

2 IOPHORFDWLRQ \$ NDVRI X

3 KRQH b

' HODHJU P RGH 2 QOQH

3 KRQH FRQI HUHQFH/b8 S V R W K U H G X Q J W K H V H P H M M U 7 % \$ P D Q G D R W 3 )  
7HDFKLQJ DMWWDQW1 RQH

3 WUHTXUVW \* UDG OMWWDQG QJ LQ67( 0 OHQ VSK VEV FKHP LW FLYDQJLQHJQJ .  
HQJLQHJQJ JHRJUDSK JHRSK VF VK G RQJ\ WFKQRORJ\ HQJLQHJQJ P DMHP DMFV  
LQWKF RU

&RXUH' HMFLSWRQ ,QMRG R WQVR\$ VP RVSKHUF6F HQF MFRP SUHVWHSK VEDOFKH  
G QDP LF DSURF MHVRI WKHWSRSVSKHJH 7KHJRYHQLQJ FRQHUYDWRQ E DDQH HTXDW  
F RWXHQW G UDUZ DMUVE WQF M VRMOP DW HT XMRQRI FRQMQXLW HQHJ\  
WKHP RG QDP LF VHQMRS\ ODZ RI WKHP RG QDP LF VDQGP RP HQXP 1 HZ VRQ\ G  
SUHMHQMGDQGH SODLQH

6XEMFW\$ GGUHWHG

- 6R00
  - F R
  - %DV
  - 6DM
  - \* UH
  - 2 SWF

K W W S V L Q W U R D W P X R D V M G I X F V R O O D Q K W \ D W P F K H P



' LIHJHQFHEHMZ HHQ\$70 DQG\$70 &+(0 , WI VRE DDQF HHHHQWUHWRI XQG HJUDG ZMM  
 DQGJUDG ZMMWXG BW 7KHJRUH , ZLQDWIJQVSHFDOWW MIRWUDG ZMMWXGHQWWDWSUREHWH  
 PDMUDODWJQHGDKHJUDG ZMMOMHO7KHVDP HDSSOHVIRUWKHXQG HJUDGXDWMOMHO7KLVP HDQVMKH  
 DUHGWWQF VSHILHJQF MLOQWKG HUHRI GIIQFXOV LQWHDWJQP HQWLQDFFRUGZ LMKWKGHIIHJQWRDORI  
 VKHODLQLQJ RXW IR H 7KLVP HDQVDP RQJ RWKHUMLQJVVKDARYHUMHMP HIUDP HRI VKHFOW JUDGXDMM  
 WXG BW ZLQDQHGD GMQDQHGD QJ DQG RUYLG RZ DMFKLQJ DWJQP HQWVRDFKLYHVKHODLQLQJ  
 RXW IR HVWDWKHJUDG ZMMOMHO ZLQE HUHT XUHGVRG VEXWUHGXOVXQG HDJLYHQDVFWZ KLOI  
 XQG HJUDG ZMMWXG BWDUHQRWDNHGVRG RR ZLQE HUHT XUHGVRUHDGDUHHDUFK UHMLZ SDSHU  
 UHOMYDQWVRVKHVRSLFRI VKHJUHSF WKHQW ZLQDZ DVE HDWJQHGGIIHJQWRUDGGWQRQDOKRP HZ RUN  
 SURE KEE IO@

6\OODEZ\ \$&+(0 \_ , QWURGXFWLRQ WR \$WPRVSKHULF 6FLHQFH

2 V\KHUFRXU\H\HMRXUFHV\BODVHUHDQ\HV\KDWZ\KHQWXG\B\WHQROQXQYH\J\XQYH

6\O O D E Z V \$&+(0 \_ , Q W U R G X F W L R Q W R \$ W P R V S K H U L F 6 F L H Q F H

\$ C O S U R E I P V K D Y H V R E H R O H G L Q U H D G D I E V O / O I V F D Q Q H G I L Q D Q G V X E P L W M G E \ H P D L O Z L M K F O D U  
L G K M O F M A R Q R I V K H X Q L W Q X P E H R D Q G \ R X U Q D P H I 5 H D G D I E V O / O I P H D Q V H L M K H U F O D U K D Q G Z U M Q J R U  
W S H G G R E I O V S D F I S X V L Q J D M O D W D I O I

HP DLODV, F DQRWJDUDQMHHP DLODF FW

\$ OOWXG BWLQVHF DWZ HUHLQ RUP HGDE RWVVKHSRQFLH/DWVKEH ILQQLQJ RI VKHFOWDQGLQVKH  
V COOE X DQGLWZ RXCOE HKQI DLURHMHU RQHHOHWRJLYHRQSHUVRQDQH FHSWRQ

