កម្មវិធីសិក្សាលម្អិត

សម្រាប់បណ្ដុះបណ្ដាលគ្រូបង្រៀនកម្រិតបឋមសិក្សា
នៅវិទ្យាស្ថានគរុកោសល្យ

ថ្នាក់បរិញ្ញាបត្រអប់រំ (១២+៤)

ឯកទេស បច្ចេកវិទ្យាសម្រាប់ការរៀន

(ឆ្នាំទី២)

ឆ្នាំ ២០២០

បច្ចុប្បន្នក្រសួងអប់រំ យុវជន និងកីឡានិងអ្នកពាក់ព័ន្ធកំពុងយកចិត្តទុកដាក់អនុវត្តឯកសារគតិយុត្តិនិងយន្តការ ក្នុងការអភិវឌ្ឍសមត្ថភាពគ្រូបង្រៀន។ ដោយអនុលោមតាមយុទ្ធសាស្ត្រទី៦ ស្តីពី «ការអភិវឌ្ឍសមត្ថភាពវិជ្ជាជីវៈគ្រូបង្រៀនក្នុងពេលបម្រើការងារ» នៃឯកសារផែនការសកម្មភាពគោលនយោបាយស្តីពី គ្រូបង្រៀន។

ក្រសួងអប់រំ យុវជន និងកីឡាបានសហការជាមួយអង្គការ VVOBកសាងឯកសារ "ការអភិវឌ្ឍវិជ្ជាជីវៈគ្រូបង្រៀន" សំដៅលើកកម្ពស់សមត្ថភាពគ្រូឧទ្ទេសនិងគ្រូបង្រៀនឱ្យស្របតាមស្តង់ដារវិជ្ជាជីវៈគ្រូបង្រៀន។ ឯកសារនេះបរិយាយអំពី ប្រព័ន្ធ និងយុទ្ធវិធីអភិវឌ្ឍវិជ្ជាជីវៈគ្រូឧទ្ទេសនៅនឹងកន្លែង។

ឯកសារស្តីពីការអភិវឌ្ឍវិជ្ជាជីវៈគ្រូឧទ្ទេសបានរួមចំណែកក្នុងការអនុវត្តគន្លងអាជីពគ្រូបង្រៀនដើម្បីលើកកម្ពស់គុ ណភាពអប់រំ ជាពិសេសគុណភាពនៃការបណ្ដុះបណ្ដាលគ្រូបង្រៀននៅកម្ពុជា។ ដើម្បីឱ្យការអនុវត្តឯកសារនេះប្រកប ដោយគុណភាព ក្រសួងអប់រំ យុវជន និងកីឡា សូមឱ្យ លោកគ្រូ អ្នកគ្រូ និងគ្រូឧទ្ទេសទាំងអស់ធ្វើការសិក្សាស្រាវជ្រាវ ឱ្យបានល្អិតល្អន់និងអនុវត្តឱ្យបានសុីជម្រៅជាក់ស្តែងនៅតាមមូលដ្ឋានរបស់ខ្លួន។

ជាទីបញ្ចប់ក្នុងនាមក្រសួងអប់រំ យុវជន និងកីឡា ខ្ញុំសូមថ្លែងអំណរគុណយ៉ាងជ្រាលជ្រៅចំពោះអង្គការ VVOB ក្រុមការងារ និងអ្នកពាក់ព័ន្ធទាំងអស់ ដែលបានយកអស់ពីកម្លាំងកាយចិត្ត និងប្រាជ្ញាស្មារតី ក្នុងការកសាងឯកសារដ៏មានសារៈសំខាន់នេះ។

<div align="center">

រាជធានីភ្នំពេញ ថ្ងៃទី...........ខែ.............ឆ្នាំ២០២០

រដ្ឋមន្ត្រីក្រសួងអប់រំ យុវជន និងកីឡា

</div>

អារម្ភកថា

កម្មវិធីសិក្សាលម្អិត **បច្ចេកវិទ្យាសម្រាប់ការរៀន** សម្រាប់អប់រំគ្រូបង្រៀនកម្រិតបឋមសិក្សា ថ្នាក់បរិញ្ញាបត្រ (១២+៤)សម្រាប់ឆ្នាំទី២ ត្រូវបានរៀបចំឡើងដោយមន្ត្រីអប់រំរបស់ក្រសួងអប់រំ យុវជន និងកីឡាមកពីនាយកដ្ឋាននានា ក្រោមឱវាទក្រសួង សាកលវិទ្យាល័យ វិទ្យាស្ថានជាតិអប់រំ រួមជាមួយដៃគូអភិវឌ្ឍដូចជាអង្គការ JICA/E-TEC អង្គការ VVOB និងផ្សេងទៀត។

ខ្លឹមសារនៅក្នុងកម្មវិធីសិក្សាលម្អិតនេះរួមមានកម្មវិធីសិក្សាលម្អិតសម្រាប់ឆ្នាំសិក្សាទី២ ដែលមានទាំងចំណងជើង មេរៀន និងវិធីសាស្ត្របង្រៀនស្នើសម្រាប់អនុវត្តការរៀនតាមបែបបច្ចេកវិទ្យា តាមសប្តាហ៍ នីមួយៗ។ កម្មវិធីសិក្សានេះ គឺជា   ឯកសារដ៏សំខាន់របស់វិទ្យាស្ថានគរុកោសល្យ ដែលសាស្ត្រាចារ្យខទ្ទេសអាចយកទៅប្រើប្រាស់ក្នុងកម្មវិធីបណ្ដុះបណ្ដាល   គ្រូបង្រៀនប្រកបដោយប្រសិទ្ធភាព និងទទួលបានលទ្ធផលល្អ។

ក្រុមការងារយើងខ្ញុំសូមថ្លែងអំណរគុណចំពោះថ្នាក់ដឹកនាំក្រសួងអប់រំ យុវជន និងកីឡា ដែលបាន ជួយឧបត្ថម្ភ គាំទ្រក្នុងការអភិវឌ្ឍកម្មវិធីសិក្សាដ៏មានតម្លៃនេះ។ យើងខ្ញុំទាំងអស់គ្នា នឹងបន្តខិតខំកែលម្អកម្មវិធីសិក្សានេះបន្ថែមទៀត ដើម្បីឲ្យការអប់រំគ្រូបង្រៀននៅវិទ្យាស្ថានគរុកោសល្យកាន់តែមានគុណភាពប្រសើរឡើង។

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គណៈកម្មការមុខវិជ្ជា ICT

</div>

<p style="text-align:center">គណៈកម្មការរៀបចំកម្មវិធីសិក្សាលម្អិត</p>

គណៈកម្មការគ្រប់គ្រង

1. ឯ.ឧ. បណ្ឌិតសភាចារ្យ ហាង ជូន ណារ៉ុន រដ្ឋមន្ត្រីក្រសួងអប់រំ យុវជន និងកីឡា	ប្រធាន
2. ឯ.ឧ. បណ្ឌិតសភាចារ្យ ណាត ប៊ុនរឿន រដ្ឋលេខាធិការក្រសួងអប់រំ យុវជន និងកីឡា	អនុប្រធាន
3. ឯកឧត្តម ហ៊ាង ស៊ុំណែ អនុរដ្ឋលេខាធិការក្រសួងអប់រំ យុវជន និងកីឡា	សមាជិក
4. ឯកឧត្តម លាង សេងហាក់ អនុរដ្ឋលេខាធិការក្រសួងអប់រំ យុវជន និងកីឡា	សមាជិក
5. ឯកឧត្តម ពុត សាមិត្ត អគ្គនាយកអប់រំ	សមាជិក

