the lack of time as an excuse.

Simon C. Barrie has two major points in his study. First, he implies that the staff must get a good understanding of the nature of generic attributes. Secondly, he underlines how important it is to know to what extent IT and library competences are integrated to the

disciplinary knowledge. Our study shows that these attributes are integral to improve students IT skills but are not embedded into their schedule.

When we examine the students' assessments on GEOA01 from 2007 to 2010, we get a sense that the teachers have a tailored understanding of the students' primary information needs. However, the teachers don't really know how to respond to their needs. Although each of interviewees has a clear-cut definition of their own roles in relation to students they have very little information about the role of one another. The lack of communication between teacher, librarian and IT staff may rest on their unclear, undefined roles in relation to one another.

Concerning further improvements this study suggests:

(i) The available IT- resource and competence ought to be utilized in a better way, but this requires a conceptual review. The IT-professional at the Division of Geology, G. Pettersson, informed us that they are on trial for similar *Content Management System* (CMS) at the faculty. Some systems and portals in use are LUVIT for distance courses and the portal *My course* Library. This development should perhaps be prioritized and a number of the faculty members should be offered an improvement of their IT-skills. As a large American study showed, the lack of adequate training is the main reason why teachers do not use technology in student learning and critical thinking.

(ii) Concerning improvement of the students writing skills during the course, the teachers should seek to clarify the specific needs of the students and then collaborate with the existing literacy resources at the Institute.

References

Barrie, S.C. (2006). Understanding what we mean by the generic attributes of graduates. *Higher Education*. 51: 215-241.

Fox, D. (1983). Personal theories of teaching. *Studies in Higher Education*. Vol. 8, no. 2, 151-163.

Gustafsson Åman, K. (2006, 11-12 Oktober). *Undervisning I informationssökning vid Linköpings universitet, Campus Norrköping*. Retrieved Juni 10, 2011, from Borås högskola, Mötesplats inför framtiden Web site: http://bada.hb.se/handle/2320/3905

Julien, H. and Given, L.M. (2002/2003). Faculty-Librarian relationships in the information literacy context: A content analysis of librarians' expressed attitudes and experiences. *The Canadian Journal of Information and Library Science*. 27: 3, 65-87.

Lindberg-Sand, Å. (2004). *Meningsskapande kommunikation: granskning av kommunikationsprojektet vid Lunds universitet*. Retrieved June 10, 2011, from Lund University, Rapport nr 2004: 229, http://www.evaluat.lu.se/publ.htm

Lovell, S. and Baker, S. (2009). Digital narratives of youth transition: engaging university students through blended learning. *Youth Studies Australia*, Vol. 28, no. 4, 52-59.

Pinto Molina, M and Sales, D. (2008). Knowledge transfer and information skills for student-centered learning in Spain. *Libraries and the Academy*. Vol. 8, no. 1, 53-74.

Stobaugh, R. R. and Tassell, J. L. (2011). Analyzing the degree of technology use occuring in pre-service teacher education. *Educational Assessment, Evaluation and Accountability*. 23: 143-157.

Appendix I

Intervjufrågor

Hej!

Vi är en grupp som går *LTHs Högskolepedagogiska Introduktionskurs*. En del av kursen går ut på att göra en pedagogisk studie utifrån det material kursen presenterat och skriva en rapport. På grund av gruppens bakgrundsmässiga spridning, vi är en geolog, en designvetare, en bibliotekarie och en arkitekt tycker vi att det är intressant att se hur man på grundutbildningsnivå på universitet, med GEOA02 som fallstudie integrerar resurser på institutionen såsom bibliotekarie och IT-personal i undervisning samt hur detta medverkar i studenternas kunskapsomvandling, även kallat *knowledge transfer*. Knowledge transfer handlar om den process som är nödvändig för att en student skall koppla sambandet mellan teori och praktik. Vi ber dig därför läsa och tänka igenom följande frågor för att senare diskutera med oss vid överenskommet tillfälle när vi går runt på avdelingen för Geologi tisdag 7 juni mellan kl. 13.30 och 17.00. Vi beräknar ca 30 min. till at interview dig.