5 HTXLHG7HFQROJ\ 6RIVZ DUH 6VXG BWP XWKDYH UHJXQUDF FWVVRDFRP SXWUDQGVKH, QMLQHWR  
DF FWVVRQOQHP DMUDQYRQVLF DWURRP SDJH 6VXG BWPQHGDOSVRS 3& 0 DF RUMDEOMZ LMK  
E BZ VHUD8\$) HP DLODG GHUVRDF FWVVKHT XMRQODLHVDQGT X] HV DQGDFFHVVRVKHLQMLQH/W Q  
VKHG MF HRIVZ DUHVRZ DMF KP S YLGHRVKDVRE HQWDQG, HS IFWVKDW RX FDQKDQGIDQGZ RUNZ LMK  
\$ G B HUHDG HJRRJQIRUP V JRRJQIG R JRRJQIVKHW DQGH FHO

\$ FDGHP LF, QMUJUW + RQRU&RGHDQG3 DJLDLVP , H SHF WWXG BWWVXE PLWZ QRUJLQDQZ RUNDQG  
UH HUHQF HDORMHuz RUNDQGLQMQF XDDQG BVZ LMK DSSURSLDMUH HUHQFH DQGFVWIRQ \$ VGHMFUEHGE  
8\$) VF IRDMIFG VKRQHMW F RMWXMV/DYLROMRQRI VKHXQLYHUMW UXOMDQGUHJXOMRQV/DQGLV  
SXQLKDE KDF FUBQJ VRVKHSURF IS XH/RXWQHGE 8\$) 6FKRDMIFG VKRQHMW LFOQGHV EXWVQRW  
QP LMGVR F KDMQJ RQDQH DP SQJLDLVP DQGFRDMRQ & KDMQJ LFOQG MSURYLGQJ DQZ HUVR RU  
VONLQJ DQZ HUVIURP DORMKHUWKG BWW3DJLDLVP LFOQG MXVHRI DORMKHUDXWKRUE/Z RUGVRUDUJXP HQW  
Z LMKRXWDWME XIRQ & ROVMRQLQF XG MXQDXWKRUI HGFRDDE RDWRQZ LMK DORMKHUSHURQLQSUHSUQJ  
Z UWHQZ RUNI RUI XQ@IW

6\OODEXV \$

( [ SODQMRQR 1 %, : JUDGM

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7 KKHQHJLWVXWVH8\$) UHDUGQJ VVHJUDQMQJ RI 1 %\* UDG M7KH1 %JUDGHVIRUXVHRQO LQ  
VWXDMRQV\QZ KLF KKHQHJLWVXWVH8\$) UDG M7KH1 %JUDGHVIRUXVHRQO LQ  
Z LOORWE HJDQMG

<RXULQWKF RIU RQZ VWH8 QYHJW RI \$ OMD) DUE DNQ,QFRP SOMM\* UDGH3RQF Í7KHOMMUÍ,î  
,QF IR SOMM LV DMP SRDU JUDG IXVHGVR LQG FEDMVKDWKHGXG RWKDVDM DFVRUO FRP SOMMG & RU  
E MMU WHP DMRUW RI Z RUNLQDF RXUHE XWRUSHURQDQHDRVQE HRQGWHGXGQVÍ/FRQMRQVXFK DV  
VLF QHW KHKDVRWE HQDE QMRF IR SOMMVKHFRXUHG XQJ VWHUJXQDWH HMMU1 HJQHQFHRU  
LQG ILHUHQF HDUHQWDF FSHDE QWHDVRQVI RUDQÍ.î JUDG IH

# Glossary of Terms

6XFIORQHIXOM\ P\H\ \E\ R\ S\O\ M\ R\ Q\ R\ I\ V\K\ L\ V\ F\ R\ X\ U\ H\ G\ B\ H\ Q\ G\ V\ R\ Q\ F\ R\ P\ P\ L\ W\ M\ Q\ \ R\ X\ U\ H\ O\ H\ D\ U\ \ D\ Q\ G\ P\ D\ L\ Q\ \ M\ Q\ Q\ \ R\ X\ U\ H\ I\ R\ U\ M\ D\ L\ O\ U\ H\ V\ R\ V\ X\ E\ P\ L\ W\ D\ W\ J\ Q\ P\ H\ Q\ W\ L\ Q\ D\ W\ P\ H\ O\ P\ D\ Q\ Q\ H\ U\ P\ D\ I\ U\ H\ X\ O\ W\ Q\ I\ D\ F\ X\ O\ V\ L\ Q\ W\ D\ M\ G\ :\ I\ W\ K\ G\ U\ D\ Z\ D\ O\ U\ R\ P\ V\ K\ H\ F\ R\ U\ H\ Z\ K\ F\ D\ U\ H\ X\ O\ W\ Q\ D\ :\ R\ Q\ \ R\ X\ U\ M\ D\ Q\ F\ U\ S\ W