គណៈកម្មការបច្ចេកទេស

1. ឯ.ឧ. បណ្ឌិតសភាចារ្យ ណាត ប៊ុនរឿន រដ្ឋលេខាធិការក្រសួងអប់រំ យុវជន និងកីឡា	ប្រធាន
2. ឯកឧត្តម ហ៊ាង ស៊ុំណែ អនុរដ្ឋលេខាធិការក្រសួងអប់រំ យុវជន និងកីឡា	អនុប្រធាន
3. ឯកឧត្តម លាង សេងហាក់ អនុរដ្ឋលេខាធិការក្រសួងអប់រំ យុវជន និងកីឡាសមាជិក	អនុប្រធាន
4. ឯកឧត្តម ពុត សាមិត្ត អគ្គនាយកអប់រំ	អនុប្រធាន
5. ឯកឧត្តម អ៊ុក សិទ្ធិជាតិ អគ្គនាយកកីឡា	សមាជិក
6. ឯកឧត្តម ជេត ជាលី សាកលវិទ្យាធិការនៃសាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ	សមាជិក
7. លោកបណ្ឌិត ខី សមស៉ុដែក អគ្គនាយករងអប់រំ	សមាជិក
8. លោកបណ្ឌិត ម៉ុក សារ៉ុម អគ្គនាយករងអប់រំ	សមាជិក
9. លោកស្រីបណ្ឌិត យួន វិច្ឆិកា អគ្គនាយករងអប់រំ	សមាជិក
10. លោកបណ្ឌិត សំអោ អង្គារតន៍ អគ្គនាយករងប.ផក	សមាជិក
11. លោក ង៉ា ប៉េងឡុង ប្រធាននាយកដ្ឋានបវ	សមាជិកប្រចាំការ
12. លោកបណ្ឌិត សុខ ស្បូត្រ ព្រឹទ្ធបុរសនៃសាលាករវិទ្យាល័យភូមិន្ទភ្នំពេញ	សមាជិក
13. លោកលោកបណ្ឌិត សិត សេង នាយកវិទ្យាស្ថានគរុកោសល្យរាជធានីភ្នំពេញ	សមាជិក
14. លោក ជុំ សុផល នាយកវិទ្យាស្ថានគរុកោសល្យបាត់ដំបង	សមាជិក

គណៈកម្មការមុខវិជ្ជាឯកទេស ICT

1. លោក ថ្លៃ ហាង ព្រឹទ្ធបុរសរងនៃវិទ្យាស្ថានបច្ចេកវិទ្យាកម្ពុជា	ប្រធាន
2. លោក លោក កែល ភារុន អនុប្រធាននាយកដ្ឋានបច្ចេកវិទ្យាព័ត៌មានវិទ្យា	អនុប្រធាន
3. លោក គី សុខហេង នាយករងវិទ្យាស្ថានគរុកោសល្យបាត់ដំបង	អនុប្រធាន
4. លោក ជី គួង ប្រធានដេប៉ាតីម៉ង់ព័ត៌មានវិទ្យានៃសាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ	អនុប្រធាន
5. លោក អ៊ុក សម្ពស្ស ប្រធានការិយាល័យនៃនាយកដ្ឋានបច្ចេកវិទ្យាព័ត៌មានវិទ្យា	សមាជិក
6. លោក ធូ ចំរើន សាស្ត្រាចារ្យនៃសាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ	សមាជិក
7. លោក ដាន រ៉ុនផេង សាស្ត្រាចារ្យនៃសាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ	សមាជិក
8. លោក ខៀវ សុក័ត្រា សាស្ត្រាចារ្យនៃសាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ	សមាជិក
9. លោក ឈុន វិទ្ធី មន្ត្រីនាយកដ្ឋានបណ្ណៈបណ្ណាល័យ និងវិក្រឹតការ	សមាជិក
10. លោក យាង ប៉េងលី គ្រូខទ្ទេសនៃវិទ្យាស្ថានជាតិអប់រំ	សមាជិក
11. លោក ជ សុភា ប្រធានដេប៉ាតីម៉ង់ICTនៃវិទ្យាស្ថានគរុកោសល្យរាជធានីភ្នំពេញ	សមាជិក

12. លោក ជួង សុវណ្ណតារា អនុប្រធានដេប៉ាតឺម៉ង់ICTនៃវិទ្យាស្ថានគរុកោសល្យរាជធានីភ្នំពេញ សមាជិក

13. លោក កែវ ទូច អនុប្រធានដេប៉ាតឺម៉ង់ICTនៃវិទ្យាស្ថានគរុកោសល្យរាជធានីភ្នំពេញ សមាជិក

14. លោក ម៉េង សុខជា គ្រូខទ្ទេសនៃវិទ្យាស្ថានគរុកោសល្យរាជធានីភ្នំពេញ សមាជិក

15. លោក ដុះ សំអាន គ្រូខទ្ទេសនៃវិទ្យាស្ថានគរុកោសល្យបាត់ដំបង សមាជិក

16. លោក ណុប តារាវ៉ុធ គ្រូខទ្ទេសនៃវិទ្យាស្ថានគរុកោសល្យបាត់ដំបង សមាជិក

17.លោក ហាង ឡាលីន គ្រូខទ្ទេសនៃវិទ្យាស្ថានបច្ចេកវិទ្យាកម្ពុជា សមាជិក

18.លោក គីម យ៉ុណេង គ្រូខទ្ទេសនៃវិទ្យាស្ថានបច្ចេកវិទ្យាកម្ពុជា សមាជិក

19.លោក ហ្នុត ស៊ាងហៃ គ្រូបង្រៀនសាលាជំនាន់ថ្មី សមាជិក

20.លោក ឈុន ធៃយុទ្ធ គ្រូបង្រៀនសាលាជំនាន់ថ្មី សមាជិក

21. លោក អៀង ទិត្យា មន្ត្រីនាយកដ្ឋានធានាគុណភាពអប់រំ សមាជិក

4

Technology for meaningful learning

I. General information

Category	Curriculum Study
Lecturer	Name: ************ Email: ************
Room	Room *****, Building *****
Student Teachers	2nd year of Primary Education Programme
Semester	Semester 1: 15 classes (2 hours ×15 weeks) Meaningful learning with technologies Semester 2: 15 classes (2 hours ×15 weeks) Pedagogies for Meaningful learning with technologies
Date	November 2019 – August 2020
Credits	2(0-2)

II. Module Description

Currently there are many information and applications on the World Wide Web that are beneficial to teachers. Teachers need to know where useful information sources are. It is also increasingly required that teachers participate in professional learning community and think about how to utilize ICT for educational activities in collaboration.

Firstly, this course provides preservice student teachers with strategies to promote meaningful learning with the use of technology in learning environments. Preservice student teachers will design meaningful technology-enabled activities and develop materials by referring to appropriate digital resources for implementation in the Cambodia classrooms through the whole class. They will also design activities that teach learners to be astute in using the Web by taking appropriate measures in ensuring cyber wellness. Moreover, they will evaluate technological tools that support teaching, learning, and assessment. Preservice student teachers will be introduced the concepts and applications of cognitive tools with emphasis for use in local context. When ICT tools are used as cognitive and constructive tools, they help to provide meaningful learning by extending the human cognition for learning and engendering conducive learning conditions. The experience and exposure gained in this course will help them integrate technologies appropriately into meaningful learning activities. Preservice student teachers are expected to work in pairs or groups on activities that employ cognitive and constructive tools.

Secondary this course provides an overview of the use of Information and Communication Technology (ICT) in making teaching and learning materials according to the idea of Instructional Design and Learning Science. In addition, this lecture also guarantees the opportunity to create materials of high quality by actually creating teaching and learning materials according to the purpose using the application, and by evaluating the teaching materials with each other. Preservice teachers will possess competencies in application of ICT for making and evaluating materials effectively.

