Stockholm University

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Study guide

Early Childhood Education: Focusing Mathematics and Technology, 12 credits, Full time studies

Course code: UB314F

Spring semester, 2025, April 7th until June 9th 2025

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Welcome!

Hello everyone and a big welcome to the course, “Early Childhood Education: Focusing Mathematics and Technology”. In this study guide, you will find information about the course, course literature along with other details of a practical nature.

All courses at the Department of Child and Youth Studies have their own course website, where you will find all the information you need regarding the course; as e.g., the course syllabus, schedule, course literature and study guide. You can find the course web site here: www.su.se/coursecatalogue/UB314F

This course will also be using Stockholm University's common digital collaboration and learning environment ATHENA https://Athena.su.se/portal as a means of collective communication. On registering onto the course, you will be able to log onto the Athena course site with your university username and password, browsing for the course code.

The course is a full-time course for eight weeks of study between April 7th until June 9th. The course is taught by a team of lecturers: Anna Günther-Hanssen, Petra Petersen, and Sara Ohlin (Department of Child and Youth Studies, BUV), Lovisa Gustafsson and Linda Öhlund (Department of Teaching and Learning, IÄD).

Literature

The course literature is listed on the course website, and in the end of this Study Guide. In addition, recommended reading before lectures, seminars and workshops is presented via Athena in the beginning of the course.

The reference system used in the course follows the Harvard system.

Information and guide in English language: Please follow the manual for the Harvard reference system. A more brief description is available at: Harvard - writing a reference list (umu.se) while a more detailed (and helpful) guide to the Harvard reference guide can also be found here Harvard Referencing Style Guide (ucd.ie) As you use references in your written exams, it is important that you, except from the authors name(s) and year always also add the page number. In all written examinations in the requirement is that the reference handling must be essentially correct in order to achieve a passing grade.

Information and guide in Swedish language: I denna kurs används Harvardsystemet för referenshantering. Följ Borås-guidens hänvisningar. I guiden (3.1.1.) står att praxis när det gäller sidor i texthänvisningen varierar inom olika ämnesområden. För kurser inom Förskollärarprogrammet gäller att både citat och referat anges med sidhänvisning. I alla skriftliga examinationer inom Förskollärarprogrammet är kravet att referenshanteringen ska vara i huvudsak korrekt för att uppnå godkänt betyg. Guide till harvard-systemet Guide till Harvardsystemet - Högskolan i Borås (hb.se)

Additional information

Other important information about being a student at Stockholm can be found at the following web site: https://www.su.se/english/education/new-student

Evaluation

Students are invited to participate in discussions about the course and are free to bring up suggestions for changes during the course. An on-line evaluation form will be distributed to all students in the end of the course.

Early Childhood Education: Focusing Mathematics and Technology

Course content

This course provides an introduction to the field of mathematics and technology in preschool. It covers both children's and students' own relationships to mathematics and technology, as well as mathematics and technology in relation to norms in society. The course considers children's mathematical activities and exploration in their daily lives. In the course mathematics is understood as language and is studied using an exploratory approach, practical-aesthetic expression, play and dance. The course content is discussed in relation to the task of the preschool teacher and the objectives of the curriculum as well as different learning theories and knowledge traditions in relation to mathematics and technology.

Course structure

[Course module: Early Childhood Education perspective on Mathematics and Technology (part 1), 8 credits]

The module gives an introduction to mathematics and technology in preschool from an Early Childhood Education perspective, it covers:

- mathematics and technology in preschool education — teaching and learning,
- an exploratory approach in relation to mathematics and technology,
- practical-aesthetic learning processes and play in relation to Early Childhood Education focusing mathematics and technology,
- learning theories and knowledge traditions in relation to mathematics, technology and norms in society.

Learning outcomes

In order to pass the course module Early Childhood Education perspective on Mathematics and Technology, 8 credits students are expected to be able to:

- account for how pedagogical strategies, practical-aesthetic learning processes and play in different teaching situations can contribute to support children's learning in mathematics and technology,

- demonstrate knowledge of children's learning, the role of the preschool teacher and the importance of the educational environment in Early Childhood Education focusing mathematics and technology,

- demonstrate knowledge of an exploratory approach in relation to the subject areas of mathematics and technology where concrete situations form the basis for children's learning,

- account for the relationship between observable mathematical and technical phenomena in preschool in relation to abstract explanations of mathematics and technology,

- reflect on how the preschool teacher's perspective on knowledge and learning as well as society's norms can constitute opportunities and obstacles for children's learning in mathematics and technology,

- account for different theoretical perspectives and their didactic consequences in relation to mathematics and technology.