Tack på förhand,

Pi, Björn, Rayeheh och Paulina

1. Beskriv din utbildningsbakgrund i förhållande till denna kurs (GEOA02)

2. Hur beskriver du din roll i kursen, vilka krav och uppgifter uppfyller du?

3 .Hur initieras och integreras medverkan av bibliotek och IT-kompetens,
-vid kursprogrammets utformning?
-under pågående kursprogram?
-vid återkoppling efter genomförd kurs?
-som formaliserad medverkan kontra interaktiv tillgänglighet, alltså kommunikationen mellan student och undervisande under kursens gång (t ex vid självstudier)?

4.Hur kommunicerar de undervisande med varandra under kursens gång?

5. Vad är de formella och praktiska begränsningar av tillgänglighet

-tidsmässigt?

-finansieringsmässigt?

-ur prioriteringssynpunkt?

6. Utvärdering och betygssättning, hur koppas bibliotek och IT till kursens lärandemål och hur tungt väger detta vid betygssättningen?

7. Bortsett från tids- finansierings- och prioriteringsproblematiken, hur skulle du vilja utveckla din roll som undervisare i kurssammanhang?

Appendix II

GEKO Geologi Grundutbildning

Rekommenderad studiegång för kandidatutbildning i geologi

Inom ramen för examenskraven och med hänsyn till när de olika kurserna ges finns det goda möjligheter att skapa en egen utbildningsprofil med hänsyn till sina egna intressen. Diskutera gärna olika utbildningsalternativ med din studievägledare.

Bas-block 75 hp	GEOA01 Planeten Jorden – en introduktion	Ht 1	År 1
	GEOB01 Livet och utvecklingen	Ht 2	
	GEOB02 Klimatologi och geomorfologi	Vt 1	
	GEOB03 Litosfären	Vt 2	
	GEOB04 Sedimentologi	Ht 1	År 2
Tillämpade/ Valfria kurser	GEOC06 Mark och deponier GEOC02 Medicinsk geologi eller valfri kurs	Ht 2:1 Ht 2:2	
	GEOC04 Geofysisk undersökningsmetodik GEOP01 Hydrogeologi eller valfri kurs	Vt 1	
	GEOP02 Riskklassificering av förorenad mark eller valfri kurs	Vt 2	
	GEOP03 Georesurser och samhället eller valfri kurs	Ht 1	År 3
	GEOC06 Mark och deponier GEOC02 Medicinsk geologi eller valfri kurs	Ht 2:1 Ht 2:2	
	GEOC04 Geofysisk undersökningsmetodik GEOP01 Hydrogeologi eller valfri kurs	Vt 1	
Examens arbete	GEOX01 Examensarbete	Vt 2	

Naturvetenskaplig kandidatexamen i geologi

Fortsatta studier alternativt arbetslivet

utbildningsplan för kandidatutbildningen.

Appendix III

***GEOA01*, Planeten jorden – en introduktion, 15 hp (15 ECTS credits) HT-1 2010**

Kursansvarig: Ulf Söderlund

Lärare: PS = Prefekt Per Sandgren, GP = Dr Gert Pettersson, RG = Bibliotekarie Robin Gullstrand, US = Doc. Ulf Söderlund, SB = Prof. Svante Björck, PA = Prof. Per Ahlberg, GS = Doc. Göran Skog, MC = Doc. Mikael Calner, LB = Doc. Lena Barnekow, BS = Prof. Birger Schmitz, JO = Doktorand Johan Olsson, JL = Dr Johan Lindgren, RM = Doc. Raimund Muscheler, MG = Marianne Giselsson, EE = Doktorand Elisabeth Einarsson

E-post till lärare: fornamn.efternamn@geol.lu.se
Till Robin Gullstrand dock: Robin.Gullstrand@geobib.lu.se