III. Module Objectives

After the study of this module, preservice students will be able:

- CLO 1: Identify resources, technology, and technology tools online used in teaching and learning (PLO2)
- CLO2: Use data through information and communication technology to support effective teaching and learning and professional ethics (PLO12)
- CLO3: Use information and communication technology tools to support teaching and learning in response to education in the digital age (PLO11)

IV. Methodology

- Lecture
- Practice
- Group Discussion
- Individual Presentation

V. Assessment (assignment, assessment criteria, hand-in date)

Preservice students will be evaluated comprehensively based on class attendance, contribution in class, report and performance in accordance with the assessment criteria.

No.	Assessment	Assessment criteria
1	Class attendance (10%)	More than 80 % of class attendance in each semester is prerequisite to submit assignments or to take examinations.
2	Contribution (20%)	Points to consider the class contribution: - To participate actively in group discussions. - To express your own opinions in class. - To listen to the other students opinions in class earnestly.
3	Report/essay (30%)	**1st semester:** Theme: "Why we should think about meaningful learning for students?" ▪ 1200 – 1500 words with computer typed ▪ Date of hand-in by March 30th ▪ The essay will be evaluated based on the Criteria for Evaluation Written Work in TEC. **2nd semester:** Theme: "What is the competence required of teachers in designing meaningful learning activities according to purpose? " ▪ 1200 – 1500 words with computer typed ▪ Date of hand-in by August 30th The essay will be evaluated based on the Criteria for Evaluation Written Work in TEC.
4	Performance (40%)	The assessment will be made based on the criteria for evaluation in each final of each semester: ▪ Semester 1: The final examinations for the 1st semester will be made during the 15th week of the 1st semester. ▪ Semester 2: The final examinations for the 2nd semester will be made during the 15th week of the 2nd semester.

VI. Other Course Specific Information

None

VII. Reading List and Resources

- Ashburn,E.A. and Floden, R. E.(2006). Meaningful Learning Using Technology: What Educators Need to Know and Do (Technology, Education--connections (Tec) Series). Teachers College Pr.
- Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree.
- Blokdyk,G.(2018). Meaningful Learning a Complete Guide. 5starcooks.
- Dick, W. Carey,L. and Carey,J.O. (2014) The Systematic Design of Instruction (8th Revised.). Pearson.
- Gagne R.M., Wager, W.W., Golas, K.C. and Keller, J.M. (2004) Principles of Instructional Design (Fifth edition). Wadsworth Pub Co.
- Herring, M.C.,Koehler, M.J. and Mishra.P. (ed.) (2016) Handbook of Technological Pedagogical Content Knowledge (TPACK) for Educators. London and New York : Routledge.
- Hooker,C.(2016) Mobile Learning Mindset: The Teacher's Guide to Implementation. International

Society for Technology in Education.

- Keengwe,J.(2017). Handbook of Research on Mobile Technology, Constructivism, and Meaningful Learning. Information Science Reference.
- Keller,J.M.(2010) Motivational Design for Learning and Performance: The ARCS Model Approach 2010th Edition. Springer.
- Kolb,L. (2017) Learning First, Technology Second. The Educator's Guide to Designing Authentic Lessons. International Society for Technology in Education; Portland Oregon/Arlington, VA.
- Morphew,V.N.(2012) A Constructivist Approach to the National Educational Technology Standards for Teachers. Washington D.C.: ISTE.
- Reigeluth,C.M. Beatty,B.J. and Myers,R.D.(2016). Instructional-Design Theories and Models, Volume IV: The Learner-Centered Paradigm of Education.
- Wiggins,G.,and McTighe,J., The ASCD (2013) The Understanding By Design Guide To Creating High-Quality Units. Pearson Teacher Education / Ascd College Textbook Series.
- Resources:
  o http://tpack.org/
  o http://www.punyamishra.com/wp-content/uploads/2013/08/TPACK-handbookchapter-2013.pdf
  o https://sites.google.com/a/msad60.org/technology-is-learning/samr-model
  o https://www.youtube.com/watch?v=9b5yvgKQdqE
  o http://www.hippasus.com/rrpweblog/archives/2012/08/23/SAMR_BackgroundExemplars.pdf
  o https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy
  o https://www.instructionaldesigncentral.com/whatisinstructionaldesign
  o https://www.niu.edu/facdev/_pdf/guide/learning/gagnes_nine_events_instruction.pdf
  o https://www.mindtools.com/pages/article/gagne.htm
  o http://www.tamus.edu/academic/wp-content/uploads/sites/24/2017/07/ARCS-Handout-v1.0.pdf
  o https://elearningindustry.com/arcs-model-of-motivation
  o https://www.oxfordlearning.com/difference-rote-learning-meaningful-learning/
  o http://www.edutopia.org/pdfs/edutopia-teaching-for-meaningful-learning.pdf
  o https://www.nesta.org.uk/sites/default/files/decoding_learning_report.pdf
  o http://www.michaelfullan.ca/wp-content/uploads/2014/01/3897.Rich_Seam_web.pdf
  o https://en.unesco.org/themes/ict-education/competency-framework-teachers
  o http://www.p21.org/index.php
  o https://www.learning-theories.com/paradigms
  o http://northweststate.edu/wp-content/uploads/files/21143_ftp.pdf
  o https://www.learning-theories.com/paradigms
  o http://integratetech.net/Tech_for_meaningful_learning
  o http://www.edudemic.com/active-learning-in-classroom/
  o http://www.crlt.umich.edu/active_learning_introduction
  o https://en.wikipedia.org/wiki/Active_learning

VIII. Lesson Schedule

1) Semester 1:1 credit (2 hours × 15 weeks)

Week No.	Date	Topic
1	April	What is required of us to learn towards the coming era?- 21st century skill -
2	April	Learning activities required to cultivate 21st century skills.
3	May	What is meaningful learning
4	May	Learning theory from behaviourism, Cognitivism, Constructivism paradigm (Learning Science)
5	May	Technology to support meaningful learning for learners
6	June	How to incorporate meaningful learning into classes (1) Active Learning
7	June	Active Learning with Technologies
8	June	How to incorporate meaningful learning into classes (2) Problem based Learning
9	June	Problem based Learning with Technologies
10	June	How to incorporate meaningful learning into classes (3) Authentic Learning

11	July	Authentic Learning with Technologies
12	July	Instructional Method for Meaningful learning
13	July	Design on Learning environment for Meaningful learning
14	July	Evaluation method of meaningful learning
15	August	Review and summary of all topics during this lecture time in the first semester.

2) Semester 2:1 credit (2 hours × 15 class hours)

Week No.	Date	Topic
1	November	What kind of teacher professional knowledge and skills are requested for meaningful learning with technologies? - UNESCO's ICT competency for Teacher and TPACK framework -
2	November	Relationship between TPACK framework and SAMR model
3	December	Instructional Design for meaningful learning with technologies
4	December	Case Study on Mathematics: meaningful learning with technologies (1)
5	December	Case Study on Mathematics: meaningful learning with technologies (2)
6	January	Case Study on Khmer: meaningful learning with technologies (1)
7	January	Case Study on Khmer: meaningful learning with technologies (2)
8	January	Case Study on English and other second language: meaningful learning with technologies (1)
9	January	Case Study on English and other second language: meaningful learning with technologies (2)
10	February	Case Study on Science: meaningful learning with technologies (1) Biology
11	February	Case Study on Science: meaningful learning with technologies (2) Geology
12	February	Case Study on Science: meaningful learning with technologies (3) Physics
13	February	Case Study on Science: meaningful learning with technologies (4) Chemistry
14	March	Points to remember when creating teaching and learning materials for meaningful learning with technologies: Universal Design and Bloom's Taxonomy
15	March	Review and summary of all topics during this lecture time in the second semester.