,QWUXFVRUHRSQHWP H ,WHCHDUO VVNHP HDE RWDZ HNRURVRJUDG HZ UWMQDWJQP HQWDI WU  
VXE PLWRQ 7KHUHDUHYRQDU T X] HMKDWSURYLG H P HG DMH H G E D FQDGGLRQVR RXWUDGH  
\ RXZ LOUJF BYHIIHG E D IERIP %RQDOLBZPBRNEDVTRUSP50 X'C— P•TM\$9ipÙ... V



## Introduction to Atmospheric Sciences

Number: ATM401

Instructor: Carmen N. Moelders, aka Nicole Mölders

Email: cmoelders@alaska.edu

Office hours: Thursday 1-2 pm on google hangout

Office location: Akasofu 309

Phone: +1 907 474 7910

Delivery mode: Online

Phone conferences: Up to three during the semester TBA (mandatory P/F)

Teaching assistant: None

Prerequisites: Upper class standing in STE

- Solar and terrestrial radiation, radiative equilibrium, radiative-convective equilibrium
- Basics of meteorology
- Satellite remote sensing
- Greenhouse effect
- Ozone depletion and their influence on general circulation models

Students will learn how to apply the knowledge and skills learned in the course. After all students will be able to

- Explain the basic principles of atmospheric dynamics and thermodynamics.
- Solve problems related to the conservation (balance) equations for aerosol and cloud particles, mass (equation of continuity), energy (radiation balance), momentum (Newton's law of motion), and heat transfer.

want to take this class. The application assignments are tailored to the different student groups (ATM401, ATM601, CHEM601). However, in the discussion group the students at both levels are in the same cohort. There might be up to three phone conference during the semester where I will call you to discuss class material.

Suggested Readings/Textbooks: All reading and application assignments will be available online.

G m` `` UHVA (g\$ %` p` = b h f c X i Wh ] c b` h c` 5 h a c g d \ Y f ] W` G W] Y b W

to program

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G m` `` UHVA (g\$ %` p` = b h f c X i Wh ] c b` h c` 5 h a c g d \ Y f ] W` G W] Y b W

All problems have to be solved in readable style, scanned in and uploaded to the problem sheet.

"Readable style" means either clear hand writing or typed, double-spaced, using at least a 12-point font, one-inch margins, and in hard copy format. Latex is a great software to write equations. If ya

equation sheets. Moreover, there will be tasks that are ONLY designed for graduate students and these tasks are indicated as such. These tasks require skills that undergraduate students usually do not have yet (e.g., programming) or that are not an expected learning goal for them right now (e.g. making reasonable assumptions, justify assumption). The undergraduate students will be assigned a task at the undergraduate level to work on at that time.

Required Technology Software: Students must have regular access to a computer and the Internet to access online materials on this classroom page. Students need a laptop, PC, Mac or tablet with a browser, a UAF email address to access the questionnaires and quizzes, and access to the internet. On the device software to watch mp4 videos has to be installed. I expect that you can handle and work with Adobe reader, google forms, google doc, google sheets, and excel. •

All problems have to be solved in readable style, scanned in and submitted by email with clear identification of the unit number and your name. "Readable style" means either clear hand writing or typed, double-spaced, using at least a 12-point font, one-inch margins, and in hard copy format. Latex is a great software to write equations. If you have not met these stipulations, I will return it to you ungraded. Submission will not be accepted via fax unless you make prior arrangements with me. When programming tasks are assigned the code has to be submitted as part of the assignment, i.e. it is not sufficient to just submit the results. I want to see how you got there. All results of problem tasks will have to be discussed what they mean for the water cycle.

yss

It is the student's responsibility to submit the assignments and participate in the discussion group in time. I strongly suggest that you plan and schedule your work and start working on your assignments before points due. I recommend having backup systems in place so you can have all work completed on schedule. Getting work done on time is a key to early success in your business or scientific career. A major complaint of employers is that faculty do not instill a sense of responsibility in students.

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G m` ` UHVA (g\$ %` p` = b h f c X i Wh] c b` h c` 5 h a c g d \ Y f ] W` G W] Y b W

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### Explanation of NB/I/W grades

This course adheres to the UAF regarding the granting of NB Grades. The NB grade is for use only in situations in which the instructor has No Basis upon which to assign a grade. In general, the NB grade will not be granted.

helpful resources, and maximize their distance learning experience. Contact the UAF eCampus Student Services staff at 907.455.2060 or toll free 1.800.277.8060 or contact staff directly – for directory listing see: <https://ecampus.uaf.edu/contact>

UAF Help Desk: Go to <http://www.alaska.edu/oit/> to see about current network outages and technology news. For technical questions, contact the Help Desk at: e-mail at [helpdesk@alaska.edu](mailto:helpdesk@alaska.edu), phone: 450.8300 (in the Fairbanks area) or 1.800.478.8226 (outside of Fairbanks)

#### Effective communication

Students who have difficulties with oral presentations and/or writing are strongly encouraged to get help from [UAF Department of Communication](#)

## Unit schedule and òrm due times

This schedule lists what will be covered by the class and applications, and which units have to be completed in which week. Note that