Dag	*Dat*	*Tid*	*Moment*	*Grp*	*Sal*	*Lärare*
Mån	30/8	09.15-10 10.15-12	Introduktionsmöte Biblioteksintroduktion steg 1a	 1	243 Bibl	US RG
Tis	31/8	11.15-12 13.15-15 15.15-17	Presentation av institutionen Introduktion datasalarna Biblioteksintroduktion steg 1a	Alla 2	243 206 Bibl	PS GP RG
Ons	1/9	09.15-10 11.15-12 13.15-15	Föreläsning 1: Den geologiska tidsskalan Presentationsmetodik för seminarierna och instruktioner för rapportskrivning Studieteknik, instr. rapportskrivning, mm.		243 243 243	PA US MG
Tor	2/9	08.00-	Fältövning Kullaberg, med övernattning		*	US/SB/ LB/ PA
Fre	3/9	18.00	Fältövning NÖ Skåne		*	US/SB/ LB/ PA
Mån	6/9	10.15-12 15.15-17	Föreläsning 2: Jordens uppkomst, jordklotets sfärer Självstudier: uppföljning av fältdagar		243 -	US Självst.
Tis	7/9	10.15-12 13.15-16	Föreläsning 3: Plattprocesser Självstudier inför seminarium Jordens uppkomst och uppbyggnad		243 -	US Självst
Ons	8/9	10.15-12 13.15-15	Föreläsning 4: Mineral och bergarter Självstudier inför seminarium Jordens uppkomst och uppbyggnad		243 -	US Självst.
Tor	9/9	10.15-12 13.15-16	Seminarium 1: Jordens uppkomst och uppbyggnad Självstudier inför seminarium Plattprocesser		243 -	US Självst.
Fre	10/9	09.30-12	Föreläsning 5: Vulkanism, magmatiska och metamorfa processer		243	US
Mån	13/9	09.15-12 13.15-16	Självstudier inför seminarium Plattprocesser Laboration A: Mineral, bergarter och malmer		- 243	Självst. JO/US
Tis	14/9	10.15-12 13.15-16	Seminarium 2: Plattprocesser Forts. laboration A		243 243	US JO/US
Ons	15/9	09.15-16	Självstudier inför seminarium: Magmatiska och metamorfa processer i olika plattektoniska situationer		-	Självst.
Tor	16/9	10.15-12 13.15-16	Seminarium 3: Magmatiska och metamorfa processer i olika plattektoniska situationer Föreläsning 6: Magmatiska och metamorfa processer i ett plattektoniskt perspektiv – en syntes		243 243	US US
Fre	17/9	08.00-18	Fältdag: Kullaberg, Svanhall, mm.		*	US