1. Semester 1:1 credit (2 hours × 15 weeks)

   Meaningful learning with technologies

Week 1

What is required of us to learn towards the coming era?

1	Date/time	
2	Venue	
3	Contents	The development of 21st century skills is being requested in school education. In order to respond to this problem, you focus on the concept of meaningful learning and the composition of learning environment using ICT. ・Have a prospect of the whole contents of this course ・Investigate "what is 21st century skills" and know the meaning ・Think about changes in the media environment around children.
4	Learning Outcomes	After completing work for this class, you will be able to explain the impact of technology on our lives, occupations and learning
5	Main Questions	How is our life and work affected by technology? What is required of us to learn towards the coming era?
6	Reading List and Resources	<u>Compulsory readings</u> http://www.p21.org/index.php https://www.oecd.org/site/educeri21st/40756908.pdf https://www.youtube.com/watch?v=FROIoaXJldw <u>Further readings</u> https://www.nesta.org.uk/sites/default/files/decoding_learning_report.pdf <u>Other Resources (e.g., websites, etc.)</u> https://www.aeseducation.com/career-readiness/what-are-21st-century-skills

Week 2

Learning activities required to cultivate 21st century skills

1	Date/time	
2	Venue	
3	Contents	You will think about what learning activities are required for learners to acquire 21st century skills. And you will discuss how school learning activities change by carrying out such learning. ・Discuss the problems of current learning activities described in "Rich_Seam" and future learning activities.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other why we need to design new learning activities for children?
5	Main Questions	What kind of learning is required in the 21st century? So what kind of learning environment should be prepared for at school? In what ways do you need learning towards the coming era?
6	Reading List and Resources	<u>Compulsory readings</u> http://www.michaelfullan.ca/wp-content/uploads/2014/01/3897.Rich_Seam_web.pdf https://www.youtube.com/watch?v=075aWDdZUlM <u>Further readings</u> Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree. <u>Other Resources (e.g., websites, etc.)</u>

Week 3

1	Date/time	
2	Venue	
3	Contents	In this lecture you will consider the concept of meaningful learning that guarantees the acquisition of 21st century skills. You think about the background that meaningful learning was issued. And you will discuss how school learning activities change by carrying out such learning. ・compare meaningful learning to the learning activities that school has done so far.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other why a meaningful learning is required and what meaningful learning is.
5	Main Questions	What kind of learning is required in meaningful learning? So what kind of learning environment should be prepared for at school? In what ways do you need learning towards the coming era?

6	Reading List and Resources	Compulsory readings
		https://www.oxfordlearning.com/difference-rote-learning-meaningful-learning/
		http://www.edutopia.org/pdfs/edutopia-teaching-for-meaningful-learning.pdf
		https://www.youtube.com/watch?v=OOfotsHDIwE
		Further readings
		https://www.pearsonhighered.com/assets/samplechapter/0/1/3/2/0132565587.pdf
		  Ashburn,E.A. and Floden, R. E.(2006). Meaningful Learning Using Technology: What Educators Need to Know and Do (Technology, Education--connections (Tec) Series). Teachers College Pr.
		  Blokdyk,G.(2018). Meaningful Learning a Complete Guide. 5starcooks.
		Other Resources (e.g., websites, etc.)
		https://www.bing.com/videos/search?q=meaningful+learning+in+mathematics&qpvt=meaningful+learning+in+mathematics&view=detail&mid=20F708E3C4BFE2CC54C6 20F708E3C4BFE2CC54C6&&FORM=VRDGAR

Week 4

Learning theory from Behaviourism, Cognitivism, Constructivism paradigm (Learning Science)

1	Date/time	
2	Venue	
3	Contents	It is important to capture the history of learning theory in considering the learning activities that have been carried out at school. Here, you understand "what the behaviourism learning theory is", "what the cognitivism learning theory is", "what the constructivism learning theory is and the background behind it. ・Visualize the relationship between three learning theory and learning theory behind meaningful learning.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other the relationship between three theory and learning theory behind meaningful learning.
5	Main Questions	What is the three learning theory? what is the background of it? How are the three learning theories and meaningful learning related?

6	Reading List and Resources	Compulsory readings
		    https://www.learning-theories.com/paradigms
		    http://northweststate.edu/wp-content/uploads/files/21143_ftp.pdf
		    http://thepeakperformancecenter.com/educational-learning/learning/theories/
		https://www.youtube.com/watch?v=ACowHxGEAUg
		Further readings
		  Morphew,V.N.(2012) A Constructivist Approach to the National Educational Technology Standards for Teachers. Washington D.C.:
		Other Resources (e.g., websites, etc.)

Week 5

Technology to support meaningful learning for learners

1	Date/time	
2	Venue	
3	Contents	You examine the learning activities that lead to meaningful learning for learners, and what are the technologies that support meaningful learning. ・Visualize the relationship between the meaningful learning activities and technologies.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other what are learning activities that lead to meaningful learning for learners and what technologies can support meaningful learning.
5	Main Questions	What technologies can support meaningful learning?
6	Reading List and Resources	Compulsory readings http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.597.7776&rep=rep1&type=pdf https://www.researchgate.net/publication/275961657_Technology_Integration_for_Meaningful_Learning-the_Constructivist_View https://www.slideshare.net/BaileyMohr/meaningful-learning-framework https://www.youtube.com/watch?v=31FIMwd8SaM Further readings Other Resources (e.g., websites, etc.) https://www.j-ets.net/ets/journals/2_3/grabe_book_review.pdf https://dergipark.org.tr/tr/download/article-file/252270

Week 6

How to incorporate meaningful learning into classes (1) Active Learning

1	Date/time	
2	Venue	
3	Contents	When incorporating meaningful learning into a class, active learning is sometimes organized as an idea. What is active learning? What kind of learning activities should you consider in class? Here you are asked to investigate, think, discuss and summarize what you know about the idea of active learning and how to advance it.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other "what is active learning and how to advance it." You can think about the relationship between active learning and meaningful learning.
5	Main Questions	What is active learning, how to advance it, what is the relationship between active learning and meaningful learning?

6	Reading List and Resources	Compulsory readings
		  https://cei.umn.edu/active-learning.
		  https://www.smartsparrow.com/what-is-active-learning/
		  http://www.queensu.ca/teachingandlearning/modules/active/04_what_is_active_learning.html
		  https://www.youtube.com/watch?v=UsDI6hDx5uI
		Further readings
		  Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree.
		Other Resources (e.g., websites, etc.)

Week 7

Active Learning with Technologies

1	Date/time	
2	Venue	
3	Contents	What technologies and learning environments are there to guarantee active learning, and what technologies and learning environments are beneficial? You summarize what was found through research, thoughts, and discussions about the relationship between active learning, technology, and learning environments during this class.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other the relationship between active learning and technologies and learning environment.
5	Main Questions	What is Active Learning with Technologies? How is Active Learning with Technologies?
6	Reading List and Resources	Compulsory readings https://lavc.edu/profdev/library/docs/Active-Learning-Technology-Tools.aspx https://www.sciencedirect.com/science/article/pii/S1369702103012252 https://www.uwo.ca/wals/pdf/technology-enabled.pdf https://www.youtube.com/watch?v=1Z2cOCaAox0 Further readings Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree. Other Resources (e.g., websites, etc.) https://www.techlearning.com/tl-advisor-blog/tech-tools-for-active-learning-classrooms

Week 8
How to incorporate meaningful learning into classes (2) Problem based Learning