[Course module: Early Mathematics and Aesthetic Expressions (part 2), 4.0 credits]

From a subject didactic perspective, the module provides an introduction to mathematics in preschool, it deals with:

- early mathematical concepts and activities,

- the mathematical areas: space, shape, position, direction, quantity, number, order, number concepts, measurement, time and change,

- how children's play, exploration of signs, symbols and other expressions as well as aesthetic expressions are important for mathematical learning,

- practical-aesthetic learning processes and play in relation to mathematics in preschool.

Learning outcomes

In order to pass the course module Early Mathematics and Aesthetic Expressions, 4 credits students are expected to be able to:

- account for children's early mathematical learning in preschool,

- demonstrate the ability to plan, apply and review mathematics education work in preschool,

- stage practical-aesthetic learning situations and play in relation to mathematics in preschool.

Education

Instruction is given in the form of lectures, seminars, workshops/laboratory work, individual assignments and group assignments, as well as via the university's virtual learning environment.

Schedule

Please see the course web site: www.su.se/coursecatalogue/UB314F

Examination dates

- PART 1: Individual paper focusing on mathematics and technology (8 credits) – uploaded on ATHENA in the assignment folder no later than [2025-06-09] at 17.00.

- PART 2: Individual written assignment and oral presentation of the individual written assignment during seminar "Outdoors" (4 credits).

  The assignment will be introduced during the seminar 2025-04-23.

  - A first version of the individual written assignment should be uploaded on ATHENA in the assignment folder no later than [2025-05-02] at 17.00.
  - Feedback on a fellow student's assignment should be submitted via Athena no later than [2025-05-12] at 17.00.
  - Oral presentation of the individual written assignment during seminar "Outdoors" 2025-05-14.
  - A final version – after feedback - should be uploaded on ATHENA in the assignment folder no later than [2025-05-23] at 17.00.

The examinations are presented in more detail in a document that you will find at Athena in the resources folder later on during the course.

Attendance

All seminars, workshops and study visits are mandatory. In case of absence, contact the teacher of that particular course content. Make-up assignment will be accessed on Athena after the seminar in question has been implemented.

Make-up assignments should be uploaded on ATHENA in the assignment folder no later than [2025-06-09] at 17.00.

In case of absence from the oral presentation of the individual written assignment during seminar "Outdoors" 2025-05-14 contact the lecturer Linda Öhlund no later than 2025-05-23 for further instructions.

Plagiarism and regulations for disciplinary matters

As a student you have to be conscientious about clearly accounting for the material used in the texts that are submitted for examination. To use other people's expressions or ideas without stating where they are from is plagiarism. To translate and/or change some words in someone else's text and present it as one's own is obviously also a form of plagiarism. The teachers in the course may use the web-based tool Ouriginal to check your text for plagiarism.

Plagiarism is considered to be cheating and if discovered in an exam or paper, the exam or paper will immediately be failed and disciplinary measures may be taken. Any student who is caught cheating or disrupting academic activities can be suspended from lectures and exams for a period of up to six months. The Vice-Chancellor or the Disciplinary Council decides whether the student is to be subject to any disciplinary measures.

Other people's texts can include course literature, essays, or exam assignments, as well as texts you have found online, or texts created with the help of AI/a chatbot. If you have used a chatbot to write your text but make it seem as if you wrote the text yourself, it is considered plagiarism.

https://www.su.se/department-of-child-and-youth-studies/education/during-your-studies/plagiarism-cheating-and-self-plagiarism-1.552459

Grade for the whole course

To get a grade for the whole course, all examinations must be finished with at least the grades G or E. The grade for the whole course is based on the grade of PART 1: Individual paper focusing on mathematics and technology (8 credits)

Re-examination and Fail

A student who has received a grade of E or higher may not take a re-examination for a higher grade. In addition, a registered passing grade may not be altered to Fail.