Mån	20/9	09.15-12	Föreläsning 7: Radiogena isotoper, långlivade. Visning av laboratorier		*220	US
		13.15-14	Diskussion: Hela kursavsnittet		243	US
		14.15-17	Självstudier. Samlingarna tillgängliga		243	Självst
Tis	21/9	08.15-12	Självstudier, bearbetning fältrapport Kullaberg		-	Självst.
Ons	22/9	08.15-12	Självstudier, bearbetning fältrapport Kullaberg Lämnas in senast 12 (Ulfs postfack el. mail)		-	Självst.
		13.15-15	**Temaföreläsning Johan Lindgren:** *"Biomolecular preservation across deep time*		243	JL
Tor	23/9	09.15-12	Föreläsning 8: Sediment och sedimentbergarter		243	MC
		13.15-14	Fortsättning föreläsning 8		243	MC
Fre	24/9	09.15-15	Självstudier inför seminarium Sediment och sedimentbergarter		-	Självst.
		15.15-17	Seminarium 4: Sediment och sedimentbergarter		243	MC
Lör	**25/9**		**Geologins dag**			
Mån	27/9	09.15-12	Laboration B: Sediment	2	147	LB/EE
		13.15-16	Laboration B: Sediment	1	147	LB/EE
Tis	28/9	09.15-12	Självstudier inför seminarium Klimat-förändringar under kenozoikum		-	Självst.
		13.15-15	Seminarium 5: Klimatförändringar under kenozoikum		243	BS
Ons	29/9	10.15-12	Föreläsning 9: Klimatet före kvartär		243	BS
		13.15-16	Föreläsning 10: Kvartärtidens klimatförändringar och dess orsaker		243	SB
Tor	30/9	09.00-17	Fältdag		*	BS
Fre	1/10	09.15-12	Föreläsning 11: Kvartära avlagringar		243	LB
		13.15-16	Självstudier inför seminarium Kvartärtidens klimatförändringar och dess orsaker		-	Självst.
Mån	4/10	09.15-12	Övning C	2	243	LB
		09.15-12	Självstudier inför seminarium Kvartära avlagringar	1	-	Självst.
		13.15-16	Övning C	1	243	LB
		13.15-16	Självstudier inför seminarium Kvartära avlagringar	2	-	Självst.
Tis	5/10	08.15-17	Fältdag: Senkvartär geologi		*	LB
Ons	6/10	10.15-12	Kartövning	2	243	LB
		13.15-15	Kartövning	1	243	LB
Tor	7/10	09.15-12	Självstudier inför seminarium Kvartärtidens klimatförändringar och dess orsaker		-	Självst.
		13.15-17	Seminarium 6: Kvartärtidens klimat samt film och diskussion		243	SB
Fre	8/10	10.15-12	Seminarium 7: Kvartära avlagringar		243	LB
		13.15-15	Föreläsning 12: Paleogeografi och havsnivåer		243	SB
Mån	11/10	10.15-12	Föreläsning 13: Fossil och livets utveckling		243	PA
		13.15-17	Självstudier inför seminarium		-	Självst.
Tis	12/10	10.15-12	Seminarium 8: Stratigrafi och livets utveckling		243	PA
		13.15-16	Föreläsning 14: Den fossilförande lagerserien		243	PA
Ons	13/10	09.15-12	Självstudier inför seminarium		-	Självst.
		13.15-15	Seminarium 9: Den fossilförande lagerserien		243	PA
Tor	14/10	09.15-12	Övning D	1	243	PA
		09.15-12	Självstudier inför seminarium Paleogeografi och havsnivåer	2	-	Självst
		13.15-16	Övning D	2	243	PA

		13.15-16	Självstudier inför seminarium Paleogeografi och havsnivåer	1	-	Självst
Fre	15/10	10.15-12	Seminarium 10: Paleogeografi och havsnivåer		243	SB
Mån	18/10	13.15-15	Föreläsning15: Djur och växter under kvartärtiden		243	LB
Tis	19/10	09.15-12 13.15-15 15.15-16	Förberedelse för seminarium Djur och växter Seminarium 11: Djur och växter Film och diskussion		- 243 243	Självst. LB LB
Ons	20/10	08.15-18	Fältdag på egen hand. Transporterna börjar 08.15 enl. särskild grupplista, ej labgrupper. Transporter US.		*	US
Tor	21/10	08.15-16	Bearbetning av eget fältarbete		-	
Fre	22/10	09.15-12 13.15-15	Föreläsning 16: Radiogena isotoper, kortlivade **Temaföreläsning Raimund Muscheler: "***How trees and polar ice provide information about the Sun's past and the link to climate change*"		243 243	GS RM
Mån	25/10	08.15-16	Bearbetning av eget fältarbete		-	
Tis	26/10	08.15-16	Bearbetning av eget fältarbete		-	
Ons	27/10	08.15-12	Bearbetning av eget fältarbete. **Inlämning senast kl 12.00**		-	
Tor	28/10		Undervisningsfritt			
Fre	29/10	Förmiddag 13.15-16	Genomgång av fältrapporter enligt särskild tidlista. Bearbetning icke godkända fältrapporter		243 243	US/LB/ PA
Mån	1/11	10.15-12	Diskussion, kursavslutning, utvärdering		243	US/LB/PA/ SB (övriga lärare fri-villigt)

Vid fältdagar och exkursioner samling i foajén vid stora entrén om inget annat angetts.