1	Date/time	
2	Venue	
3	Contents	When incorporating meaningful learning into a class, problem-based learning is sometimes organized as an idea. What is problem-based learning? What kind of learning activities should you consider in class? Here you are asked to investigate, think, discuss and summarize what you know about the idea of active learning and how to advance it.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other "what is problem based learning and how to advance it." You can think about the relationship between problem based learning and meaningful learning.
5	Main Questions	What is problem-based learning? how to advance it. What is the relationship between problem based learning and meaningful learning?
6	Reading List and Resources	Compulsory readings https://www.researchgate.net/publication/226053277_Problem-Based_Learning_What_and_How_Do_Students_Learn. https://citl.illinois.edu/citl-101/teaching-learning/resources/teaching-strategies/problem-based-learning-(pbl) https://arrow.dit.ie/cgi/viewcontent.cgi?article=1011&context=ltcbk https://www.youtube.com/watch?v=RGoJIQYGpYk Further readings Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree. Other Resources (e.g., websites, etc.) http://www.ascd.org/publications/books/197166/chapters/What_Is_Problem-Based_Learning¢.aspx

Week 9

Problem based Learning with Technologies

1	Date/time	
2	Venue	
3	Contents	What technologies and learning environments are there to guarantee problem-based learning, and what technologies and learning environments are beneficial? You summarize what was found through research, thoughts, and discussions about the relationship between problem-based learning, technology, and learning environments during this class.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other the relationship between problem-based learning and technologies and learning environment.
5	Main Questions	What is Problem based Learning with Technologies? How is Problem based Learning with Technologies?

6	Reading List and Resources	Compulsory readings
		   https://arrow.dit.ie/cgi/viewcontent.cgi?article=1011&context=ltcbk
		   https://www.tp.edu.sg/staticfiles/TP/files/centres/pbl/pbl_cynthia_lim.pdf
		Further readings
		  Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree.
		Other Resources (e.g., websites, etc.)
		   https://www.researchgate.net/publication/286696729_Technology_and_problem-based_learning
		   https://www.youtube.com/watch?v=0pPriKf1f2o

Week 10

How to incorporate meaningful learning into classes (3) Authentic Learning

1	Date/time	
2	Venue	
3	Contents	When incorporating meaningful learning into a class, authentic learning is sometimes organized as an idea. What is authentic learning? What kind of learning activities should you consider in class? Here you are asked to investigate, think, discuss and summarize what you know about the idea of authentic learning and how to advance it.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other "what is authentic learning and how to advance it." You can think about the relationship between authentic learning and meaningful learning.
5	Main Questions	What is authentic learning, how to advance it, what is the relationship between authentic learning and meaningful learning?

6	Reading List and Resources	Compulsory readings
		   https://www.edglossary.org/authentic-learning/.
		   http://www.acel.org.au/acel/ACEL_docs/Publications/e-Teaching/2016/e-Teaching_2016_10.pdf
		   https://www.youtube.com/watch?v=UNP7hv0d0Rk
		Further readings
		  Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree.
		Other Resources (e.g., websites, etc.)

Week 11

Authentic Learning with Technologies

1	Date/time	
2	Venue	
3	Contents	What technologies and learning environments are there to guarantee authentic learning, and what technologies and learning environments are beneficial? You summarize what was found through research, thoughts, and discussions about the relationship between authentic learning, technology, and learning environments during this class.
4	Learning Outcomes	After completing work for this class, you will be able to explain to each other the relationship between authentic learning and technologies and learning environment.
5	Main Questions	What is Authentic Learning with Technologies? How is Authentic Learning with Technologies?

6	Reading List and Resources	Compulsory readings
		   https://www.researchgate.net/publication/252870294_What_is_an_Authentic_Learning_Environment
		   https://www.slideshare.net/dgachago/using-technologies-for-authentic-learning
		Further readings
		  Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree.
		Other Resources (e.g., websites, etc.)
		   https://sites.google.com/site/technologytoolboxforeducators/about-learning/real-world-learning/authentic-learning

Week 12

Instructional Method for Meaningful learning

1	Date/time	
2	Venue	
3	Contents	From weeks 3 to 11, you have deepened your understanding of meaningful learning from three perspectives: active learning, problem based learning, and authentic learning. During this lecture, you will think about the points in practicing meaningful learning in actual elementary and lower secondary schools. When incorporating meaningful learning in lessons, what kind of issue setting is effective? What are the necessary teaching materials and effective learning materials in promoting meaningful learning? ・Study about task setting and effective teaching and learning materials.
4	Learning Outcomes	After completing work for this class, you will be able to clarify the idea of lesson design incorporating meaningful learning effectively.
5	Main Questions	Can you explain idea of task setting and the useful teaching materials and learning materials in effectively promoting meaningful learning?

6	Reading List and Resources	Compulsory readings
		 https://antoniballester.com/wp-content/uploads/2017/03/Pdf-1.pdf
		  https://www.learner.org/workshops/socialstudies/pdf/session6/6.MeaningfulLearning.pdf
		  https://www.elesapiens.com/blog/how-to-create-meaningful-learning-in-the-classroom/
		  https://www.youtube.com/watch?v=BXT2STtm_54
		Further readings
		  Ashburn,E.A. and Floden, R. E.(2006). Meaningful Learning Using Technology: What Educators Need to Know and Do (Technology, Education--connections (Tec) Series). Teachers College Pr.
		  Blokdyk,G.(2018). Meaningful Learning a Complete Guide. 5starcooks.
		Other Resources (e.g., websites, etc.)

		https://prezi.com/pq10e3gyzcj_/chapter-4-designing-meaningful-learning-tasks/ https://www.sciencedirect.com/topics/computer-science/meaningful-learning

Week 13
Learning environment design for Meaningful learning

1	Date/time	
2	Venue	
3	Contents	When incorporating meaningful learning in lessons, what kind of learning environment is effective? What are the necessary teaching tools and effective learning tools in promoting meaningful learning? ・Study about learning environment and the useful teaching tools and effective learning tools.
4	Learning Outcomes	After completing work for this class, you will be able to clarify the idea of learning environment design incorporating meaningful learning effectively.
5	Main Questions	Can you explain idea of learning environment design and the useful teaching tools and learning tools in effectively promoting meaningful learning?
6	Reading List and Resources	<u>Compulsory readings</u> https://fcit.usf.edu/matrix/wp-content/uploads/2017/01/Five_Characteristics.pdf https://www.nap.edu/read/9853/chapter/10#132 https://www.youtube.com/watch?v=3pre5ahTM7g <u>Further readings</u> Ashburn,E.A. and Floden, R. E.(2006). Meaningful Learning Using Technology: What Educators Need to Know and Do (Technology, Education--connections (Tec) Series). Teachers College Pr. Bellanca,J.,and Brandt, R. (2010) 21st Century Skills: Rethinking How Students Learn. Solution Tree. Blokdyk,G.(2018). Meaningful Learning a Complete Guide. 5starcooks. <u>Other Resources (e.g., websites, etc.)</u> https://www.demcointeriors.com/blog/top-learning-environment-design-trends/ https://www.youtube.com/watch?v=xFlwkl7wzQI

Week 14
Evaluation method of meaningful learning

1	Date/time	
2	Venue	
3	Contents	When incorporating meaningful learning into the lesson, how should you evaluate the learning effects and outcomes? Do you need evaluation methods different from those of learning activities so far? ・Study the assessment and evaluation method which is effective for evaluating meaningful learning.
4	Learning Outcomes	After completing work for this class, you will be able to clarify the assessment and evaluation method which is effective for evaluating meaningful learning.
5	Main Questions	Can you explain idea of the assessment and evaluation method which is effective for evaluating meaningful learning?
6	Reading List and Resources	<u>Compulsory readings</u> https://core.ac.uk/download/pdf/55332890.pdf https://www.youtube.com/watch?v=yYcGO1Izs-U

		https://www.edutopia.org/blog/making-assessments-meaningful-heather-wolpert-gawron
		<u>Further readings</u>
		Ashburn,E.A. and Floden, R. E.(2006). *Meaningful Learning Using Technology: What Educators Need to Know and Do (Technology, Education--connections (Tec) Series)*. Teachers College Pr.
		Bellanca,J.,and Brandt, R. (2010) *21st Century Skills: Rethinking How Students Learn*. Solution Tree.
		Blokdyk,G.(2018). *Meaningful Learning a Complete Guide*. 5starcooks.
		<u>Other Resources (e.g., websites, etc.)</u>
		https://pdfs.semanticscholar.org/355a/91ed98446c995d820395488198e33aac9927.pdf
		http://proc.iscap.info/2017/pdf/4312.pdf