The next opportunity for re-examination will take place the [2025-08-08]. Students who want to re-take the examination shall contact the course administrator at the latest the [2025-07-01].

The assignments will be the same and must be handed in on the Athena page no later than [2025-08-08] at 17.00.

A student who receives the grade Fx once has the possibility of complementing the exam [2025-08-08] at 17:00. If improvements are not done in the time allotted, the student is required to retake the examination.

A student who receives the grade F once has the possibility of complementing the exam [2025-08-08] at 17:00. If improvements are not done in the time allotted, the student is required to retake the examination

A student who did not hand in the exam at the ordinary deadline has the opportunity to hand it [2025-08-08]. If improvements are not done in the time allotted, the student is required to retake the examination

A student who has received the grade of F, Fx or U twice on a given examination and by the same examiner may apply and be granted a new examiner. The application should be addressed to the director of studies.

Literature

Course within the Section for Early Childhood Education.

Titles marked with * can be found electronically, either at su.se/stockholm-university-library or open on the internet.

Titles marked with ** are available as PDF-files at the courses site on Athena.

Course literature

* Björklund, C. & Palmér, H. (2024). The challenges of mathematizing in Swedish early childhood education. *Journal of Early Childhood Education Research* 13(2), pp. 167-186. https://doi.org/10.58955/jecer.138122 (19 p.)

* Carruthers, E. & Worthington, M. (2006). *Children's Mathematics: Making Marks, Making Meaning,* 2nd ed. Sage publications, (64 p.) Reading instruction: pp. 1-55; 229-

235.

Clements, D H. & Sarama, J. (2020). *Learning and Teaching Early Math: The Learning Trajectories Approach*. 3 rd ed., Routledge. (270 p.) Reading instruction: pp. 18-278, 338-348.

* Cross, C T., Woods, T A. & Schweingruber, H.(eds.) (2009). *Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity*. National Academies Press. (64 p.) Reading instruction: pp. 21-85.

* Fleer, M. (2021). When preschool girls engineer: Future imaginings of being and becoming an engineer. *Learning, Culture and Social Interaction*, 30(Part B): 1-13. https://doi.org/10.1016/j.lcsi.2019.100372 (13 p.)

* Franzén, K. (2015). Under threes' mathematical learning. *European Early Childhood Education Research Journal*, 23(1), pp. 43-54. https://doi.org/10.1080/1350293X.2014.970855 (12 p.)

* Franzén, K. (2015). Being a tour guide or travel companion on the children's knowledge journey. *Early Child Development and Care*, 185(11-12), pp. 1928-1943. https://doi.org/10.1080/03004430.2015.1028401 (16 p.)

** Helenius, O., Johansson, M. L., Lange, T., Meaney, T., Riesbeck, E., & Wernberg, A. (2014). *Preschool Teachers' Awareness of Mathematics.* Proceedings of MADIF 9: NCM. (10 p.)

* Palmer, A. (2009). 'I'm not a "mathsperson"!' Reconstituting mathematical subjectivities in aesthetic teaching practices. *Gender and Education*, 21(4), pp. 387-404. https://doi.org/10.1080/09540250802467950 (13 p.)

* Palmer, A. (2010). 'Let's Dance!' Theorising Alternative Mathematical Practices in Early Childhood Teacher Education. *Contemporary Issues in Early Childhood*, 11(2), pp. 130-143. https://doi.org/10.2304/ciec.2010.11.2.130 (13 p.)

* Palmer, A. (2016). 'Is this the tallest building in the world?' A posthuman approach to ethical problems in young children's learning projects. *Global Studies of Childhood* 6(3), pp. 283-298. https://doi.org/10.1177/2043610616665035 (15 p.)

* Sundqvist, P. (2022). Characterizations of preschool technology education: analyses of seven individual preschool teachers' and childcare attendants' descriptions of their

teaching. *International journal of Technology and Design Education* 32(2). pp. 2003–2018. https://doi.org/10.1007/s10798-021-09678-2 (15 p.)

Additional course literature such as articles, reports etc. as assigned by the teacher (approximately 150 pages)

Government agency references

National Agency of Education. (2018). *Curriculum for the preschool Lpfö 98, revised 2018*. (21 p.)