På fältdagar och exkursioner kör vi från institutionen 15 min efter angiven starttid utan dröjsmål. Kom i tid enligt schemat, eftersom utrustning ofta måste hanteras innan avfärd. Har Du blivit försenad, ring läraren eller Margaretha (046/2227865) för att kolla om vi kan vänta på Dig.

All undervisning i sal, laborationer och övningar börjar prick enligt schemat.

*** Sal 220 Biosfären 20/9 kl 9-12, GeoCentrum I**

Litteraturlista för GEOA01 Geologi: Planeten Jorden – en introduktion
15 högskolepoäng

(Geology: Planet Earth – an introduction, 15 ECTS credits)

Fastställd av institutionsstyrelsen den 7 juni 2007, reviderad 22 maj 2008

Författare & titel (ev. tidskrift, serie, etc.)	***B,I,L (*)***	**Sidor som skall läsas, Anmärkning (**)**
Marshak, Stephen 2007: Earth: portrait of a Planet. 3:e uppl. 896 sid. W.W. Norton & Company, Inc. ISBN 9780393111378 (paperback)	B/L	
Andréasson, P.-G. (red.) 2006: Geobiosfären – en introduktion. 604 sid. Studentlitteratur. ISBN 9144036701	B	
Åhörarkopior och andra papperskopior som delas ut under kursen. Kostnaderna för dessa betalas vid kursstart till Margaretha Kihlblom på studerandeexpeditionen för geologi.		

*B = finns att köpa i bokhandel
*I = finns att köpa på institutionen
*L = kan lånas på Geobiblioteket
** = om inget anges läses boken i sin helhet

Appendix IV

GEOA01
Kursplan för Geologi: Planeten Jorden – en introduktion 15 högskolepoäng,
Geology: Planet Earth – an introduction 15 ECTS credits

1. Grundläggande uppgifter
Fastställd av naturvetenskapliga fakultetens utbildningsnämnd 2007-01-31 . Planen träder i kraft 2007-07-01. Kursen är på grundnivå.

2. Allmänna uppgifter
Kursen ingår i huvudområdet geologi vid den naturvetenskapliga fakulteten. Kursen är en obligatorisk kurs på grundnivå för en naturvetenskaplig kandidatexamen i geologi. Kursen ges även som fristående kurs. Kursen ges på svenska.

3. Lärandemål
Kursens mål är att studenter efter avslutad kurs skall ha förvärvat följande kunskaper och färdigheter; de skall

- kunna beskriva Jordens uppbyggnad och sammansättning,
- kunna redogöra för processer som styr bergskedjors och oceaners bildning och försvinnande, vulkanism, jordskalv, nedisningar, storskaliga klimat- och havsnivåförändringar samt bildning av olika typer av sediment och landformer,
- kunna översiktligt redogöra för Jordens historia, den geologiska tidsskalan, livets utveckling samt den geovetenskapliga metodik som kunskapen baseras på,
- känna till våra viktigaste geologiska naturresurser och kunna diskutera geologins roll i samhället,
- ha utvecklat färdigheter i självstudieteknik, presentationsteknik och rapportskrivning.

4. Kursinnehåll
Kursen omfattar fem teman, och flera av dessa teman ingår i den fältbaserade delen av undervisningen:

Jordens uppkomst och uppbyggnad – Hur planeten har bildats, dess uppbyggnad och tidiga historia, samt mineral- och bergartsbildande processer.
Jordens förändring – Jordens plattrörelser och deras betydelse för bergskedjebildning, vulkanism, jordskalv och havsnivåförändringar.
Klimatet – Klimatets förändringar med nedisningar och växthuseffekter utifrån olika tidsperspektiv och processer.
Sedimenten – Vittring, erosion, transport och sedimentation i marina och kontinentala miljöer samt landskapets utveckling. Sedimentära berg- och jordarter och deras klassifikation.
Livets utveckling – Växters och djurs utvecklingshistoria och indelning. Fossil, deras bildning, förekomst och roll inom geologin.