Week 15

Review and summary of all topics during this lecture time in the first semester

1	**Date/time**	
2	**Venue**	
3	**Contents**	With the aim of nurturing 21st century skills, what does it mean to pick meaningful learning in lessons? What is the difference between meaningful learning and the learning activities that have been done in class so far? What are the conditions for effectively incorporating meaningful learning into lessons? ・Look back on what you have considered in this semester ・Organize the main points.
4	**Learning Outcomes**	After completing work for this class, you will be able to explain clearly about the meaning of meaningful learning in class and conditions and environment for that.
5	**Main Questions**	Can you explain the meaning of meaningful learning in lesson and conditions and environment for that?
6	**Reading List and Resources**	<u>Compulsory readings</u> https://www.sciencedirect.com/topics/computer-science/meaningful-learning <u>Further readings</u> Ashburn,E.A. and Floden, R. E.(2006). *Meaningful Learning Using Technology: What Educators Need to Know and Do (Technology, Education--connections (Tec) Series)*. Teachers College Pr. Bellanca,J.,and Brandt, R. (2010) *21st Century Skills: Rethinking How Students Learn*. Solution Tree. Blokdyk,G.(2018). *Meaningful Learning a Complete Guide*. 5starcooks. Hooker,C.(2016) *Mobile Learning Mindset: The Teacher's Guide to Implementation*. International Society for Technology in Education Kolb,L. (2017) *Learning First, Technology Second. The Educator's Guide to Designing Authentic Lessons*. International Society for Technology in Education; Portland Oregon/Arlington, VA. Keengwe,J.(2017). *Handbook of Research on Mobile Technology, Constructivism, and Meaningful Learning*. Information Science Reference. <u>Other Resources (e.g., websites, etc.)</u> http://www.p21.org/index.php http://www.edutopia.org/pdfs/edutopia-teaching-for-meaningful-learning.pdf https://www.nesta.org.uk/sites/default/files/decoding_learning_report.pdf http://www.michaelfullan.ca/wp-content/uploads/2014/01/3897.Rich_Seam_web.pdf https://www.learning-theories.com/paradigms http://northweststate.edu/wp-content/uploads/files/21143_ftp.pdf

2. Semester 2:1 credit (2 hours × 15 weeks)

Pedagogies for Meaningful learning with technologies

Week 1

What kind of teacher professional knowledge and skills are requested to integrate ICT into teaching and learning? -UNESCO's ICT competency for Teacher and TPACK framework -

1	Date/time	
2	Venue	
3	Contents	With "Meaningful learning with technologies", you have learned what meaningful learning is and why it is necessary to think about it.. In this "Pedagogies for Meaningful learning with technologies", you think about what kind of teacher professional knowledge and skills are requested to integrate ICT into subject teaching and learning, through knowledge of resources on WWW and through the use of applications that support collaboration. In this lecture in the second semester, you pay attention to UNESCO's ICT competency for Teacher and TPACK framework. You consider the abilities required of teachers to use ICT in class.
4	Learning Outcomes	After completing work for this class, you can pick up something such as knowledge and skills required for teachers to integrate ICT into teaching and learning.
5	Main Questions	What are the expertise and skills required of teacher to integrate ICT into teaching and learning? What is TPACK framework?
6	Reading List and Resources	<u>Compulsory readings</u> https://en.unesco.org/themes/ict-education/competency-framework-teachers https://www.open.edu/openlearncreate/pluginfile.php/306820/mod_resource/content/2/UNESCO%20ICT%20Competency%20Framework%20V3.pdf https://www.youtube.com/watch?v=O35n_tvOK74 https://www.youtube.com/watch?v=xoSJ3_dZcm8 http://tpack.org/ https://www.youtube.com/watch?v=yMQiHJsePOM <u>Further readings</u> Morphew,V.N.(2012) A Constructivist Approach to the National Educational Technology Standards for Teachers. Washington D.C.: ISTE. <u>Other Resources (e.g., websites, etc.)</u> https://www.teachhub.com/teaching-21st-century-skills

Week 2
Relationship between TPACK framework and SAMR model

1	Date/time	
2	Venue	
3	Contents	There are some frameworks of expertise required of teacher when utilizing ICT in lesson. You have learned the concept of TPACK framework, which added technological knowledge as expertise required for teacher in information society last week. There are also some development models of strategies that teacher utilizes ICT in lesson. The **S**ubstitution, **A**ugmentation, **M**odification, **R**edefinition Model offers a method of seeing how computer technology might impact teaching and learning. It also shows a progression that adopters of educational technology often follow as they progress through teaching and learning with technology. ・Understand what is newly requested as teacher's expertise through thinking about relationship between TPACK framework and SAMR model.

4	Learning Outcomes	After completing work for this class, you will be able to explain the expertise required for teachers at that time, using TPACK framework. Also, you will be able to explain the use of ICT in lesson by using SAMR model.
,5	Main Questions	What is SAMR model? What is relationship between TPACK framework and SAMR model

6	Reading List and Resources	<u>Compulsory readings</u>
		
		http://www.punyamishra.com/wp-content/uploads/2013/08/TPACK-handbookchapter-2013.pdf
		  https://www.youtube.com/watch?v=9b5yvgKQdqE
		  http://www.hippasus.com/rrpweblog/archives/2012/08/23/SAMR_BackgroundExemplars.pdf
		  https://sites.google.com/a/msad60.org/technology-is-learning/samr-model
		<u>Further readings</u>
		  Herring, M.C.,Koehler, M.J. and Mishra.P. (ed.) (2016) Handbook of Technological Pedagogical Content Knowledge (TPACK) for Educators. London and New York : Routledge.
		<u>Other Resources (e.g., websites, etc.)</u>

Week 3

Instructional Design for meaningful learning with technologies

1	Date/time	
2	Venue	
3	Contents	As expert knowledge required for teachers in integrating ICT into classes, the findings of Instructional Design can be mentioned. Here, you understand what instructional design is. Instructional design (ID) is the practice of creating "instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and appealing." The process consists broadly of determining the state and needs of the learner, defining the end goal of instruction, and creating some "intervention" to assist in the transition. The outcome of this instruction may be directly observable and scientifically measured or completely hidden and assumed. There are many instructional design models but many are based on the ADDIE model with the five phases: analysis, design, development, implementation, and evaluation. As a field, instructional design is historically and traditionally rooted in cognitive and behavioural psychology, though recently constructivism has influenced thinking in the field. Also, one of the findings of instructional design, which is often referred to, is Keller's ARCS Model of Motivation. An effective instructor must not only gain a learner's attention but hold it throughout a course or lesson. John Keller synthesized existing research on psychological motivation and created the ARCS model. ARCS stands for Attention, Relevance, Confidence, and Satisfaction. The ARCS motivational design process is a systematic problem solving approach that requires knowledge of human motivation and progresses from learner analysis to solution design.
4	Learning Outcomes	After completing work for this class, you will be able to explain what instructional design is. Also you will be able to explain Keller's ARCS Model of Motivation. You will think about why that knowledge will be effective when integrating ICT into lessons. you will think about why that knowledge will be effective when integrating ICT into lessons.