Två moment är integrerade inom ovannämnda teman:
Geologiska naturresurser och geologin i samhället samt *den geologiska tidsskalan och dateringsmetoder.*

5. Undervisning och examination
Undervisningen utgörs av föreläsningar och litteraturseminarier, exkursioner, fältövningar, laborationer, gruppövningar och projektarbeten. Deltagande i seminarier, exkursioner, fältövningar, laborationer, gruppövningar och projektarbeten och därmed integrerad annan undervisning är obligatoriskt.

Examination sker genom aktivt deltagande i seminarier samt genom bedömning av projektrapporter.

För studerande som ej godkänts ges möjlighet till skriftlig examination och komplettering av projektrapporter.

6. Betyg
Betygsgraderna på kursen är godkänd och underkänd.

För godkänt betyg på hela kursen krävs godkända projektrapporter samt deltagande i alla obligatoriska moment.

Slutbetyget avgörs genom en sammanvägning av resultaten på de moment som ingår i examinationen.

7. Förkunskapskrav
För tillträde till kursen krävs grundläggande behörighet samt Matematik D, Fysik A, Kemi A och Biologi B.

8. Litteratur
Enligt fastställd litteraturlista, vilken skall finnas tillgänglig på kursens hemsida (www.geol.lu.se) senast fem veckor före kursstart.

9. Övriga anvisningar
Kursen kan inte tillgodoräknas i examen tillsammans med GEL301 Planeten Jorden – en introduktion, 10 poäng.

Appendix V

Självvärdering vid HSV-utvärdering av projektet Geovetenskap och kulturgeografi

Här kommer Geobibliotekets, vid Lunds universitet, bidrag till utbildningen inom Geologi (geovetenskap) på kandidat respektive mastersnivå.

Kandidatexamen:

Inom grundprogrammet får studenterna biblioteksundervisning i två steg:

I *steg ett* lär studenterna känna universitetsbibliotekets organisation. De lär sig också känna de grundläggande bibliotekskatalogerna och referensdatabaserna samt hur man söker i dessa. I momentet ingår också grundläggande kunskaper i referenshantering, såsom källhänvisningar litteraturförteckningar. Biblioteksundervisningen ges tillsammans med en lärare och en bibliotekarie kopplas till en uppgift som studenterna skall lösa dels på egen hand, dels i seminarieform.

I steg två delges studenterna skillnaderna mellan olika typer av databaser, såsom bibliografiska databaser och faktadatabaser. De får också en fördjupad förståelse för sökteknik samt tränar upp sin förmåga att formulera sökbegrepp och kombinera dessa i söksträngar för fält- och fritextsökningar. De övar också upp sina färdigheter att bedöma relevansen av de i träfflistor framkomna referenserna. Biblioteksundervisningen ges tillsammans med en lärare och en bibliotekarie. Studenterna får en individuell skrivuppgift som de skall lösa på egen hand. I samband med skrivuppgiften får studenterna öva upp sin förmåga att upprätta en litteraturlista enligt det system som används inom ämnesområdet.

Mastersexamen:

På mastersnivån får studenterna undervisning i ett tredje, sista, steg:

I steg tre tar studenterna ytterligare ett steg på vägen att effektivisera sin referenshantering genom att använda sig av ett datorbaserat referenshanteringsprogram. Här trimmas deras kunskaper dessutom i informationssökning och databashantering, eftersom ett referenshanteringsprogram förutsätter dessa båda förmågor. Studenterna får också kännedom om forskningens publiceringsvägar, kvalitetsranking av tidskrifter samt hur man kan bevaka sitt ämnesområde via olika aviseringssystem.