5	**Main Questions**	What is instructional design? Why is instructional design when integrating ICT into lessons? What is Keller's ARCS Model of Motivation? Why is Keller's ARCS Model of Motivation when integrating ICT into lessons?
6	**Reading List and Resources**	Compulsory readings https://www.youtube.com/watch?v=w0iQgStGND4 https://www.youtube.com/watch?v=dWqc3s64LIU https://www.youtube.com/watch?v=7z70BFlGbCA https://educationaltechnology.net/definitions-instructional-design/ https://www.instructionaldesigncentral.com/whatisinstructionaldesign https://sandrajburns.com/instructional-models/john-kellers-arcs-model-of-motivational-design/ https://www.pearsonhighered.com/assets/samplechapter/0/1/3/2/0132565587.pdf Further readings Dick, W. Carey,L. and Carey,J.O. (2014) The Systematic Design of Instruction (8th Revised.). Pearson. Reigeluth,C.M. Beatty,B.J. and Myers,R.D.(2016). Instructional-Design Theories and Models, Volume IV: The Learner-Centered Paradigm of Education. Keller,J.M.(2010) Motivational Design for Learning and Performance: The ARCS Model Approach 2010th Edition. Springer. Other Resources (e.g., websites, etc.) https://www.bing.com/videos/search?q=instructional+design&view=detail&mid=2EFB6ADC5780E589FDCF2EFB6ADC5780E589FDCF&FORM=VIRE https://antoniballester.com/wp-content/uploads/2017/03/Pdf-1.pdf https://pdfs.semanticscholar.org/0672/566bd3efb95713c7a7a2cdebb32521e23ae3.pdf

Week 4

Case Study on Mathematics: meaningful learning with technologies (1)

4.

1	**Date/time**	
2	**Venue**	
3	**Contents**	In the time of this lecture, you will learn how to design meaningful learning in relation to arithmetic and mathematics. What teaching and learning materials are useful for designing meaningful learning activities in arithmetic and mathematics? You think about what technologies can guarantee meaningful learning in arithmetic math and mathematics.
4	**Learning Outcomes**	Through this lecture, you will find ways to design meaningful learning in relation to arithmetic and mathematics.
5	**Main Questions**	What teaching and learning materials are useful for designing meaningful learning activities in arithmetic and mathematics? What technologies can guarantee meaningful learning in arithmetic and mathematics?
6	**Reading List and Resources**	Compulsory readings https://www.weareteachers.com/strategies-in-teaching-mathematics/ https://web.ics.purdue.edu/~rallrich/learn/mean.html Further readings https://files.eric.ed.gov/fulltext/EJ1064314.pdf https://davidwees.com/content/ways-use-geogebra-mathematics-classroom/ https://www.youtube.com/watch?v=dIbXVdk3gws https://www.projectmaths.ie/for-students/learn-to-use-geogebra/ Other Resources (e.g., websites, etc.) https://www.bing.com/videos/search?q=meaningful+learning+in+mathematics&qpvt=meaningful+learning+in+mathematics&view=detail&mid=17BCA68F5A2427F46BE117BCA68F5A2427F46BE1&&FORM=VRDGAR https://www.elesapiens.com/blog/how-to-create-meaningful-learning-in-the-classroom/

Week 5

Case Study on Mathematics: meaningful learning with technologies (2)

1	Date/time	
2	Venue	
3	Contents	Through this lecture, you will consider how to design meaningful learning of mathematics using an application called "geogebra". You will learn what kind of math learning activities "geogebra" is used in, and what instructional design is needed to design meaningful learning.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning by using "geogebra".
5	Main Questions	What instructional design is needed to design meaningful learning in case of using "geogebra".?
6	Reading List and Resources	Compulsory readings https://files.eric.ed.gov/fulltext/EJ1064314.pdf https://davidwees.com/content/ways-use-geogebra-mathematics-classroom/ https://www.youtube.com/watch?v=dIbXVdk3gws https://www.projectmaths.ie/for-students/learn-to-use-geogebra/ https://www.bing.com/videos/search?q=how+to+use+geogebra+in+mathmatics&view=detail&mid=006D237F36C79AFEC95A006D237F36C79AFEC95A&FORM=VIRE Further readings Other Resources (e.g., websites, etc.) https://www.quora.com/How-can-I-use-GeoGebra

Week 6

Case Study on Khmer: meaningful learning with technologies (1)

1	Date/time	
2	Venue	
3	Contents	In the time of this lecture, you will learn how to design meaningful learning in relation to Khmer. What teaching and learning materials are useful for designing meaningful learning activities in Khmer? You think about what technologies can guarantee meaningful learning in Khmer.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning in relation to Khmer.
5	Main Questions	What teaching and learning materials are useful for designing meaningful learning activities in Khmer? What technologies can guarantee meaningful learning in Khmer?
6	Reading List and Resources	Compulsory readings https://ierc-publicfiles.s3.amazonaws.com/public/resources/Curriculum%20Review%20Report%20Final%205th%20Dec.pdf http://seasite.niu.edu/khmer/writingsystem/writingsyst_set.htm http://www.krou.moeys.gov.kh/kh/ Further readings Other Resources (e.g., websites, etc.) https://www.101languages.net/resources/khmer/#General https://www.tkpark.or.th/stocks/extra/000a1f.pdf#search=%27materials+for+Khmer+language+in+praimary%27

Week 7

Case Study on Khmer: meaningful learning with technologies (2)

1	Date/time	
2	Venue	
3	Contents	Through this lecture, you will consider how to design meaningful learning of Khmer using "http://seasite.niu.edu/khmer/writingsystem/writingsyst_set.htm" and resources in "http://www.krou.moeys.gov.kh/kh/". You will learn what kind of Khmer learning activities "http://seasite.niu.edu/khmer/writingsystem/writingsyst_set.htm" and resources in "http://www.krou.moeys.gov.kh/kh/" is used in, and what instructional design is needed to design meaningful learning.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning by using "http://seasite.niu.edu/khmer/writingsystem/writingsyst_set.htm" and resources in "http://www.krou.moeys.gov.kh/kh/".
5	Main Questions	What instructional design is needed to design meaningful learning in case of using "http://seasite.niu.edu/khmer/ writingsystem/ writingsyst _set.htm" and resources in "http://www.krou.moeys.gov.kh/kh/".?
6	Reading List and Resources	Compulsory readings http://seasite.niu.edu/khmer/writingsystem/writingsyst_set.htm http://www.krou.moeys.gov.kh/kh/ Further readings Other Resources (e.g., websites, etc.) https://www.raintreecambodia.com/news/2019/8/1/scratch-coding-in-khmer-with-tiny-coding-cats

Week 8

Case Study on English and other second language: meaningful learning with technologies (1)

1	Date/time	
2	Venue	
3	Contents	In the time of this lecture, you will learn how to design meaningful learning in relation to English and other second language. What teaching and learning materials are useful for designing meaningful learning activities in English and other second language? You think about what technologies can guarantee meaningful learning in English and other second language.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning in relation to English and other second language.
5	Main Questions	What teaching and learning materials are useful for designing meaningful learning activities in English and other second language? What technologies can guarantee meaningful learning in English and other second language?
6	Reading List and Resources	Compulsory readings http://ijreeonline.com/article-1-120-en.pdf https://englishpost.org/tools-teach-english-technology/ Further readings Other Resources (e.g., websites, etc.) https://busyteacher.org/13732-using-technology-esl-instruction-10-modern-ways.html http://jetprogramme.org/wp-content/MAIN-PAGE/current/publications/altcirseahandbook/7all.pdf

Week 9

Case Study on English and other second language: meaningful learning with technologies (2)

5.

1	Date/time	
2	Venue	
3	Contents	Through this lecture, you will consider how to design meaningful learning of English and other second language using http://www.elllo.org/english/begin/index.html and other sources on www. You will learn what kind of English and other second language learning activities http://www.elllo.org/english/begin/index.html and other sources on www is used in, and what instructional design is needed to design meaningful learning.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning by using http://www.elllo.org/english/begin/index.html and other sources on www.
5	Main Questions	What instructional design is needed to design meaningful learning in case of using http://www.elllo.org/english/begin/index.html and other sources on www.?
6	Reading List and Resources	Compulsory readings http://www.elllo.org/english/begin/index.html Further readings Other Resources (e.g., websites, etc.)

Week 10

Case Study on Science: meaningful learning with technologies (1) -Biology-

1	Date/time	
2	Venue	
3	Contents	In the time of this lecture, you will learn how to design meaningful learning in relation to Biology. What teaching and learning materials are useful for designing meaningful learning activities in Biology? You think about what technologies can guarantee meaningful learning in Biology.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning in relation to Biology.
5	Main Questions	What teaching and learning materials are useful for designing meaningful learning activities in Biology? What technologies can guarantee meaningful learning in Biology?
6	Reading List and Resources	Compulsory readings http://www.krou.moeys.gov.kh/kh/ Further readings https://www.researchgate.net/publication/331865942_A_Concept_Map_of_Evolutionary_Biology_to_Promote_Meaningful_Learning_in_Biology Other Resources (e.g., websites, etc.) https://www.scienceprofonline.com/instructors-corner/instructors-corner-main.html http://www.bioedonline.org/

Week 11

Case Study on Science: meaningful learning with technologies (2) -Geology-

1	Date/time	
2	Venue	

3	Contents	In the time of this lecture, you will learn how to design meaningful learning in relation to Geology. What teaching and learning materials are useful for designing meaningful learning activities in Geology? You think about what technologies can guarantee meaningful learning in Geology.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning in relation to Geology.
5	Main Questions	What teaching and learning materials are useful for designing meaningful learning activities in Geology? What technologies can guarantee meaningful learning in Geology?
6	Reading List and Resources	Compulsory readings http://www.krou.moeys.gov.kh/kh/ https://serc.carleton.edu/NAGTWorkshops/structure/resources.html https://geology.com/teacher/ Further readings Other Resources (e.g., websites, etc.)

Week 12

Case Study on Science: meaningful learning with technologies (3) -Physics-

1	Date/time	
2	Venue	
3	Contents	In the time of this lecture, you will learn how to design meaningful learning in relation to Physics. What teaching and learning materials are useful for designing meaningful learning activities in Physics? You think about what technologies can guarantee meaningful learning in Physics.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning in relation to Physics.
5	Main Questions	What teaching and learning materials are useful for designing meaningful learning activities in Physics? What technologies can guarantee meaningful learning in Physics?
6	Reading List and Resources	Compulsory readings http://www.krou.moeys.gov.kh/kh/ https://www.thinkib.net/physics/teaching-materials Further readings https://www.real-world-physics-problems.com/physics-teaching-resources.html Other Resources (e.g., websites, etc.) http://zitogiuseppe.com/didattica.html

Week 13

Case Study on Science: meaningful learning with technologies (4) -Chemistry-

1	Date/time	
2	Venue	
3	Contents	In the time of this lecture, you will learn how to design meaningful learning in relation to Chemistry. What teaching and learning materials are useful for designing meaningful learning activities in Chemistry? You think about what technologies can guarantee meaningful learning in Chemistry.
4	Learning Outcomes	Through this lecture, you will find ways to design meaningful learning in relation to Chemistry.
5	Main Questions	What teaching and learning materials are useful for designing meaningful learning activities in Chemistry? What technologies can guarantee meaningful learning in Chemistry?
6	Reading List and Resources	Compulsory readings http://www.krou.moeys.gov.kh/kh/

		http://www.rsc.org/learn-chemistry
		<u>Further readings</u>
		https://www.longdom.org/open-access/pedagogical-methods-and-technology-used-in-chemistry-secondaryeducation-2329-6798-1000223.pdf
		<u>Other Resources (e.g., websites, etc.)</u>

Week 14

Points to remember when creating teaching and learning materials for meaningful learning with technologies: Universal Design and Bloom's Taxonomy

1	Date/time	
2	Venue	
3	Contents	In this lecture, you will consider points to keep in mind when designing teaching materials and lesson design for meaningful learning activities in each subject. When developing educational materials for meaningful learning activities, you need to consider universal design. As you design your lesson, you will learn to clarify your goals by referring to Bloom's Taxonomy.
4	Learning Outcomes	When you design your lesson for meaningful learning activities, you can clarify your goals by referring to t Bloom's Taxonomy and think about Universal design.
5	Main Questions	What is Universal design for meaningful learning activities? How does Bloom 's Taxonomy help with meaningful learning activities?
6	Reading List and Resources	<u>Compulsory readings</u> https://www.washington.edu/doit/what-universal-design-0 http://universaldesign.ie/What-is-Universal-Design/ https://www.youtube.com/watch?v=AGQ_7K35ysA https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/ https://www.youtube.com/watch?v=OOy3m02uEaE <u>Further readings</u> Anderson,L.W., Krathwohl, D.R., Airasian, P.W. and others (2000) Taxonomy for Learning, Teaching, and Assessing, A: A Revision of Bloom's Taxonomy of Educational Objectives, Complete Edition. Addison Wesley. Wiggins,G.,and McTighe,J., The ASCD (2013) The Understanding By Design Guide To Creating High-Quality Units. Pearson Teacher Education / Ascd College Textbook Series. <u>Other Resources (e.g., websites, etc.)</u> https://www.middleweb.com/21295/the-intersection-of-udl-and-blooms-taxonomy/ http://wrsdudl.weebly.com/blooms-and-udl.html https://www.theudlproject.com/udl-tools---all-grades.html

Week 15

Review and summary of all topics during this lecture time in the second semester

1	Date/time	
2	Venue	
3	Contents	So far, you have thought about what kind of teacher professional knowledge and skills are requested to integrate ICT into teaching and learning, through knowledge of those information resources on books and WWW and through the use of applications. Here you review and summary of all topics in the first semester and discuss ways to points to be noticed while practically operating it.
4	Learning Outcomes	After completing work for this class, you will be able not only to understand what kind of teacher professional knowledge and skills are requested to integrate ICT into teaching and learning, but also explain its effective management method and points to be noted.

5	**Main Questions**	Can you explain things you have to be careful when promoting and managing teacher professional knowledge and skills requested to integrate ICT into teaching and learning?
6	**Reading List and Resources**	<u>Compulsory readings</u> <u>Further readings</u> Ashburn,E.A. and Floden, R. E.(2006). Meaningful Learning Using Technology: What Educators Need to Know and Do (Technology, Education--connections (Tec) Series). Teachers College Pr. Dick, W. Carey,L. and Carey,J.O. (2014) The Systematic Design of Instruction (8th Revised.). Pearson. Gagne R.M., Wager, W.W., Golas, K.C. and Keller, J.M. (2004) Principles of Instructional Design (Fifth edition). Wadsworth Pub Co. Herring, M.C.,Koehler, M.J. and Mishra.P. (ed.) (2016) Handbook of Technological Pedagogical Content Knowledge (TPACK) for Educators. London and New York : Routledge. Keller,J.M.(2010) Motivational Design for Learning and Performance: The ARCS Model Approach 2010th Edition. Springer. Reigeluth,C.M. Beatty,B.J. and Myers,R.D.(2016). Instructional-Design Theories and Models, Volume IV: The Learner-Centered Paradigm of Education. Wiggins,G.,and McTighe,J., The ASCD (2013) The Understanding By Design Guide To Creating High-Quality Units. Pearson Teacher Education / Ascd College Textbook Series. <u>Other Resources (e.g., websites, etc.)</u>